
**Public-Private Partnerships: A Governance Analysis of the Durban Water
Reclamation Plant**

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Abstract

Public-Private partnerships (PPPs) are considered as a model of good governance. PPPs have assisted in delivering services and improving infrastructure facilities worldwide. PPPs have been understood in theoretical and practical terms both globally and in South Africa. This study established the rationale for PPPs in general as well as in South Africa. It describes the different forms and types of PPPs and provides examples of PPPs.

The legislative and policy framework for PPPs in South Africa is presented and analyzed. This study focuses on PPPs in the water sector. Particular attention is paid to the Durban Water Reclamation Plant which is a PPP in the eThekweni metropolitan municipality in KwaZulu-Natal and is the case study of this study. The study examines how the Durban Water Reclamation Plant has governed, its strengths and challenges and what lessons can be learnt. The study concludes that this is a successful PPP because it aims and outcomes have been beneficial to all the partners concerned, and has serving the socio-economic needs of the region it is serving.

List of Acronyms

BOOT	Build-Operate-Own-Transfer
BOT	Build-Own-Transfer
COD	Calculated Oxygen Demand
DBFOT	Design-Build-Finance-Own-Transfer
DBSA	Development Bank of South Africa
DWA (F)	Department of Water Affairs (and Forestry)
DWRP	Durban Water Recycling Plant
DWSS	Durban Water and Sanitation Services
ECA	Europe and Central Asia
ECA	Economic Commission for Africa
EIA	Environmental Impact Assessment
ETW	EThekweni Treatment Water
EWS	EThekweni Water and Sanitation
EWS	EThekweni Water Services
FBW	Free Basic Water Policy
GAC	Granular Activated Carbon
GDP	Gross Domestic Product
GoA	Government of Armenia
IBRD	International Bank for Reconstruction and Development
IDP	Integrated Development Plan
MFMA	Municipal Finance Management Act
MSA	Municipal Systems Act
MSP	Municipal Service Partnership
NDP	National Development Plan

NGO	Non-Governmental Organization
NPM	New Public Management
NWA	National Water Act
PAC	Poly Aluminum Chloride
PPPs	Public Private Partnership(s)
PRMA	Public Finance Management Act
SADC	South African Development Corporation
SAICE	South African Institute of Civil Engineering
SEEG	<i>Société d'Énergie et d'Eau du Gabon</i>
USAID	United States Agency for International Development
VIP	Ventilated Improved Pit
VPS	Virginia Pipeline Scheme
WAJ	Water Authority of Jordan
WRSV	Water Reticulation Service Virginia
WSA	Water Services Act
WSA	Water Services Authority
SWTW	Southern Wastewater Treatment Works
YWSE	Yerevan Water and Sewerage Enterprise

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CHAPTER ONE

Introduction to the Study

1.1 Background

This is a study in governance in post-Apartheid South Africa and looks at the nature of PPPs and the legislative framework in which they operate. The government has identified PPPs as a core vehicle for service delivery and infrastructure development in its National Development Plan 2030, but only a few policies have been drafted to guide the establishment and governance of PPPs. The objective of this research study is to identify and critically analyze the role PPPs can play in service delivery in South Africa, especially in the treatment of wastewater sector.

The rationale for the study emanates from the government's recent National Development Plan 2030 (prepared by the National Planning Commission to Parliament in 2011). This Plan (hereafter referred to as the NDP) identifies PPPs as a critical action in pursuing the development needs of South Africa. According to the NDP the expansion of public infrastructure is high on the developmental agenda and a budget priority. Strategic critical action 7 of the NDP identifies public infrastructure investment at 10 percent of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans and focused on transport, energy and water. (National Planning Commission: 2011: 24). In other words, it acknowledges the need for infrastructure and identifies PPPs as one way to fund this.

PPPs in South Africa are defined as *'a contract between a government institution and private party, where: the private party performs an institutional function and/or uses state property in terms of output specifications; substantial project risk is transferred to the private party; the private party benefits through unitary payments from government budgets and/or user fees.'* (PPP Unit, 2007: 5). Their application ranges from short-term contracts, outsourcing to large-scale long-term concessions.

The case study will analyze the Durban Water Recycling Plant concession agreement. This is a PPP in the city of Durban (in the eThekweni metropolitan municipality) which has been part of the city's water recycling project since 2001. The eThekweni metropolitan municipality identified the challenges of treating wastewater as a growing public policy concern in 1993 and

called for private sector involvement (eThekweni Municipality, 2011). The Durban Water Recycling Plant was commissioned through a PPP arrangement in 2001 when the municipality entered into a 20 year concession contract agreement with private sector partners to recycle water (Gisclon, *et al*, 2002).

This research study aims to investigate this particular PPP. It will identify the governance strengths and challenges associated with this PPP and how the eThekweni metropolitan municipality managed the overall PPP process since its inception.

1.2 Significance of the Study

As stated above, this research study focuses in Durban Water Recycling Plant PPP. The rationale is to offer important findings for public policy intervention in relation to the delivery of public services and infrastructure. The reason for choosing this PPP is because it is a PPP that has been operational for almost fourteen years and provides a relevant local case study.

A preliminary literature review has indicated that the conclusions reached in various studies on PPPs in the water sector are mixed. Tati (2005) conducted a study on the provision of water through PPPs in Congo-Brazzaville and concluded that the success of PPPs was depended on the extent of risk transfer, competition, and contestability and how this was managed by government.

Many local studies report negative results. The KwaZulu-Natal Department of Economic Development (2005) reported that failed PPP projects such as the Dolphin Coast and Nelspruit (both water-related projects) were attributed to governance problems. These municipalities did not foresee and could not manage the eminent opposition from unions and consumers.

Robbins in 2004 conducted his research in the ILembe District municipality (South Africa) and its utilization of PPPs in the water sector, and concluded that it was an outright failure. His conclusion was open-ended: those PPPs in the coming years “will predict whether or not the partnership creates new opportunities, especially in terms of rising levels of the poor or delivers the minimum in terms of contract obligations” (2004: 46).

1.3 Research Problem and Objectives

Literature indicates that South Africa is a water-stressed country (Larson, 2010). Therefore, new ways of managing and preserving water are needed in South Africa. The city of Durban took an

initiative to recycle wastewater in the early 1990s through a water recycling programme. The commission of a PPP in 2001 extended their recycling programme. This is the focus of this study.

The key questions pertain to the PPPs set up for the treatment of wastewater in the eThekweni metropolitan municipality. These are:

- What is the legislative policy framework for PPPs in a post-Apartheid South Africa?
- What is the background to the Durban Water Reclamation Plant PPP?
- What are the structures of governance that have been set up to oversee the management of the Durban Water Reclamation Plant PPP?
- What have been some of the governance challenges facing Durban Water Reclamation Plant PPP and how have these been managed?
- What critiques has been leveled against the Durban Water Reclamation Plant PPP?
- What advantages/benefits have been derived from Durban Water Reclamation Plant PPP?
- What lessons (if any) can be learnt from the Durban Water Reclamation Plant PPP?

1.4 Research problem and objectives: Broader issues to be investigated

The broader research questions pertain to PPPs in general. It aims to provide an understanding of the origins and rationale for PPPs as a governance approach, and its legal standing in South Africa. The broad questions guiding the project are:

- Where do PPPs originate from?
- What is the rationale for the establishment of PPPs?
- What types of PPPs are there and how are they implemented?
- What are the alleged benefits of PPPs?
- What are the critiques leveled at PPPs?

This study aims to explore the origins and developments of Public Private Partnerships (PPPs) in the delivery of public services and infrastructure - both in general, as well as in the South African context. There is no specific theory on PPPs. However a conceptual framework will be established based on the literature on governance. Governance argues Abdellatif (2003: 5)

“encompasses the functioning and capability of the public sector, as well as the rules and institutions that create the framework for the conduct of both public and private business, including accountability for economic and financial performance, and regulatory frameworks relating to companies, corporations, and partnerships”.

1.5 Research Methodology and methods

This is a desktop study and does not entail any fieldwork. This research will consist of (i) a literature review and (ii) a case study on the Durban Water Recycling PPP.

The study will adopt a predominantly descriptive research approach. Hero (1986: 659) recommends such an approach when studying urban governance. He argues that descriptive research can provide revealing and significant knowledge about urban bureaucratic decision processes and urban governance in general. He reveals that the findings of comprehensive descriptive studies have produced meaningful insight into issues of governance. According to Schlager (1999: 293) in policymaking processes, the emphasis is much more on the ‘unfolding’ than on the authoritative decision, with attention devoted to the structure, context, constraints and dynamics of the process, as well as the actual decisions and events that occur.

Data will be gathered from primary and secondary sources such as books, journals, government reports and reports written by the respective PPP members (Namely, Mondi Paper Company, Vivendi Water Systems, Khulani Water Limited, Marubeni Europe, Umgeni Water and Zetachem (Pty) Limited). Primary documents such as national and local government legislation and policy documents pertaining to water policy will be consulted to establish the policy framework. Thereafter, the reports on the Durban Water Recycling Project PPP will be analysed adopting a content analysis approach. This is a quantitative research meaning relevant themes will be gathered from literature. These documents are available on the eThekweni website; the National Department of Water Affairs website; and the Water Research Council database.

Articles and research reports on the provision and treatment of water services through PPPs will be analyzed extensively. The respective partners of the Durban Water Reclamation PPP have produced reports independently of the eThekweni metropolitan municipality. These will also be analysed adopting a content analysis approach.

1.6 Structure of dissertation

This dissertation will be structured in five chapters as follows:

Chapter 1: Introduction.

This chapter will present Public-Private Partnerships (PPPs). It will conceptualize PPPs from a theoretical perspective. The chapter will also elaborate on the research problem, define research questions, provides the justification of the study, highlights on the research approach of the dissertation, and elaborate on the contribution to be made by this research.

Chapter 2: Conceptual framework of PPPs.

This chapter will expand on the concept of public-private partnerships. Different definitions of PPPs will be discussed, origins of PPPs, policy framework, benefits and challenges for PPPs.

Chapter 3: PPPs in South Africa.

This chapter will present a literature review on PPPs in South Africa. It will present the origins of PPPs in South Africa, policy framework for PPPs, challenges and benefits for PPPs.

Chapter 4: The Case Study: The Durban Water Reclamation Plant PPP.

This chapter is the case study component of the study and will present an analysis of the governance issues pertaining to the Durban Water Reclamation Plant PPP.

Chapter 5: Conclusion.

This chapter will present the overall findings and analysis of the study on PPPs.

1.7 Conclusion

This first chapter has outlined the background of the study. The chapter has explained the research problem of the study and the rationale of the study. The methodology that will be used for the research has been constructed and explained extensively. The next chapter presents a conceptual framework on PPPs.

CHAPTER TWO

A Conceptual Framework for Analyzing Public Private Partnerships

2.1 Introduction

The aim of this chapter is to provide a conceptual framework for this study. It will provide an understanding of the concept of public-private partnerships (PPPs), the origins of PPPs, its legal framework, the benefits and limitations of PPPs. The chapter will end by discussing some example of wastewater management PPP in places such as Armenia, Adelaide (Australia), Gabon, Canada and the Middle East.

2.1.1 What are Public-Private Partnerships?

The field of policy is ever growing field. Policy implementation is essential to public management (Brinkerhoff, 2002). Therefore, there are mechanisms and processing that are important in managing policy, especially in the rising new forms like Public-Private Partnerships (PPPs) as part of the state capacity for managing policy. There are quite a number of definitions of what are public-private partnerships and in this section some of the definitions will be explored extensively. PPPs are defined into context of what is being dealt with and definitions vary according to situational context. Literature points out that PPPs are difficult to define. There is no international or universal definition of what are Public-Private Partnerships. The term is applied to a wide range of relationships.

The rising reputation of New Public Management (NPM) and governance has resulted in a number of new public service delivery structures like Public-Private Partnerships (Rayners, 2012). Public Private Partnerships are defined as “cooperation of some sort if durability between public and private actors in which they jointly develop product and services and share risks, costs, and resources which are connected with these products” (Van Ham and Koppenjan 2001: 598 in Hodge and Greve, 2007:546). According to Ferlie, *et al*, (2005:347) Public-Private Partnerships “combine the resources of government with those of private agents (businesses or not-for-profit bodies) in order to deliver societal goals” . Partnerships take a form of contracting out of services, business management of public utilities, and the design of hybrid organizations for risk sharing and co-production between government and private agents (Ferlie, *et al*, 2005).

A PPP is “an institutional and contractual partnership arrangement between government and a private sector operator to deliver a good or service to the public, with a distinctive elements” (Fourie and Burger, 2000 in Burger 2006). One other simplified definition for PPPs is by Bagal (2008:24) that PPPs are “cooperative arrangements between private and public sector organizations for providing infrastructure services and products to the public where the parties agree to share duties, responsibilities, costs, profits and risks; this is attained through various agreements and covenants and involves a large number of participants such as projects sponsors, investors, operators, insurers, suppliers, contractors, and sub-contractors” . PPPs are “a long term contract between a public-sector party and private-sector party for the design, construction, financing and operation of public infrastructure by the private sector party” (Yascom, 2007:3).

Partnerships according to the Economic Commission for Africa (2005:3) are defined as “the combination of a public need with private capacity and resources to create a market opportunity through which the public need is met and a profit is made” . Basically partnerships are a combination of two or more partners. Public-Private Partnerships are based on contractual arrangements including “service contracts, management contracts, lease, operations and maintenance concessions, capital investments to divesture and asset ownership, through which variable levels of efficiency, effectiveness, responsiveness and adequacy of public services” (Economic Commission for Africa, 2005: 3). In most cases partnerships happen in a form of services or sector specific.

According to the World Bank, PPPs are defined as “a long-term contract between a private party and a government agency, for providing a public asset or service, in which the private party bears significant risk and management responsibility” (2012:11). PPPs offer a new assets and services and existing assets in which a private party is paid by service users and those whereby the government agency makes all or some payments (World Bank, 2012). PPPs are also provided for public interest to serve their needs. In many cases the government provides funding for projects, programs or policies, whereas the private sector is responsible for taking risk and management responsibility. Teisman and Klijn define PPPs as “new governance scheme, which aim to manage the increased interdependencies between all kinds of societal actors and can be linked to forms of governance” (2002:198).

In the context of project infrastructure development, PPP is defined as “any contractual or legal relationship between public and private entities aimed at improving and/or expanding infrastructure services, but excluding public works contracts” (Delmon, 2011:2). Akintoye (2004) argues for the same definition of what a PPP as he defined as “any contractual arrangement between a public sector agency and a for-profit private sector concern, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure”. Also, PPP “is an arrangement for the public sector to deliver infrastructure services for the public sector or to assist the public in its task of delivering infrastructure services to the public” (Delmon, 2011:7). Furthermore, public services provider and private involvement combines an essential part of successful service delivery, be it in a form of construction contracts, service agreements, and delivery of goods or joint ventures (Delmon, 2011). PPP in infrastructure is used as a tool to assist in increasing investment infrastructure services and to improve efficiency. Linder (1999) cited in Okeyo (2013:25) sees PPP as “a new expression in the language of public management, one intended to include older, established procedures of involvement of private organization in the delivery of public services”.

According to Regan (2005) in Ndandiko (2006:695) PPPs refer to the “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” . Actually, the private partner becomes the long-term provider of services while government becomes the purchaser of the services. When appropriate allocation of resources, risks and rewards are clearly defined than partnerships are easily formed. Through the process of contracting out, PPPs better deliver public services ranging from direct provision by a public sector entity to outright privatization, where the government transfers all responsibilities, risks and rewards for service delivery to the private sector and the role of government moves from being a provider to an enabler and regulator (Ndandiko, 2006).

Witters, *et al*, (2012:81) describe PPPs as “the relationship in which public and private resources are blended to achieve a goal or set of goals judged to be mutually beneficial both to the private entity and to the public”. PPPs are said to be gaining momentum as the time progresses and are becoming ‘development approach for our time’ . Brinkerhoff and Crosby defines partnerships as “cross-sectorial (public and private) interactions whose purpose is to achieve convergent

objectives through the combined efforts of both sets of actors, but where the respective roles and responsibilities of the actors involved remain distinct” (2002:86). According to Witters, et al, (2012), economic environment defines PPPs as “contractual agreement between a public agency or public-sector authority and a private-sector entity that allow for greater private participation in the delivery of public services or in developing an environment that improves the quality of life for the general public”. Full commitment from all partners is essential for understanding of the partnership.

There are two dominant schools of thought on PPPs. The first group led by Viallancourt Rousenau (1999) who view PPPs as institutional and financial arrangement arguing that “both the private and public sectors have specific qualities which when combined, result in better services/products and also that synergy if effectiveness of the state bureaucracy and the efficiency of the private sector shall yield improved quality of public services and goods by infusing market principles” (Okeyo, 2013:26). The second school of thought led by van Ham and Koppenjan views PPPs as “a cooperation of some sort of durability between public and private actors in which they jointly develop products and services, share risks, costs and resources which are connected with these products” (Okeyo, 2013:26).

There is a group of scholars who view PPPs as “language game”. By language game Linder (1999), Savas (2000) and Teisman (2002) means PPPs are designed to “cloud” other strategies and purposes. Therefore, the purpose of PPPs seems to be “privatization and encouragement of private providers to supply public services at the expense of public organizations themselves” (Okeyo, 2013:26). The main argument that Savas (2000) makes is that contracting out, privatization, alternative delivery systems and public-private partnerships calls more people and organizations to join together in the debate and allows private organizations to get a market share of public service provision (Okeyo, 2013). Furthermore, Teisman and Klijn (2002) and Savas (2000), share the same thought about what is PPP. Some scholars use privatization, commercialization and liberalization substitutable to mean public-private partnership yet these are different concept all together.

Nelson has a different view on what are PPPs in that PPPs are voluntary agreement. Nelson’s definition states that PPPs are “voluntary and collaborative agreement in which all participants

work together to achieve a common purpose or undertake a specific task and to share risks, responsibilities, resources, competencies and benefits” (2002:47). Furthermore, PPPs refers to “voluntary, horizontally structured and relatively institutionalized arrangements that bring together actors from distinct sectors through an actual partnering arrangement rather than only more informal interactions” (Kaul, 2006 cited in Homkes, 2011:33). The European Commission defines PPP as “the transfer to the private sector of investment projects that traditionally have been executed or financed by the public sector” (2003:96). The emphasis of PPPs is on service delivery, private sector investment and risk transferred from the government to the Private sector (IMF, 2004).

There are situational variables that influence public-private partnerships. Situational variables influence PPPs in a number of ways for example whether a state is a democratic or authoritarian regime to promote or hinder partnerships (Brinkerhoff and Crosby, 2002). The second and important variable is the level of trust as it influences the willingness to initiate joint activities and to work together over time (Brinkerhoff, 2002). The third variable is legal and regulation framework, it gives ability to government to enter into partnership with private sector in a democratic regime but nondemocratic regime is most likely to have restrictive regulations for partnerships. Lastly, the nature of the policy to be implemented influences the characteristics of the policy that the partnership deals with (Brinkerhoff and Crosby, 2002). Linder (2000) attest that the meaning of PPPs can serve as a reference points that is not mutually exclusive, definitional categories that might serve some taxonomic purpose, but rather are simple meaning attached to the use of the term by certain actors in making claims for its application or adoption. PPPs “are accommodationist; they hold back the specter of whole-sale divestiture and in exchange, promise lucrative collaboration with the state” (Linder, 2000:25).

PPPs as Policy Networks

Public-Private Partnerships are not the same as policy networks. For policy networks are “more or less stable patterns of social relations between interdependent actors, which take shape around policy problems and/or policy programmes” (Kickert, *et al*, 1997:6). From this definition we can see that policy networks are made of interdependencies compared to partnerships which are formed by contracting-out of resources. Interdependency is a key word in the network approach.

Policy network actors “deal with public problems and involve interactions between governmental agencies, quasi-governmental bodies and private organizations and distribution of resources over various actors” (Kickert, *et al*, 1997:6).

PPPs are important tools for improved service delivery (Teisman and Klijn, 2002) whereas policy networks develop around policy problems and resources which are needed to deal with policy problems (Kickert, *et al*, 2002). Policy networks are not always formal, however PPPs are. Unlike PPPs, policy networks are not dependent upon a central authority though they too impose interdependency (Brinkerhoff and Brinkerhoff, 1999).

Teisman and Klijn (2002) state that partnerships and public private partnerships can be viewed as new governance schemes which aim to manage the increased interdependencies between all kinds of societal actors. Partnerships and networks form “a link of governance where public actors take their interdependencies with other actors into account and try to solve governance problems through cooperation rather through central steering and control” (Susskind and Cruikshank 1987; Sinning, 1995; McCarthy 1998, cited in Teisman and Klijn, 2002:198). Also PPPs are a way to rule the complex relations and interactions in a modern network society (Teisman and Klijn, 2002). PPPs and networks share common characteristics, but are not synonymous and do not mean the same thing.

2.1.2 The Origins of Public-Private Partnerships

The origin of the term public-private partnerships varies according to countries and projects to be implemented. In Europe, France, PPPs date back in 1400s. The history indicates that as early as 1438, French nobleman Luis de Bernam was given a river concession to charge the fees for goods transported on the Rhine and in 1792 the same concession was granted to brother Perrier for water supply in Paris (ppp4krakow, 2012). Noblemen were granted permission to build bridges water channel, roads and railways. Partnerships were called public works concession in France during 1400s. According to Cowie (1996) cited in Hodge, *at el*, (2010:47) “since the seventeenth century, many canals and bridges have been built in France through the government granting concessions to private firms and this continues for much transport infrastructure”. Furthermore, Lorrain in Hodge (2010:47), note that in France “many more public services such as water, sewage, refuse collection and treatment, urban transport, mass housing, and facilities

for culture, sport and social affairs have been operated by private companies since nineteenth century”.

Ever since seventeenth to nineteenth century there were many participants who entered into construction of infrastructure facilities in Europe and later in America, China and Japan (ppp4krawon, 2012). One of the first historical records of a significant partnership between a government and the private sector entity in North America dates back “to 1742 when Benjamin Franklin started the American Philosophical Society of Philadelphia together with Pennsylvania House of Representatives to fund building of the University of Pennsylvania, the first medical school in English Colonies” (Cellucci, 2012:5). In Poland, PPPs in infrastructure sector dates back in the times of partitions of Poland when railway lines were built under the concessions in 1921 (Ppp4krakow, 2012).

PPPs were largely present between the public and private sector in collaborative funding activities for educational programmes and came into wider use in the 1960s to refer to public-private joint ventures for renewal in (Yascom, 2007). According to Ferlie, *et al*, “the roots of PPPs go back to nineteenth-century relationships between government and private actors that in some nations were dislocated by the growth of welfare state bureaucracies during the twentieth century” (2005:362).

“PPPs in the United States were very popular by the 19th Century. Many roads and bridges were privately owned and operated in New York by the Manhattan Company, known today as Chase Manhattan” (Shanker and Rodman, 1996:103). PPPs advanced in recent years from early models of contracting out municipal services to encompass longer term possibilities based on relational contracting (Ferlie, *et al*, 2005). The evidence of emergence of PPPs is seen from the separation of changing mode of governance from medium term consequences arising from the new institutional settlement (Ferlie, *et al*, 2005). PPPs are also used to publicly funded provision of social services by non-public-sector bodies, often from the voluntary (not for profit sector) as well as public funding of private-sector research and development in the fields such as technology (Yascom, 2007).

Public-Private Partnerships as a mode of governance call for a shift from government-only to a governance approach that allows for governance to be more inclusive and collaborative with

other sectors, such as the private and civic sectors. PPPs primary aim is to establish a partnership between the public sector and the private sector to solve a particular public policy problem. Table 2.1 below summarises some of the most prevalent types of PPP arrangements.

Table 2.1: Public Service Delivery Arrangements

Type	Definition	Responsibilities
Contract Services	Private partner contracted to provide specific municipal service	Financing: public Design: Public-private Construction: public-private Ownership: public O&M: private
Turnkey projects	Private partner designs, constructs and operates an environmental facility owned by public sector	Financing: public Design: private Construction: private Ownership: public O&M: private
Developer financing	Private party (usually developer) finances construction or expansion of environmental facility in return for right to build houses, stores, or industrial facilities.	Financing: private Design: either Construction: either Ownership: either O&M: either
Merchant facilities	Private company makes a business decision to provide an environmental service in anticipation of profit	Financing: private Design: private Construction: private Ownership: private O&M: private

Source: USEPA, May 1990 in Shanker and Rodman 1996

Each PPP, regardless of the type, is delineated and formalized through a contract. Table 2.2 below describes the most prevalent types of contracts adopted.

Table 2.2: Types of Contracts

Type	Description
Concession model	Private company contracts to finance, build, and operate systems in return for long-term operating contracts (concessions) of 25-30 years
Affirmage contract (Franchise-lease)	Municipality finances and builds facility and contracts to private companies for O&M
Design-build	Municipality provides financing and private partner designs and builds facility
Design-build-operate	Municipality provides financing and private partner designs, builds, and operates
Private operations	Municipalities award contracts for full or partial O&M

Source: Shanker and Rodman, 1996 in Journal AWWA

Table 2.2 highlights the different contracts, but the list is by no means all-inclusive. Concession model and affirmage contract (franchise-lease) are common in Europe, Australia and South America (Shanker and Rodman, 1996). Design-build, design-build-operate and operations were successful implemented in the above countries.

Table 2.3 below summarises the most prevalent PPP contract options adopted (globally) in the water and sanitation policy sector. It further identifies which sector is normally allocated the responsibility for, among others tasks; its operations and maintenance, capital investment, and commercial risk. As one can notice, these are either the exclusive domain of the public sector, the private sector, or are shared by both sectors. The details of such arrangements are detailed in PPP contracts. Table 2.3 also details the average duration of the type of PPP contract arrangement. One can see that PPPs can be short-term to long-term arrangements.

Table 2.3: Allocation of key responsibilities under the various options for private sector participation

Option	Asset ownership	Operations and maintenance	Capital investment	Commercial risk	Duration
Service contract	Public	Public and private	Public	Public	1-2 years
Management contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
SOT/BOO	Private	Private	Private	Private	20-30 years
Divestiture	Private and private and public	Private	Private	Private	Indefinite (may be limited by license)

Source: World Bank, 1997 "Toolkits for Private Participation in Water and Sanitation" .

The partnership arrangements are not limited to one between the government and a private business entity. The different types of contracts can also be entered into between government and small-scale independent providers, nongovernmental organisations (NGOs) (Economic Commission for Africa, 2005). Table 2.3 illustrates that contractual arrangements can start from “service contracts, management contracts, leases, operations and maintenance concessions, capital investments to divesture and asset ownership, through which variable levels of partnership are established to improve levels of efficiency, effectiveness, responsiveness and adequacy of public services” (Economic Commission for Africa, 2005:3).

2.1.3 The Legal and Policy Framework for PPPs

Public-Private Partnerships do not operate in a vacuum, but are limited and must prescribe to context-specific laws and regulations. PPP laws are considered necessary to manage constraints on government contracting and finance by other laws. The laws and regulations in PPPs have control on whether or how PPPs can be implemented (IBRD, 2012). Laws and regulations are used to set up rules as to how PPPs will be developed and implemented. These laws and regulations are specific to legislation, public financial management laws and regulations, and sector-specific laws and regulations. The requirement for a PPP legal framework to work is to allow the government to enter into PPP contracts. The civil law countries on the other hand require specific laws that are used to empower governments to enter PPP contracts.

According to International Bank for Reconstruction and Development (IBRD) (2012:114-115) the following are laws and regulations that can be applied to PPPs:

- **Administrative law** - in many civil law countries, government agencies are governed by administrative laws that govern their functions and decision-making process.
- **Procurement law** – the transaction process for a PPP must typically comply with public procurement law and regulations, unless PPPs are specifically exempt.
- **Public financial management law** – institutional responsibilities, processes, and rules established in public financial management laws and regulations can contribute to the PPP framework. For example this could include project approval requirements, fiscal limits, budgeting processes, and reporting requirements.
- **Sector laws and regulatory frameworks** – PPPs are often implemented in sectors that are already governed by sector-level law and regulatory frameworks. These may constrain the government’s ability to contract with the private sector, or provide rules for doing so.
- **Other laws affecting the operation of private firms** – also apply to PPP companies, and should be taken into consideration when defining PPP projects and processes. These include:
 - Environmental law and regulations
 - Laws and regulations governing land acquisition and ownership

-
- Licensing requirements, particularly for international firms
 - Tax rules
 - Employment law

Countries use laws to empower government to enter into PPP contracts and to resolve other limitations in existing administrative laws which constrain how PPP contracts can be structured and managed. Common countries do not use law to legally allow the government to enter into PPP contracts but laws are used to deal with inconsistencies between the proposed PPP policy and existing laws (IBRD, 2012). According to the IBRD (2012:116), PPP laws are there “to limit the discretion of the executive branch of government in implementing PPPs and to bolster accountability and credibility of the government’s commitment to PPPs, on the basis that a policy may not be as strictly followed as a law”.

The private sector is mainly concerned about examining the legal framework and its ability to ensure the effectiveness of long-term PPP contracts that may be needed to charge and collect user fees under a concession PPP (IBRD, 2009). Specific laws may be required to permit public sector to contract with private bodies for the delivery of services till then provided by the state. Some legal controls include Water Resources Act, approval by the Public and Environmental Health Services and approval by the Environmental Protection Authority (EPA) (Keremane, 2011:43).

According to IBRD (2009:14-15), the private sector may ask the following key questions of the law or the PPP contract itself:

- Does the public sector have a robust, forward-planning program and allocation process to ensure that payments can be made when due, such as obligations against future budgets?
- Is combined procurement of construction and long-term operation and maintenance permitted (or do these phases have to be procured under separate contracts)?
- What are the investor’s rights (what happened if a contract is terminated early)?
- How will repatriation of profits be treated for overseas investors, and what restrictions, if any, will there be on the use of expatriate personnel?
- What are the lenders rights (for example, the lenders ability to take security over the contract-lenders do not usually have security over the underlying infrastructure asset, as

this ultimately belongs to the public sector- or to take over management of the asset when enforcing their security)?

- How will contract disputes be resolved, and when rights and obligations are required of either party in the event that the project does not go according to plans?
- How will payments be taxed under the project (for example, sales or value-added taxes on construction costs or service payments)?
- What forms of government support are likely to be available for certain risks?
- How will changes to the contract be handled, and what compensation mechanisms will be used?
- Are unsolicited proposals permitted, and, if so, how will they be treated?

These laws are covered in the general administrative law or specific contracts of the projects. These laws have benefits when adopting legal solutions used in markets with successfully operating PPP programs. A balance between a fixed legal framework and a flexible legal framework is effective in responding to best practice over time (IBRD, 2009). IBRD (2009:15) makes a suggestion that “it may be preferable to set out core principles in framework legislation and use administrative rules to set out more detailed law that may respond in a logical and consultative way over time to inevitable changes in changes in policy and the market” .

Public-private partnerships that are likely to survive are those that establish and clarify the policy framework as the private sector needs to understand the drivers that lie behind the projects, establish a clear framework as PPPs depend heavily on contracts that are effective and enforceable. PPPs should ensure consistency of policy and legal framework that reduces uncertainty for investors. According to Wilhelm, *et al*, (2009) the government must show a clear and long term political commitment to the use of PPP. There are ways in which to implement legal framework. Firstly, it could be by involving many stakeholders. Secondly, by allocating wide range of risks associated with project which has to be allocated properly and thirdly, the nature of PPP scheme meaning the arrangements must be flexible and responsive to circumstances changing over time. PPP concept needs to be well defined in the country’s constitution in order to be well understood (Wilhelm, *et al*, 2009).

2.1.4 Benefits of Public Private Partnerships

There are benefits associated with water service PPPs. PPPs can improve the speed and efficiency of procurement such as design, construction and commissioning of water and sewer infrastructure compared to the traditional model of separate design and construction phasing (The Canadian Council for PPPs, 2001). PPPs also provide additional sources of finance where the government is unable to increase public debt to meet investment needs and the private sector can supply capital through PPP arrangements without impacting municipal balance sheet (The Canadian Council for PPPs, 2001). Using exactly the same infrastructure, “often with the same staff, the private sector has proven its ability to operate more efficiently” (The Canadian Council for PPPs, 2001:15). Also, efficiency is significant for both PPPs partners in a sense that “public sector frees up resources that can be reinvented in water and sewer infrastructure, used to lower user fees for water and sewage services, or used for other municipal purposes as the case may be no matter where savings are directed, the result is greater value for water users and taxpayers” (The Canadian Council for PPPs, 2001:15).

Highly qualified staff builds competitive advantage, develop efficiencies and manage corporate risk to private sector water companies by meeting government standards in the minimum level of acceptability for private sector (The Canadian Council for PPPs, 2001). The purpose of transferring risk to the public sector is to “allocate each type of risk to the party that is best equipped to mitigate it or to the party best qualified to undertake the activity which minimizes the overall risk and cost for water services, benefiting all parties” (The Canadian Council for PPPs, 2001:16). PPPs create an extended level of monitoring as municipal governments stop being water system operators and become contract managers when regulations are enforced to improve compliance. PPPs also, “leave full control over water user rates in the hands of the municipality (also in the case of full privatization), and rates or subsidies may need to rise if new investment is required or operating standards are upgraded or they may fall if efficiency gains are not needed for new investment” (The Canadian Council for PPPs, 2001:19).

Browne, *et al*, 2003 in Ndandiko (2006:695) states that PPPs can be more efficient than traditional government service delivery because the private sector partner makes better use of resources through operational efficiency, market related incentives and competition. They

further argue that effective partnerships with the private sector are a way of integrating the public and private sector and often bring the benefit of private sector experience to areas under traditional public sector management; and the ability to explicitly design PPPs to be accountable for the delivery they attain. (Browne, *et al*, 2003 in Ndandiko 2006:695). Motives and benefits of PPPs bring goal compatibility which shares common goals between public and private sector in order to reduce risk and increase certainty; “capacity of the partners to execute their roles; the credibility and transparency of the procurement process; and greater education and sensitization of the stakeholders” (Ndandiko, 2006:697). Benefits for PPPs have also been granted to its ability to promote physical accountability, relief from complex tasks, community ownership and reduced supervision costs (Ndandiko, 2006).

Abedin (2012) classified a number of benefits of PPPs for government and for the private sector alike. The benefit for government according to Abedin (2012:17) provides the following opportunities:

- Improve service delivery to allow public and private sectors to what they are best at.
- Improve cost-effectiveness that can be used to fund other needed services.
- Increase investment in public infrastructure to reduce government’ s capital costs, helping to bridge the gap between the need for infrastructure and the provinces financial capacity.
- Reduce public sector risk by passing to the private partner those risks that can be better managed by the private partner.
- Deliver capital projects faster through utilizing private partners increased flexibility and access to resources.
- Improve budget certainty passes risk to the private sector minimizes the potential for government cost to move away from unforeseen circumstances during project development or service delivery.
- Make better use of assets that result in higher levels of service, reduced occupancy for the public sector and greater accessibility.

According to Abedin (2012:17) benefits of PPPs for the private sector are:

- Access to secure long term investment opportunities.
- Payment through a contracted fee for service which may be secure for as long as 50 years or more.
- Achieving efficiencies based on managerial, technical and financial and innovation capabilities.
- Expand PPPs capacity and expertise that can help creating additional business opportunities.

PPPs have specific objectives set within specific timeframes. Time overruns cost money. This argues Jakutyte (2012) better ensures that project delivery remains on time and within budget. PPPs have the capacity to extend the costs of large investments over the lifespan of the asset for the public sector. This advantage enables “large investment costs [to be] spread out and private funds are considered as the new financing opportunities for the government” but this is not always the case since government can be incentivised to prove better value for money for a PPP project only (Meidute and Paliulis, 2011 cited in Jakutyte, 2012:27). PPPs brings opportunities for the private sector to be part of the new market and private sector gets support from the government that assist in gathering the funds required or otherwise private sector will not have opportunity to participate in the market (Jakutyte, 2012).

2.1.5 Limitations of Public Private Partnerships

The limitations of PPPs in developing countries are that they are faced with economic depression and a lack the resources to effectively apply a PPP (Ndandiko, 2006). Moreover, developing countries have a poor economic resource base and an inadequate regulatory framework. Larbi (1997) also points out that private sector in developing countries is still young and lacks adequate financial, technical and managerial capabilities. Limitations in developing countries go with inadequate regulatory frameworks and an impoverished public or private sectors. Larbi ask questions about what PPPs can do: “would PPP really provide ‘value-for-money’ and are they cost-effective? Would such partnerships enhance the quality of public services and can they

affect good governance in public procurement? How should they be implemented in order to optimize (Larbi, 1997)?

Large bidding costs and contractual costs of PPP projects are drawbacks and explain why private parties are often unwilling to invest in the bidding process (Jakutyte, 2012). Jakutyte (2012) views PPP projects as highly complicated since more than two parties are involved such as public, private, civil society and banking sectors which may contradict aims and takes some time to reach a unified agreement. As most definitions of PPPs state that PPPs transfer risk to private sector, so if the private sector get broke than the government needs to take responsibility of that by dealing with the consequences and try to find ways of delivering services to the public (Jakutyte, 2012). Sometimes PPPs require specific projects that are complex and need specific private partner knowledge, skills and experiences which can be a disadvantage.

2.2 PPPs in Wastewater Management

Water is a basic need to humankind. One of the greatest challenges in twenty first century is provision of water to the growing population and balancing water demands UNESCO (2006) in Keremane (2011). The demand for providing freshwater to satisfy the needs of the growing population depends on “uncertainties as to the availability of supplies, the high costs of developing additional water supplies, the vulnerability of the resources and the problem of restoring and protecting valued surface and ground resources, the importance of reliable supplier of high-quality water for human and environmental health and economic development and the shortcomings of our institutions for allocating scarce supplies in response to changing supply and demand conditions” (Keremane and McKay, 2009 in Keremane, 2011:34-35).

The challenge is to provide quality, quantity and sustainable water around the world. The government alone and private sector alone cannot supply freshwater to all humankind but through the form of partnerships it is possible. There is a greater need now than before for wastewater management and water recycling, reuse and reclamation. Any government around the world has a responsibility to provide public services and infrastructure to the increasing population pressure, urbanization, and other development trends (Keremane, 2011). But because

the government alone cannot provide and satisfy all human basic needs due to lack of funds, corruption and inefficiency, the public-private partnerships have been called to assist in providing public services and infrastructure. Collective action has become an immediate necessity rather than a choice. This section of the chapter looks at examples in different areas of the world where PPPs have been utilized to address problems of access to clean water.

2.2.1 Adelaide: The Virginia Pipeline Scheme

The Virginia Pipeline Scheme (VPS) operates in the Northern Adelaide plains of South Australia (Keremane, 2011). The problem was that the horticulture industry overused ground fresh water resources for irrigation water supply. Therefore, the scheme was built on the build-own-operate-transfer with the aim of treatment plant. The scheme raised concerns about environmental damages caused by discharge of nutrient-rich effluents into the ocean, government initiatives like Build Better Cities Environment Improvement Program. The private consortium, Water Reticulation Service Virginia (WRSV) was given a responsibility for building and operating the Virginia pipeline scheme, until the whole scheme is returned back to the ownership of the South Australian government (Keremane and McKay 2007 in Keremane, 2011). This was to help with irrigation of agricultural land to be sustainable. The scheme was very helpful to the community or irrigators because it taught them how to be responsible and reuse water. The framework was well structured that it helped tackle the impediments in the implementation of the project or scheme. As a result of the implementation of the scheme there was effective provision of irrigation services (Keremane, 2011). The experience in the Virginia Pipeline Scheme case study indicates that “collective action, enhanced community participation and well-designed partnerships, makes it is possible to coordinate individuals activities, develop rules for resource use, impose sanctions on violators and mobilize the necessary financial, labor and material resources” (Agarwal and Ostrom, 1999 in Keremane, 2011:44). Also, the provision and sharing of knowledge and information achieved sustainable use of water resources.

2.2.2 Canada: The Vancouver Landfill

The City of Vancouver had long faced problems with their landfill producing large amounts of methane and greenhouse gases that contributes to global climate change. Therefore the city decided to bring the private sector in agreement to change landfill site into beneficial commercial

uses (United Nations, 2008). The approved PPP structure was allowed to design, finance and construct a cogeneration plant that uses landfill gas as fuel to generate electricity. The private partners sell electricity to local community. The partnerships share the revenues from the sale of electricity and thermal energy (United Nations, 2008). The City of Vancouver is “a public partner (owns and operate the landfill) whereas Canadian power company is a private partner, which invented a wholly-owned subsidiary, as a standalone project company to design, build, and operate the cogeneration facility and sell the electricity and thermal energy” (United Nations, 2008:72). Other private partners include BC Hydro which purchases and distribute electricity produced by the cogeneration facility and agribusiness which purchases the heated water produced by the power production process and uses it to heat its greenhouse complex (United Nations, 2008).

In 2001, a competitive Request for Tender was sent out to select a partner who would design, finance, build, own and operate a beneficial use of the facility. After a long selection process from interested partners, a 20-year public private partnership contract was granted by the City Council in February 2002 to the partner of their choice. The private partner who was selected by the City designed, financed and constructed the cogeneration plant, which uses the landfill as fuel to generate enough electricity (7.4 MW per year), to supply to 4000 to 5000 local homes (United Nations, 2008:73). Nevertheless the City did not stop to operate the landfill site. By November 2003, the construction of the power plant was completed and in full operation.

The overall project proves to have benefits. The private sector added value in the knowledge and technology, which is lacking in public sector to transform waste into energy on a commercial basis. There were social and economic benefits of the project as was able to open up about 300 jobs in Delta, the Vancouver receives about \$300,000 a year in revenues from the project, and PPP has transformed expensive environmental programme into a more effective and environmental programme and a net revenue generation for the City (United Nations, 2008). As a result of the project, the environmental benefit prove that there was reduction in greenhouse gas emissions by 200,000 tonnes per year of carbon dioxide, 500,000 GJ of energy would was captured per year which was the energy requirement for 3000 to 4000 households and reduce Can Agar’s annual natural gas use by 20% (United Nations, 2008). The plant was an efficient model in a sense that it makes beneficial use of the products of natural decomposition process

(United Nations, 2008:74). The project therefore, is said to be applicable to other countries from the technological perspective.

2.2.3 Armenia: The Yerevan Water and Sewerage Enterprise

The history of private sector participation in Africa in the water sector dates to 1960 (Project Preparation Guide, 2009). In Armenia, water supply has always been a challenge not only because of its scarce supply, but also because of the weak management and lack of infrastructure to provide water resources (Tokhmankhian and Eiweida, 2011). This challenge was addressed in the last decade through private-public partnerships when the government actively pursued service delivery alternatives with the private sector. The government set up the Yerevan Water and Sewerage Enterprise (YWSE) in 2000 in the Europe and Central Asia (ECA) in the form of a PPP in the water sector. Private sector participation in the Government of Armenia (GoA) has increased and plays a huge role in facilitating institutional change as well as improving service provision (Tokhmankhian and Eiweida, 2011).

The contract lease in Yerevan water continued for ten years with international operator than the government decided to enter into a four year performance-based contract (MC). Partnership and increase of contract was aimed at increasing “efficiency of the operation and development of the city’ s water supply system, increase consumer willingness to pay for the provision of high quality services, provide more responsive service and mobilize the best available managerial and technical know-how” (Tokhmankhian and Eiweida, 2011:2). Management contract brought was advantageous due to that it ensured the highest level delegated management, highly flexible and of limited duration. In short, the partnership was that private sector will operate and maintain water and sewerage infrastructure, billing and a collection whereas the government made sure that long-term sector viability was put into place. The results of the project are considerable since 332 000 households in Yerevan benefited from the project (Tokhmankhian and Eiweida, 2011:2).

2.2.4 Gabon: Société d'énergie et d'eau du Gabon

PPPs have proven to be successful in Gabon. Gabon contract between government and private sector was the first real water concession in Africa for that the investment obligations and sets

coverage targets for the private sector provider. This PPP was initiated in 1997 between the government of Gabon and the Société d'énergie et d'eau du Gabon (SEEG) (owned by the French majority shareholder, Vivendi Water) for the supply of water and electricity. The concession contract is for 20 years. Société d'énergie et d'eau du Gabon SEEG contributes 60% in water rehabilitation. The World Bank and Public-Private Infrastructure Advisory Facility show that contract management of water and electricity was successful due to strong political commitment of the government (Project Preparatory Guide, 2009). For the success of this project it was important to have a right set of legal framework and to increase tariffs levels reflecting costs. According to the Report by the PPIAF (2002) in Project Preparation Guide (2009:101) "SEEG has posted good profits since the start of its operations, paying shareholders a 20% dividend per share in 2000". Partnerships in Gabon assisted in reducing costs by sharing of resources between government and private sector. PPP project in Gabon was successful by the following reasons listed in Project Preparation Guide (2009:101);

- The government supported the project from its conception.
- The government prepared the ground for private sector participation by developing an appropriate legal framework and by increasing tariffs to reflect costs.
- The contract defined the investment obligations and set coverage targets for the consortium.
- The provision of various utilities allowed cross-subsidization of less profitable areas and economies of scale."

2.2.5 The Middle East: Jordan Valley Commission

PPPs, although relatively new, have been used in Middle East. PPPs in the water sector in Jordan are a new development with the first one only initiated in 1999 (Odeh, 2009). PPPs became more frequent in 2009 when decentralization started to take place. Odeh (2009) undertook a study in Jordan on the water sector. The author looked at partnerships of private consortium called Arabtech Jardaneh, Suez Lyonnaise des Eaux and Montgomery Watson to operate and maintain Amman's (LEMA) water system for management contract. One of the case studies Odeh (2009) looked at was the Greater Amman water supply and wastewater services management

contract. The contract was signed by Water Authority of Jordan (WAJ) and LEMA with an aim of restructuring and rehabilitate water supply facilities in Amman (Odeh, 2009). In this partnership, the Water Authority of Jordan was expected to:

- Transfer water to the water treatment plant and distribute the treated water and then supply drinking water to subscribers.
- Collect wastewater and get it to wastewater plants and transport treated wastewater to the receiving bodies.
- Maintain the facilities to specific standards of maintaining and developing a comprehensive maintenance management program.
- Repair and rehabilitate facilities.
- Lastly, take responsibility for billing, collecting and customer services.

The program was evaluated and evaluation reports were written to show the progress of the project. Service delivery was measure by four indicators which are “ water quality, sustainability of the water supply, affordability and financial arrangements, and efficiency of the water services” (2009:2).Yet the challenges for the study were the institutional arrangements. Jordan’ s water sector is one of the poorest in the world due to that it is arable land. Therefore in most part of Jordan, water is supplied through water rationing program meaning water is distributed for certain number of hours during the week so that everyone can get water. Haddadin, *et al* (2006) in Odeh (2009), states that effective water governance was the biggest challenge in Jordan. Therefore, there was a need to encourage participation and accountability.

2.3 Conclusion

This chapter has provided a conceptual discussion of public-private partnerships, and showed that there is no single definition of what PPPs are. Literature indicates that PPPs are difficult to define. But the most commonly used definition of PPPs is that PPPs are long-term contracts between the public and private sector. Legal and policy framework on PPPs were extensively discussed. Both benefits and limitations of PPPs were outlined in this chapter. The chapter concluded by considering different examples around the world of governments' use of PPPs in the provision of water services. The next chapter will look at PPPs in the South African context.

CHAPTER THREE

Public-Private Partnerships in South Africa

3. Introduction

This chapter presents a discussion on PPPs in South Africa post-apartheid. It looks at the origins of PPPs in South Africa. The South African policy framework for PPPs will also be established in this chapter. Since this paper includes a case study component which examines a particular wastewater PPP in Durban, this chapter will also present a general discussion on PPPs in the treatment of wastewater.

3.1 The origins of Public Private Partnerships in South Africa

3.1.1. Defined in South Africa

Like anywhere else in the world, there is no single interpretation of a PPP in South Africa. The South African law defines a PPP as “*a contract between a government institution and private party where: the private party performs an institutional function and/or uses state property in terms of output specifications; substantial project risk (financial, technical, operational) is transferred to the private party; and the private party benefits through unitary payments from government budgets and/or user fees*” (National Treasury, 2007:5). Eichler presents a similar definition by stating that PPP are “*a contractual arrangement between a public sector institution and a private party in which a private party performs an institutional functions or uses state assets and assumes substantial financial, technical and operational risk in the design, financing, building and operation of the project, in terms of benefit*” (Eichler, *et al*, 2001:236).

According to the South African National Treasury, a PPP refers to “*a commercial transaction between an institution and a private party in terms of which the private party performs an institutional function on behalf of the institution and/or acquires the use of state property for its own commercial purposes; and assumes substantial financial, technical and operational risk in connection with the performance of the institutional function and/or use of state property; and receives a benefit for performing the institutional function or from utilizing the state property*” (2004:3).

In a PPP arrangement, the private party receives “a benefit for performing the function or by utilizing state property, either by way of compensation from a revenue fund, charges or fees collected by the private party from users or customers of a service provided to them, or a combination of such compensation and such charges or fees” (OECD, 2010:20 cited in National Treasury, 2012).

3.1.2. Public Private Partnerships in South Africa

Just like in many other countries, PPPs in South Africa are being considered by government as an alternative way of providing public services – an alternative to the public sector providing such services on their own. According to Burger, “after the first democratic election in South Africa in 1994, the South African government set about reforming the approach of government towards the management of state assets by the increasing use of institutional hybridity and a move away from government to governance” (2009:82).

PPPs play a central role in “service delivery and government is committed to PPPs for projects with significant scope for private sector participation” (National Treasury, 2007:7). PPPs have recently increasingly been used in infrastructure and social services projects in South Africa to maximize market presence and business volume (Kaiser Associates, 2005). Though capacity remains to be is a challenge but the government pushes to create a competent degree of capacity and integrated the country’ s public services. The South African government is “committed to deliver quality infrastructure and related services in line with its commitment to ensure a better life for all” (National Treasury, 2007:7). The South African Development Corporations (SADC) Banking Association and other stakeholders have played an important role in sharing knowledge and South African government is trying to take PPP to maturity as it appears high on government agenda (Kaiser Associates, 2005).

The National Treasury PPP Unit was approved in April 1997 when the Cabinet of South Africa appointed an inter-departmental team to develop documents for policy, legislative and institutional reforms to form a pleasant environment for PPPs (National Treasury, 2007). The National Treasury PPP Unit was formally established in 2000. The PPP Unit today consists of seventeen professional staff representing different experts and interests. The purpose was to sieve irresponsible projects at the same time sustaining investor confidence within government’s

public-private partnership. Specific projects that are under the interest of National Treasury PPP Unit are carefully selected to deliver services (National Treasury, 2007).

The PPP Unit at the National Treasury is to help national departments and provincial governments with PPPs to support and advice throughout the project lifestyle. The National Treasury’ s PPP Unit seeks to promote knowledge sharing and improving the level of common services by private sector investment (Kaiser Associates, 2005). Knowledge sharing expanded between key role-players, stakeholders, and parties involved in the project.

The dedicated PPP unit plays a key role in the creation of PPPs where it has the final authority in the approval of PPP agreements (Burger, 2009). The main function for the National Treasury PPP Unit is “to ensure that all PPP agreements comply with the legal requirements of affordability and sufficient risk transfer, in seeking meeting these objectives, the PPP Unit must guide government department and provinces to follow international best practice that will ensure the successful creation of PPPs” (Burger, 2009:90). The PPP Unit oversees PPPs in South Africa (Levinsoln and Reardon, 2007).

The National Treasury PPP Manual explains that the PPP Unit systematically “guides public and private parties through the phases of the regulated PPP projects cycle for national and provincial government, unpacking policy and providing procedural clarity” (National Treasury, 2007:2). The National Treasury PPP Manual also suggests how municipalities should “operate under the Municipal Public-Private Partnerships Regulations, issued in 2005 in terms of the Municipal Finance Management Act of 2003” (Akintoye and Deck, 2009:87). South Africa has three levels of government; national government, provincial government and local government. These spheres of government have different roles and responsibilities in service delivery and meeting human needs. Therefore, there is a range of Acts that regulates local government like Municipal Systems Act (MSA) (No. 32 of 2003).

Akintoye and Deck (2009) suggest that the history of PPPs in South Africa is relatively short. Between 1997 and 2000 there were operational pilot projects adopted for PPPs to see how PPPs work and they were:

- SA National Roads Agency: N3 and N4 toll roads
- Department of Public Works and Correctional Services: two maximum security prisons

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- Two municipality water services
 - SA National Parks: tourism concessions

The Public Finance Management Act (No. 1 of 1999) (PFMA) and Treasury Regulation 16 regulates municipality partnerships under the Municipal Finance Management Act (No. 56 of 2003) (MFMA) offer a clear understanding and transparent framework for government to engage in beneficial commercial transactions for public goods (Department of National Treasury, 2007). South Africa has pride in that it has one of the most developed PPP legal frameworks in Southern African region (South African Development Corporation), where national and provincial government operate by the 1999 Public Finance Management Act and Treasury Regulation 16 and Municipal PPPs operate by the 2003 Municipal Finance Management Act (Levinsohn and Reardon, 2007).

3.1.3. Popular types of PPPs adopted in South Africa

PPP models in South Africa are expanding and becoming extensively used. Their application ranges from short-term contracts, outsourcing, to large-scale long-term concessions. Some of the most common variations are discussed below.

BOOT (Build-Operate-Own-Transfer) model

The private partner *builds, operates* and *owns* the infrastructure for the duration of the contract. At the end of the contract agreement, the asset is *transferred* to the government. This is normally a long-term agreement. BOOT model indicates that the service provider is accountable for design and construction, finance, operations, maintenance and commercial risks that are attached to projects (Kaiser Associations, 2005). An example of this in South Africa is the construction of the Durban Wastewater Reclamation plant.

BOT (Build-Own-Transfer)

The private partner *builds and owns* the infrastructure for the duration of the contract. At the end of the contract agreement, the asset is *transferred* to the government. This is normally long term agreement (Kaiser Associates, 2005). An example in South Africa is the toll road project, the N4 highway from Johannesburg to Maputo.

DB (part) FOT (Design-Build- (partially) Finance-Own-Transfer

The private partner *designs, builds, partially finances* and *owns* the infrastructure for the duration of the contract. At the end of the contract agreement, the asset is transferred to the government (Kaiser Associates, 2005). An example of this in South Africa is Chapman's Peak

DBFOT (Design-Build-Finance-Own-Transfer)

The private partner designs, builds, finances and owns the infrastructure for the duration of the contract. At the end of the contract agreement, the asset is transferred to the government. Examples of this in South Africa are construction of Inkosi Albert Luthuli Hospital in KwaZulu-Natal Department of Health in 2001, construction of Eco-tourism Manyeleti three sites in Limpopo By department of Finances and Economic Tourism.

Equity partnership

Private partner and government equally share ownership including its costs, risks and benefits. This can be a short or long-term partnership arrangement. An example of this in South Africa is the building of State Vaccine Institute by Department of Health in December 2009.

The South African government is engaged in projects and programs that include transport, waste water treatment, office accommodation, healthcare, eco-tourism, social development and correctional services (Ball, 1999 cited in Department of National Treasury, 2007). An operation and maintenance contracts are linked to a design and construction contract (Kaiser Associates, 2005). The service provider normally takes part of financing the project when it is under construction with the government buying the asset from the developer for a pre-agreed price before commissioning and taking all ownership risks from that time. PPP models have a potential of promoting transparency to private sector participants (Kaiser Associates, 2005). The PPP models have been applied to state vaccine institutes and public services such as; fleet management, iNkosi Albert Luthuli Hospital, Eco-Tourism, Universities and Pelonomi Hospitals, information systems, state vaccine institute, Head of accommodation, cradle of

humankind interpretation cradle complex and social grant payment system (Kaiser Associates, 2005).

3.2 A Background to Water in South Africa

Water is essential to human life and also is a scarce commodity in South Africa (Larson, 2010). Every living organism needs water including human beings at large. Water has been interpreted as the basic human right that cannot be commodified. Therefore, it is the responsibility of the state to be accountable to its citizens. Water is “a product or service, and can be delivered to the consumers through the market” (Larson, 2010:7). Initially, water services have been supplied by the public sector or government. Water has been owned and controlled by the government in terms of being responsible for day-to-day running of the usefulness (Okeyo, 2013).

Literature indicates that during apartheid there was inadequate provision of water services to the majority of South Africa’s black population. Therefore, right to use water in South Africa was subject to the principles of South African water law that was developed by the national States and self-governing territories with origins from the Roman law, Dutch and English law (Thompson, 2001).

South Africa “is a water-scarce country” and its gets water from surface water such as rivers and dams that is sustained by rainfall and surface water (DBSA, 2012:43). South Africa is defined as a “water stressed” country (Kidd, 2009 cited in Larson, 2010). Turton (2008) cited in Beires (2010:5) states that “water scarcity refers to a condition that exists when the demographically induced demand for water exceeds the prevailing level of local supply and the manifestation of an increase in population growth, which may be a result of natural growth or due to migration to a specific area”.

Water scarcity issue is a matter of supply and demand in South Africa. DBSA (2012) sees water scarcity as a growing challenge in the implementation of measures for water demand management that is usually outshined by a focus on water supply. According to DBSA, water demand exceeds supply on a national level, with projections indicating that the gap will continue to grow”. There is about 36 million cubic kilometers of fresh water in the world yet a human demand for fresh water is starting to outstrip the supply (Larson, 2010).

The South African future on the economic development is said to be constrained by water scarcity as all exploitable water sources have been tapped (Beires, 2010). According to the Department of Economic Development, water scarcity has far reaching implications for economic development, food security, the survival of the city and citizens (Beires, 2010:5). Future predictions about the state of water is that South Africa by 2025 will be facing extreme water scarcity problems which is a serious issue for developmental plans on economic development, increased service delivery and industrial development when natural water resources does not exist to assist this demand (Beires, 2010). This condition will highly affect decision making on the feasibility use of water with regards to development activities and assigning priority needs.

The problem of water supply in the twentieth century is becoming a political issue. Therefore, Beires (2010:5) suggest that in the future, water provision will be “an important factor in decision making regarding feasibility of certain developments and competing needs”. In terms of the world ranking, South Africa is the 30th dry country in the world with only 500mm of rain per year which is way less than 860mm world average per year (Beires, 2010). According to Nzimakwe, in 2009 there were 9 million people in South Africa who did not have access to potable water within 200m in their homes.

According to the South African National Development Plan, 2030 (hereafter referred to as the NDP) 46.3 million South Africans now have access to water as opposed to 23 million in 1994. (This is a change of access from 59 percent to 93 percent of the population). Closely related to water is the provision of sanitation. According to the NDP, access to sanitation increased from 18.5 million to 39.4 million (from 48 percent to 79 percent). (National Planning Commission, 2011:154). South African water infrastructure sector is composed of water resources and water services. Water is captured in dams, processed or treated by Water Boards (government public entities), sold to municipalities in bulk who than distribute it domestic and commercial users.

The year 2014 has been dedicated as the year where the government set as a new target for providing basic water supply and sanitation services to all South Africa (DBSA, 2012). Between 2009 and 2014, water sector was to focus on the following areas according to the DBSA (2012:43):

-
- Meeting targets for the delivery of water supply and sanitation services to ensure 100% access.
 - Managing South Africa scarce water resources and supporting the development of bulk water sources infrastructure for long term sustainability;
 - Spearheading transformation in the water sector with regards to water allocation;
 - Improving the regulatory and institutional environment; and
 - Curbing water losses by at least 50% of the national average of 35%.

The purpose for the above targets is that “water sources within the country’ s borders are protected, used, developed, conserved, managed and controlled in a manner that is sustainable and equitable for benefit of all people” and that all “people in South Africa have access to adequate, sustainable, viable, safe, appropriate and affordable water and sanitation services, use water wisely and practice safe sanitation” (DBSA, 2012:44).

The 2030 vision for South Africa according to the National Development Plan states that all South Africans should have reasonable access to adequate safe water and hygienic sanitation to live healthy and dignified water (National Planning Commission, 2011). Local governments are expected to take responsibility for making sure that there is sufficient water service provision in their respective areas and regional utilities will supply services where municipalities do not have enough technical and financial capacities to provide for water services (National Planning Commission, 2011). The availability of adequate water resources will help in water supply and sanitation services. Poor management of water supply in the future will lead to extinction of natural resources (National Planning Commission, 2011). The vision for 2030 about the state of water in South Africa is that “all main urban and industrial centers will have a reliable supply of water to meet their needs, while increasingly efficient agriculture use will support productive and inclusive rural communities” (National Planning Commission, 2011:153).

3.3 Key challenges for PPPs in South Africa

The water sector in South Africa is faced with an ongoing challenge to “accelerate the rehabilitation of dilapidated infrastructure, the development of water resources infrastructure, and the delivery of water services infrastructure, while ensuring effective and sustainable maintenance of existing infrastructure” (DBSA, 2012:67). The unsustainable use of resources such as energy and water has major impacts on the environment, and will ultimately compromise the Municipality’s energy security, as well as its ability to deliver water of adequate quality and quantity to its citizens.

According to the DBSA, while there is greater access to potable water - from 84.5% in 2002 to 89.3% in 2009 yet the challenge remains with ongoing backlogs (DBSA, 2012). According to the DBSA (2012:67) “water demand management is usually overshadowed by a focus on water supply”. This means that water demand exceeds supply on a national level and that the gap will continue to grow. The water sector of South Africa’s main challenge has been identified as the need for ongoing development of infrastructure, effective operation and sustainable maintenance of infrastructure and the management of water quality in the entire water services value chain (DBSA, 2012).

The literature on PPPs argues that PPPs may offer government an opportunity to provide much needed infrastructure. However, according to Castalia (2007) the main challenge for South Africa is that there is poor planning and implementation. The challenges for PPPs are based on principal institutional and legal issues. PPPs do not have unlimited access to resources, and one cannot assume that PPPs can be applied in any specific sector in any municipality (Castalia, 2007). Limited resources and a lack of capacity in government and its departments pose problems for the overall management of the PPP too. Burger (2006) is of the opinion that the current PPP framework is limited in providing knowledge management within PPPs and “valuable skills obtained during the creation and development of a PPP contract is not transferred to other contracts, implying that departments need to create capacity with new contracts” (Burger, 2006:15). There is a lack of “systematic ways of collecting, documenting and sharing information on the lessons learnt from the implementation of PPPs” (HRD Strategic Framework, undated: 2007).

The “operational definition of PPPs remains unclear” meaning an additional clarity on the implementation agencies in municipal level is needed (Castalia, 2007:4). Castalia (2007) also suggests that in their quest to ensure high quality of PPP transactions in South Africa, the National Treasury has drafted many unnecessary regulations, making the process more complicated and unwieldy than necessary.

Water contamination or pollution is increasing in river systems. The main causes for water pollution as impacting our water supply are “industrial and mining pollution; raw or poorly treated sewerage in rivers; and global warming which is increasing water temperatures and increasing algae growth in our freshwater systems” (Beires, 2010:6). Moreover, lack of expertise and skills at a municipal level contributed in water contamination.

According to the South African Institute of Civil Engineering (SAICE), lack of qualified engineering at municipal levels to deal with water quality issues and problems of ageing infrastructure worsen the situation. This gives the picture that there is a breakdown of newly built infrastructure at the municipal level on the existing water processing (Beires, 2010). Furthermore, KwaZulu-Natal and the Eastern Cape are, according to Newmarch (2012) struggling with infrastructure backlogs. Wastewater treatment is “a municipal duty but severely underfunded and have competing financial pressures as well as under-sourced facilities and infrastructure (Newmarch, 2012:5).

Different stakeholders have different interests as some come with disparate bargaining power, competences and resources and may impact negatively on the planned outcomes for the PPP. Unclear communication processes are a big challenge as it impact on stakeholders with small resources and bargaining powers. Unclear communication also confuses roles as to it does not gives distinct roles that individuals needs to perform. Changes in management structures of PPPs challenges smooth flowing of implementation processes.

Municipalities are faced with challenges of meeting the constitutional requirements to make sure that they are applied effectively, equitable and sustainable delivery of water supply and sanitation to all (Nzimakwe, 2009). The distribution of wealth, budget, service provision and

water resources remains a challenge for local governments (Nzimakwe, 2009). Financial dependence of municipalities to provincial governments remains a challenge in South Africa.

National Treasury PPP Unit takes competition very serious as an element in making sure that there is value for money, therefore, competitiveness turns to be problematic during contract or project period (Burger, 2006). At the same time, competition needs to be created in the PPP market especially when it comes to funding of projects by means of financial institutions (National Treasury, 2007). The challenges faced by the municipalities in South Africa are based on issues of “legacy of complex and interlinked legislation that involves inherent confusion and duplication” (Levinsohn and Reardon, 2007:2). The MFMA and MSA have requirements in the law to be met and that becomes a difficult task for the municipality due to lack of capacity.

Water sector is faced with inadequate capacity within service providers who can take full responsibility. Capacity limitations remain a great challenge at municipalities and shortage of appropriate skills in management and operational levels (DBSA, 2012). Capacity limitation slows services delivery at municipalities. At municipality level, institutional capacity is the primary constraining factor (DBSA, 2012).

3.4 Opportunities for PPPs in South Africa

The National Treasury (2007:14) states that “PPPs can be more valuable to municipalities because municipalities are charged with some of the important levels of service delivery, such as the provision of water, solid waste disposal, the provision of social and low cost housing and electrification”. PPPs at the municipality render an opportunity to reduce backlogs in service delivery. Municipalities have a responsibility for improving the quality of life of the poor. Investing in infrastructure opens opportunities for changes in establishing institutions like Trans-Caledon Tunnel Authority and partnership within the region such as Lesotho Highlands Project (National Planning Commission, 2011).

As a result of PPPs at local government, there are a number of beneficiaries such as “water and sanitation provision at small municipalities are employing private sector operators” (Kaiser

Associates, 2005:27). PPPs at local government level open other opportunities such as solid waste treatment, energy provision, and airport maintenance and services delivery. Besides that, public-private partnerships are a responsibility of government and private institution, all individuals, community groups, private firms and the state to improve the provision of water services (Okeyo, 2013).

3.5 Legislative and Policy Framework in South Africa

During the apartheid era (in 1980s) many municipalities in South Africa had problems of services delivery. Then in 1990s, it came to the attention of local government that it was difficult to render services alone. Therefore, partnerships were needed in local government to deliver services. PPPs were formed with Municipal Service Partnership (MSP) in service delivery at local government. MSP is considered as the most useful tool in rendering services to local citizens.

The Department of Constitutional Development organized a regulatory framework for services delivery. The framework is aimed at “promoting participation on the side of private companies, to develop sustainable infrastructure services and ensure efficient and effective delivery services” (The Department of Constitutional Development, 1998). The framework is based on the quality of the service given. In this regulatory framework, the local councils have to make sure that services are provided at a reasonable price and at a good standard. The framework assists in giving clarity in institutional and responsibilities and requirements assists local government by implementing PPPs (The Department of Constitutional Development, 1998).

After 1994, the South African government ensured that water will be treated as a national resource and water laws and policies will be considered primary (DBSA, 2012). In the Constitution of South Africa, Section 27 of 1996 states that “everyone has the right to have access to... sufficient food and water... The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of each of these rights”. There were major developments in water sector policies and legislation in re-addressing water issue. Changes were that municipalities are responsible for providing free basic water to

the citizens. The DBSA states that “water treatment works and distribution reticulation systems are the responsibilities of local government through the Water Services Authorities” (2012:46).

According to DBSA (2012:45), after 1994 policies emphasized *access to water services* more than anything else; not forgetting “strong component of social equity, ecological sustainability, water conservation and demand management, and the decentralization of water services delivery”. The policy framework for PPPs was recognized in 1999 and the National Treasury published PPP regulation in April 2000. The new Constitution and the Bill of Rights introduced the basic human right of access to sufficient water and health environment.

National government is expected to come up with policies and minimum standards of how water policies should be implemented. The provincial government can also adopt regulations that the local government can use with regards to wastewater management strategies and implementing those strategies. Roman (2010) also emphasize that local government can adopt wastewater management strategies highlighted by the national requirements and implement them. Therefore, the “national government policy identifies Wastewater Management as a cross cutting issue that must be taken into consideration when economic and social development decision are being made” (Roman, 2010:13).

The National Development Plan vision for 2030, suggests that key policy issues guide appropriate actions to improve the management, use and conservation of South Africa’s water resources to support the economic uses of water that includes urban consumption, needs to be funded by users through suitable pricing measures, which will include arrangements to ensure that all people can afford access to basic water services. Policy is needed to guide all investments and improve management capacity to tackle the increasing pressures on water resources.

There is no specific law to wastewater treatment as such but the National Water Act is the legislative framework. Therefore, wastewater treatment designers need to understand and implement all relevant legislative regulations that are related to planning, design, construction and operation of wastewater treatment works as given by the Internal Guideline: Generic Water Use Authorization Application Process, August 2007 by Department of Water Affairs (Department of Public Works, 2012).

According to the Constitution of South Africa, local governments are tasked to provide access to water and sanitation services to all citizens of the country. The government, especially local government, is legally obliged to meet national standards for regulatory requirements in providing water. So any arrangements must make sure that the regulations are not contravened.

South Africa has four policy documents that underpin the legislation administered by the Minister: White Paper on Water Supply and Sanitation (1994), White Paper on a National Water Policy for South Africa (1997), White Paper on Basic Household Sanitation (2001) and the Strategic Framework for Water Services (2003).

The National Water Resources Strategy adopted a framework which directly addresses the linkages between water management and the developmental and transformational goals of government called developmental water management (DWA, 2013). The focus of developmental water management is on the priority actions within the delivery capacity of the state and other role players which will results in greatest developmental impact.

3.5.1. The Water Services Act 108 of 1997

The Water Services Act (WSA) “provides rights of access to basic water services for all citizens and assists municipalities to undertake their role as water services authorities and to look after the interests of the consumer”. The WSA gives everyone a right to access to basic water supply and sanitation as a Constitutional right to water and gives authority to construct sufficient pipes that will supply piped water within 200 meters of every dwelling (Larson, 2010). Water service providers are able to consider the rights through this Act. The South Africa Constitution gives all citizens the right to have access to adequate water and gives the state a task to take reasonable measures to achieve the realization of this right (Nzimakwe, 2009).

As a result of this Act, authorization process for using water is required in terms of Environmental Impact Assessment (EIA) – Regulations. EIA – Regulations seeks to control “the procedures and criteria that are in line with submission, processing and consideration of, and decision on, applications of environmental authority for the starting of activities in order to avoid detrimental impacts on the environment or where it can be avoided, to make sure that mitigation and management of impacts to acceptance levels, and to optimize positive environment impacts and matters based on that” (Department of Public Works, 2012:3).

3.5.2. The National Water Act 36 of 1998

The National Water Act (NWA) of 1998 and the Water Services Act of 1997 prescribed water sector institutions as a machinery for implementation of water sector policies, development, management of water resources and delivery of water services (DBSA, 2012). According to Blue Drop handbook, the Department of Water Affairs has a responsibility to regulate water services as portrayed in Section 63 of the Water Services Act (No. 108 of 1997).

The Act was in favour with “comprehensive reform, abolishing private ownership of water, placing all water resources in a public trust, and establishing a compulsory licensing system that promised to facilitate equitable distribution of the country’s water resources” (Larson, 2010:35). The vision behind this law was that one day South African will have clean water. The Act wants to make sure that “nations water resources are protected, used, developed, conserved, managed and controlled in ways which take into account, the needs of present and future generation’s equitable access to water and preventing and minimizing pollution and degradation of water resources” (Goolam, 2000:125).

3.5.3. Municipal Systems Act 32 of 2000

The municipal Systems Act (MSA) defines municipal services as “a municipal service that is necessary to ensure an acceptable and reasonable quality of life and, if not provided, would endanger public health or safety or the environment”. MSA allows a municipality to regulate the mechanism for provision of services, that also include water supply and sanitation services. The MSA mandates a municipality assess if it’s possible to deliver service provision. Only if it’s possible that Water Services Authority (WSA) can offer these services over internal mechanism. External mechanism can be rendered by local government when it is convenient to provide services. According to the Department of Water Affairs, Water Services Authorities are “metropolitan municipalities, district municipalities and authorized local municipalities” (DWA, 2002:22).

The White Paper on Water entitled “Water is Life, Sanitation is Dignity” clearly points to government’s responsibility to the provision of at least basic water and sanitation service to all South African citizens. According to White Paper, water and sanitation remains a significant

policy concern. In 2008, the government was committed to minimize backlogs in water and sanitation in 2010.

3.5.4. Free Basic Water (FBW) Policy

Free Basic Water Policy is mandatory at municipality as it is the responsibility of the government to provide free water for all. This policy means all South Africans have a right to a basic amount of water and basic sanitation that is affordable. The Free Basic Water Policy was established in 2002, and seeks to give free water to individual persons 25 litres per day which is level sufficient to promote healthy living, this amount to about 6000 litres per household per month for a household of eight people (Department of Public Works, 2012). In 2001, the national programme for providing 6kl of water per household per month was implemented to assist all poor household (Nzimakwe, 2009). Anyone consuming more than 6kl per day will be charged by the amount of water used in the agreement with the principle of full cost recovery.

This policy ensures effectiveness that no consumer is without water supply for more than seven full days (Department of Public Works, 2012). The FBW Policy was formally recognized by the 2003 Strategic Framework for Water Services to be applied and implemented in all local municipal authorities. The policy was implemented as it was stated and the government played his role in supplying water to people. The DWAF reported that “78.8% of the population was served by free access to Free Basic Water and 68.86% of the poor population was served” (Roman, 2010:15)

It has been the South African government mandate “to provide each individual with at least 25 litres of water per day within 200 meters of their home and to provide each household with basic sanitation in the form of at least a Ventilated Improved Pit (VIP) latrine” (Roman, 2010:14). Local government received authority after the elections of 1994. Where the local government is unable to supply water for citizens, the Department of Water Affairs and Forestry (DWAF) has a responsibility to make sure that all the citizens have access to water and sanitation services (Roman, 2010).

3.5.5. Strategic Framework for Water Services Act of 2008

A Strategic Framework for Water Services was developed in 2003. It outlines the various organizations and structures responsible for the management of the water sector in South Africa.

According to the Framework, the organizations currently involved in water services include the following:

- The **Department of Water Affairs (DWA)** is responsible for sector policy, support and regulation. DWA currently operated water resource infrastructure (such as dams), some bulk water supply schemes and some retail infrastructure (providing services directly to consumers). DWA water services assets are currently in the process of being transferred to water services authorities. The **Department of Provincial and Local Government** regulates and oversees the activities of local government. Other **national government** departments and **provincial governments** also play an important role in supporting the water services.
- **Water services authorities** (metropolitan municipalities, some district municipalities and authorized local municipalities) are responsible for ensuring provision of services within their area of jurisdiction.
- **Water services providers – Municipalities** operate some water resource infrastructure (such as dams and boreholes) and bulk water supply schemes, supply water sanitation to consumers (households, businesses and industries) and operate wastewater collection and treatment systems.
- **Water boards** operate some water resource infrastructure, bulk potable water supply schemes (selling to municipalities and industries), some retail water infrastructure and some wastewater systems.
- **Community-based organizations** manage some water schemes in rural areas.
- **Publicly or privately owned companies** provide some water services. For example, Johannesburg Water is a public water utility wholly owned by the City of Johannesburg Metropolitan Municipality. The direct involvement of privately owned companies in the operation of water services in South Africa has been limited (only five) to date. Section 21 companies provide water services (for example, the Midvaal Water Company). Two long-term concessions have been contracted with private companies, being the Dolphin Coast and Nelspruit.

The Framework reiterates that the Department of Water Affairs is the official regulator of the water sector. The DWA must define compulsory norms and standards (this is published in its Blue Drop Handbook for water services; and Green Drop Handbook for sanitation services). The Framework reiterates that the DWA has a duty to monitor Water Services Institutions as clearly stated in Section 62 of the Water Services Act (No. 108 of 1997). The strategy is aimed at reducing the backlog on the basic service provision and maximizes access to basic service provision such as water.

The Strategic Framework for Water Services (2003) provides a fundamental policy framework for municipalities that have been tasked with the responsibility for the provision of water. The Framework emphasizes the need for local government to be aware that water is a scarce resource (page 29) and hence municipalities must adopt a sound water management process; and it also stresses that municipalities should consider private sector involvement.

Table 3.1: Water Ladder

Water Ladder

- 1. The right to access to a basic water and sanitation service (the first step).** Everyone has the right to have access to sufficient water, to an environment that is not harmful to his or her health or well-being and to have the environment protected, for the benefit of present and future generations. The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of these rights. National government will continue to provide subsidies to the water services sector to promote the realisation of the right to a basic water supply and sanitation service.
- 2. Higher levels of service (moving up the ladder).** As economic affordability increases and the backlog in the provision of basic services reduce, it will become possible for more and more households to be provided with higher levels of services. National government will increase the resources made available for the provision of water services in real terms over time.
- 3. Consumer responsibility.** The right to basic water supply and sanitation services comes with a corresponding responsibility, namely, to use water and sanitation services responsibly and with due care, and to pay for services provided over and above services provided in terms

of the free basic water and free basic sanitation policies.

4. **Ownership of assets.** Water is an important social good (“Water is life”) and it is government’s responsibility to protect this public interest. Water services infrastructure built with public funds and for public benefit will not be alienated from public ownership (privatised).

5. **User charges (retail).** Charging for water services is essential in order to generate funds for operating, maintaining and investing in water systems. However, tariffs must take into account the affordability of water services for the poor. User charges will be based on the volume of water used and wastewater generated wherever practical and will reflect full financial and economic costs, taking into account the subsidies necessary to ensure the affordability of water services to poor households.

6. **6. Operating in accordance with sound business principles.** Water services must be run in accordance with sound business principles within a sound subsidy framework. Failure to do this will substantially increase the risk of the service not being sustainable. Sound business principles include good governance, independence of action, sound accounting, adequate provisions for depreciation, adequate spending on maintenance and replacement of assets, effective and efficient use of resources, and income (including subsidies) which covers expenses.

3.6 Private Sector Involvement, Private Operation and Privatisation

While privatisation is an emotional and very much political issue in South Africa, the private sector has played and will continue to play an important role in water services. The challenges facing us are simply too big to be addressed by government alone. We will, however, not sell our public water services infrastructure to the private sector but this is no obstacle to the private sector getting involved in a whole range of activities. (Minister Kasrils, address to the African Investment Forum, April 2003). The Water Ladder presented in the 2003 Strategic Framework for Water Services is applied in Durban Water Recycling Plant PPP in that it enable the municipality to provide higher levels of water services. By providing recycled water to

companies such as Mondi Paper and SAPREF Refinery it has made even more potable water available for its residents.

The following definitions are cited in the in the 2003 Strategic Framework for Water Services and are worth citing:

- **Private sector involvement** includes support services (consulting services, outsourcing of various activities such as meter reading, cleaning, maintenance, etc.),contracting (construction, operations, management), the management of operations(private operation as defined below), and financing (bank loans, bonds, equity).
- **Private operation** is the operation of water assets by the private sector. Where this is done on behalf of government, it could be through a lease contract, a concession contract or a build-operate-transfer (BOT) contract.
- **Privatisation** is the permanent sale of fixed assets (that is, divestiture) by the public sector to the private sector, and/or private investment and perpetual ownership of assets. In terms of South African law and policy for water services, this is not allowed.

3.7 Conclusion

The common definition for PPPs in South Africa is that PPPs are contract arrangements between public sector and private sector and commercial transaction. PPPs have short history in South Africa. South Africa is known as a dry country or water scarce country.

The role of dedicated PPP unit consists of “the authority to approve PPP agreement and the rendering of technical assistance in the creation and maintenance of PPPs” (Burger, 2009:95). Furthermore, the initiative, ultimate management and accountability regarding PPP agreement lies with individual government department and provinces (Burger, 2009:95). According to Burger (2009), South Africa lack capacity and skills in government departments and provinces to manage PPPs, therefore, the government needs to pay more attention in creating skills within government to deal with PPPs in government departments.

After 1994, the government introduced a number of water legislations and policies outlined in this paper. The Constitution gives all South African citizens access to high quality water for

consumption and use. While PPPs are alternative way of service delivery for municipalities, municipalities must still make sure that the provision of water services meets all the legislative requirements.

CHAPTER FOUR

The Case Study

4.1 Introduction

This chapter presents a case study of the Water Reclamation Plant which is a Public-Private Partnership (PPP) in the city of Durban, in the eThekweni municipality. The building of the plant through a PPP arrangement was part of the municipality's water recycling project.

This chapter will first provide a socio-economic background on the eThekweni municipality in order to contextualize the water recycling issue. This issue dates back to before the boundaries of the eThekweni municipalities were finalized in 2000. A brief summary of the water and sanitation issues facing the city of Durban will therefore be provided.

This chapter will present a descriptive analysis of municipality's adaption of the PPP approach as one approach to water shortage challenges. The chapter continues by providing a brief background to the municipalities in order to contextualize the municipality challenges.

4.1.1 General Background on Durban

The city of Durban was always considered to be a well-resourced, well managed, well maintained and with high levels of service delivery, which were comparable to first world standards. However, the reasons cited are because it was supported by white business and wealthy residents (Narsiah, undated). In the beginning of South Africa's movement towards a democratic government (in the early 1990s) Durban's predominantly whites only boundaries were removed because of the democratic process, and the riches now had to be shared with all resident near the metropolis.

The head of Durban Water and Sanitation Services (DWSS) said "the political structures changed completely and the water and services division at that time (before 1994) were structured wrongly" (Narsiah, undated: 13). The situation in Durban shows that before 1993 service delivery was racially biased, servicing predominantly white areas. According to the Head of DWSS, the municipality failed to supply sufficient water to it citizen. As a result, the new municipal leadership inherited service delivery such as water and sanitation. The eThekweni

metropolitan municipality started to work with groups outside of government. It established focus groups and user platforms to share experiences with other cities like Cape Town (Narsiah, undated).

The city of Durban is located on the east coast of South Africa in the Province of KwaZulu-Natal. The municipality covers an area of about 2 297km² (2013/14 eThekweni Metropolitan Municipality IDP). In 2001 the population was 3.09 million and it has been growing over the years. In 2011 the population has grown up to 3, 442, and 361 (Statistics South Africa, 2011). Furthermore, the eThekweni Demographic Projections predict that the population will be estimated to 3, 818, and 499 by 2021. This is an average annual growth percentage of 1.13% per annum. The majority of the population comes from the African community (73.8%) followed by the Indian community (16.7%), the White community (6.6%) and the coloured community (2.5%) and others are just 0.4% (2013/14 eThekweni Metropolitan Municipality IDP).

The majority of the population is made up of individuals between the ages of 15-34 old. The major forces that drive population growth in the eThekweni municipality are “fertility, mortality, migration, HIV prevalence and access to Anti Retro Virals” (2013/14 eThekweni metropolitan municipality IDP: 20). In terms of the gender ratio in the municipality 49% are of male and 51% are of female.

According to the 2013/14 eThekweni Metropolitan Municipality IDP, in 2012-13, 75.2% people who satisfied with life and 24.8% were dissatisfied with life. Reasons that people were satisfied with life included good health, spending time with family and friends, having a good life, employment and economic opportunities while dissatisfaction with life include unemployment, health problems, financial problems, crime and basic needs not being met. The Integrated Development Plan (IDP) identifies the growing population size as a potential problem because it places great demand on service delivery and infrastructure development. Dissatisfaction was raised regarding municipality’s lack of service delivery. The municipality has acknowledged in its IDP that problems exist pertaining to wastewater, backlogs and water supply in the eThekweni region. Water supply and sanitation has created inequalities in eThekweni as a result of apartheid history.

The 2013/14 eThekweni Metropolitan Municipality IDP highlights problems facing the eThekweni municipality especially pertaining to pressure for services such as water and sanitation. Despite economic growth, the IDP points out other challenges such as “high levels of poverty; low levels of skills development and literacy; limited access to basic household and community services; increased incidents of HIV/AIDS and communicable diseases; loss of natural capital; unsustainable development practices; high levels of crime and risk; ensuring adequate energy and water supply; ensuring food security; infrastructure degradation; climate change; ensuring financial sustainability; ineffectiveness and inefficiency of inward-looking local government still present in the municipality ” (2013/14 eThekweni Metropolitan Municipality IDP:76-78). Increased levels of water and sanitation backlogs also prevail.

There are four large-scale wastewater works facilities in South Africa that have been built by using private sector funding arrangements. These are:

- Sasol Synfuels Wastewater Treatment Works in Secunda, Mpumalanga
- Sun City Wastewater Treatment Works in City, North West
- Nedbank Olwazini in Mulders drift, Gauteng
- Durban Water Recycling PPP, KwaZulu-Natal.

For the purposes of this study, the Durban Water Recycling PPP will be considered extensively in this chapter.

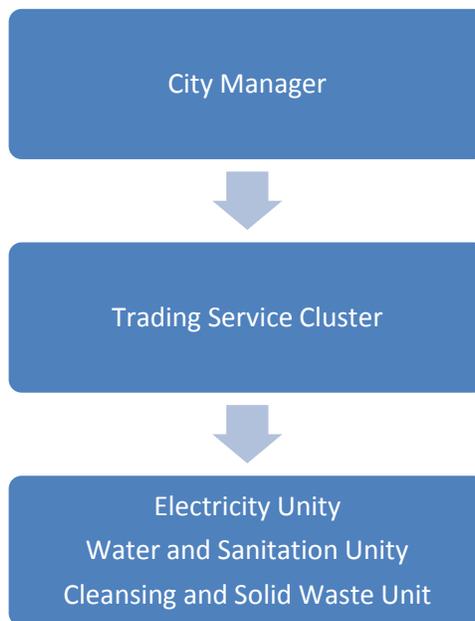
4.2 Political and Administrative Configuration of eThekweni

The city manager heads the administrative departments of the municipality and is assisted by six deputy city managers. Each of the six deputy city managers is led by six clusters supported by technical and professional staff. The Water and Sanitation Unit is one of the clusters and is responsible for the provision of clean and potable water for the treatment of the whole municipal area. The department ensures that all projects and facilities comply with domestic sewage and wastewater treatment regulations. The eThekweni (just like all other local government municipalities) became legally tasked with the provision of water and sanitation to its residents. It became the responsibility of the eThekweni Department of Water Services to provide water to its residents.

Political and administrative structures are tasked with addressing the challenges identified in the municipality's IDP. Politically, the municipality is governed by a council comprised of 205 members. This council elects Mayor, Deputy Mayor and Speaker. The municipal council is further governed by an Executive Committee and several implementation committees that oversee the implementation functions of the municipality.

Administratively, the city Manager (appointed by the Council) heads the city management structures, assisted by eight Deputy City Managers and each Deputy heads a cluster. This is graphically depicted in Figure 4.1 below

Figure 4.1: The Political and Administrative Structure of eThekweni municipality



4.2.1 The Department of Water Services

The Department of Water Services falls under the Water and Sanitation Unit. The mandate for EThekweni's Department of Water Services extends to provide water services to everyone. This refers to water supply and sanitation services. The EThekweni is both the Water Services Authority and Water Services Provider. The Water Services Authority is responsible for the

“provision of water services within their appointed areas includes metropolitan municipalities, many district municipalities and authorized local municipalities” (Eberhard, undated: 1). Water Services at the municipality “control some local water resource infrastructure and bulk water supply schemes, supply water and sanitation to consumers and operate wastewater collection and treatment systems” (Eberhard, undated: 6). These problems that the Durban Water Services facing is meeting its municipal obligation of providing clean potable water to an ever increasing population. Water is in scarce supply to the consumers that are often too poor to pay for it. This scenario prompted the Department to undertake an extensive water recycling project. This is the focus of this next section.

According to eThekweni Water and Sanitation Unit (2004d:52) the “eThekweni Water Services is committed to provide school children with the knowledge about water (and sanitation) through a structured and sustainable education programme and also focus on promoting water conservation, water demand management, sanitation and health and hygiene awareness among learners and adult members of the community”.

4.2.2 The Durban Water Reclamation Plant PPP

The Durban Water Reclamation Plant is geographically located to the “south of Durban in the grounds of the city’s Southern Wastewater Treatment Works (SWTW), where primary treated wastewater is discharged into the Indian Ocean through a marine outfall pipeline” (Gisclon, 2002:1). According to Bhagwan (2012), the city’s wastewater treatment works is faced with challenges of sewage capacity constraints. The costs associated with the construction of a new outflow or marine outfall pipeline is regarded as too high. Therefore, the plans were to maximize existing wastewater treatment infrastructure and capacity through building a duplicate sewer line, but even then, the costs were regarded as too high. The city actively pursued a municipal wide water recycling programme, including the use of effluent for reuse (Bhagwan, 2012).

The Southern Wastewater Treatment Works is situated in the suburb of Merebank, Durban and this treatment works was “commissioned in 1969 and treats 168 MI/day” (Pillay, 2006, 2-8). SWTW treats 36% of the eThekweni wastewater and receives domestic sewage from the areas of Chatsworth and Merebank and industrial effluents from the surrounding industries such as

Mobeni sewer line. There is also a reception station for tankers to process wastewater. (Pillay, 2006).

In 1993, as part of the municipality's recycling programme, the eThekweni Water and Sanitation (EWS) department established a "wastewater reclamation process for the production of high-quality water and tested it at laboratory and pilot-scales-in 1994 and 1995" (Parliament Liaison Office, 2010:2). The discoveries from early process development work resulted in a "tertiary treatment process consisting of chemical phosphate removal, sand filtration, ozonation, granular activated carbon adsorption and chlorination" (Gisclon, et al, 2002:2). The pilot results proved that there were high quality reclaimed water, meeting Mondi paper's exacting standards, could be reliably produced from the wastewater entering Southern Wastewater Treatment Works (McCarley, 1996 cited in Gisclon, 2002).

Mondi Paper (a national paper manufacturing company) is located in the southern part of Durban, adjacent to the SWTW. Mondi Paper actually wanted the eThekweni Water Services to examine the options of increasing Mondi Paper takeoff 8 Million litres (ML) per day of low grade reclaimed water to a substantially larger volume of high quality reclaimed water (Gisclon, *et al*, 2002). Mondi Paper is actually receiving recycled wastewater from EThekweni Water Services. Mondi Paper is situated 200m away from the SWTW (Robbins, 2004).

The Mondi Paper Mill in Merebank and the SAPREF Refinery owned by Shell and BP are the two largest customers for Durban Water Recycling (Pty) Ltd (Bhagwan, 2012). Mondi Paper observed "the quality of the recycled water as sufficient to meet its requirement for the highly sensitive fine paper production process" (eThekweni municipality, 2006c:62). The SAPREF Refinery normally uses water for cooling in their oil refining process. SAPREF Refinery and Mondi Paper threatened to move their operations of the project if Veolia refuse to sell treated water at a lower cost. The EThekweni Water Services approached the unions with a proposal to undertake a public-private partnership¹ with SAPREF Refinery and Mondi Paper.

The municipality thought of building a recycling plant in order to minimize the amount of water that was bought from Umgeni Water. As a result of water scarcity in Durban, the eThekweni

¹It must be borne in mind that the initiation of this PPP took place prior to the national government's official presumptions for the establishment of PPPs

municipality took an initiative on this reality to start up a wastewater recycling programme (Parliament Liaison Office, 2010). The eThekweni Water Services Council started to investigate the recycling of treated wastewater due to that Durban treats 450 million liters of water daily in this region (eThekweni municipality, 2011b).

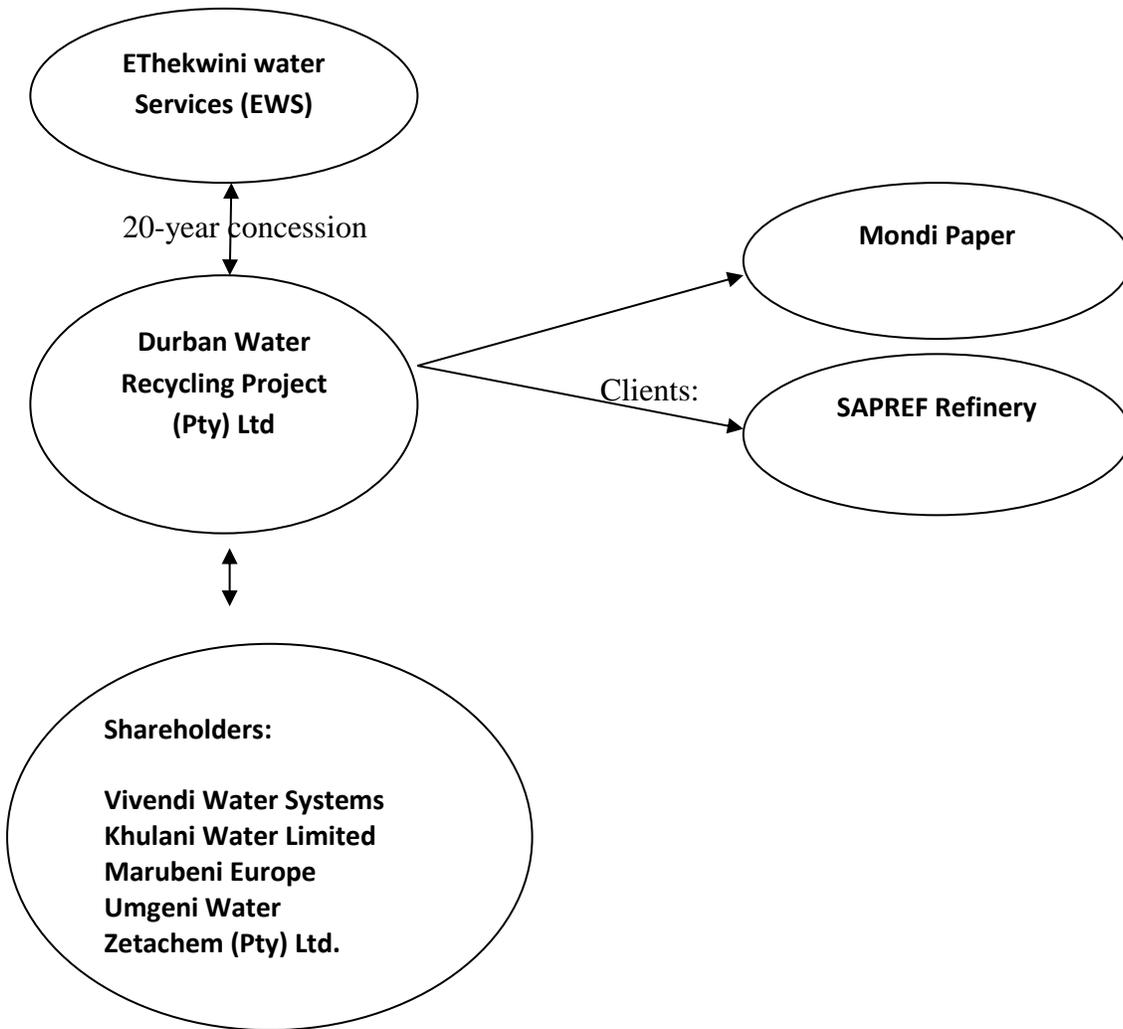
4.3 The Water Reclamation Plant: A PPP for water recycling in the eThekweni metropolitan municipality

The EThekweni Water Service (EWS) in 1998 invited proposals worldwide to pre-qualify prospective tenders for a 20-year concession contract to Design-Build-Finance-Operate-Transfer (DBFOT) the tertiary water treatment plant (Gisclon, 2002). When the announcement was made about the PPP, the majority of Durban Metro's industrial clients were interested in participating in the PPP and water recycling increased in that way.

The successful bidder was the Vivendi Water Systems consortium, made up of both foreign and local partners. These are: Vivendi Water Systems, Marubeni Europe and Zetachem (Pty) Limited, Umgeni Water and Khulani Limited. (Fischer, 2001 cited in Gisclon, 2002).

Figure 4.2 is (my own) schematic illustration of the respective partners in the PPP and the respective contractual arrangements that exist between the respective partners.

Figure 4.2: Contractual Arrangements of the PPP.



In 1999, a formal tender process resulted into a 20-year concession agreement and between EWS and Durban Water Recycling (Pty) Ltd (Gisclon, 2002). The latter is a special purpose vehicle (SPV) set up to manage the PPP. Durban Water Recycling Pty Ltd is responsible for designing, construction, financing and operating the reclamation plant. Thereafter, the plant will be solely owned by the eThekwini municipality in 2021. The SABS (1999) emphasizes that “the PPP is a 20-year concession and seeks to clean domestic sewage to a limited extent; industrial waste water at the new tertiary treatment works and treated water will be sold in high-volume to

consuming industries in the southern Durban industrial basin, substituting potable water currently consumed by these industries”. A 47.5Ml (Million litres) activated sludge plant was constructed and commissioned in 2001 for the production of near potable standard water for industrial use.

The PPP agreement is to allow construction and operation of a new water purification plant (the Durban Water Reclamation Plant) that seeks to treat domestic effluent supplied by Durban Metro to an acceptable standard use (Gisclon, 2002). The PPP agreement started in 2000 and was completed 14 months later (eThekweni municipality, 2011b). The building cost was R74 million which consisted of “upgrading the activated sludge PPP from 50 to 77 ml per day, the construction of the tertiary plant, tying in with pre-existing and decommissioned assets, refurbishment of the Southern Wastewater Treatment Works high-level storage tank and the installation of the reclaimed water reticulation system” (eThekweni municipality, 2011b).

The business model relies on local industries buying the recycled water produced by the plant which is also called grey water. Grey water is purified sewage water and is ready for secondary use like that in manufacturing such as Mondi Paper and SAPREF Refinery where it is used for paper purification and oil refinery respectively. Grey water is not clean enough for consumption, not potable water.

Policies and regulations at eThekweni municipality assist in water redistribution to local citizens. The eThekweni municipality seeks to apply water legislative and policy framework in order to provide water to all residences.

4.4 Management of the Durban Water Reclamation Plant PPP

The primary reasons for the PPP was informed by concerns, especially environmental concerns because of effluent being pumped into the ocean; service delivery concerns, with a growing population needing access to potable water; technical concerns and risk, because of their recognition that the municipality did not have the expertise to undertake such a project; and financial concerns, because the municipality could not afford such a project (Daryanani, 2011).

The eThekwini area had to restructure the institutional arrangements for the provision of water services in order to create feasible water service providers that will be accountable to the existing authorities (eThekwini Municipality, 2004d). According to Umgeni Water which is a partner in this project, eThekwini is committed to protect, conserve, efficiently use and sustain raw water resources, energy and chemicals in provision of clean and safe drinking water (Gisclon, 2002).

The Basic Assessment report from eThekwini municipality (2012a:10) looks at the concession between the partners as helpful in DWRP since it seeks to “maintain transparency, efficiency, and robust risk management procedures at all stages of planning, construction, operation, and decommissioning”. Furthermore, the agreement will be used for process and quality management “to increase accountability and transparency through competition and risk sharing” (eThekwini municipality, 2012a:33).

The management of the plant which is the Senior Operator is accountable for the control of the operation processes and making sure that high quality water is produced for the people and partnering companies (Gisclon, 2002). The process and maintenance sections of recycling process provide support to the operations function. The companies that are involved in a day to day recycling process are responsible in making sure that individuals and mutual success, close co-operation, co-ordination and reliance are compulsory. Operational sustainability needs integrated approach that is coming from all role players to manage the value chain (Gisclon, 2002).

Accountability is also required in the operational control of the system. The operational control process is attained through line monitoring with automated control actions that uses SCADA system to co-operate the plant (Gisclon, 2002). Therefore, the operational control is taken hourly and analyzed for process control and monitoring purposes. According to Gisclon, *et al*, the operational control logic of the plant is highly stable with consistent and predictable plant performance being achieved. Furthermore, the chemical usage have received high quality attention as the treatment has been reduced by 25% and the chemical dosage reduction was due to optimizing the performance of the lamella settlers (Gisclon, 2002).

Risk management associated with the operation of the plant is highly considered such as “commercial risk to Durban Water Recycling, Mondi Paper and SAPREF Refinery as well as the

more conventional risks associated with water and wastewater operations; comprehensive risk management programme with the aim of minimizing and mitigating the risks associated with this project to clients, the community, employees, the environment, partners and shareholders” (Gisclon, 2002:9).

The economic feasibility was not possible in 1997 when the Rand Merchant Bank evaluated the project. The eThekweni Water Services considered that the costs, technical complexity and the operational risks for this PPP were beyond their capacity. Therefore, the financial arrangements of the DWR PPP were funded by the Development Bank of Southern Africa (DBSA), Rand Merchant bank, Societe General, Natexis (two French banks). These investors covered all the costs, upgrading, new technology investments (Daryanani, 2011). Veolia Water Services leases the land from the municipality, and sells processed wastewater to Mondi Paper and SAPREF Refinery after cleaning it up and keeps profit. Mondi Paper and SAPREF Refinery signed a 20-year consumer contracts and the 20-year recycling plant operating contract with Vivendi Water Systems (Gisclon, 2002). At the end of 20 years the infrastructure will be taken back to eThekweni municipality and will fully own the Reclamation plant, and will directly sell processed wastewater to Mondi Paper, SAPREF Refinery and other customers.

4.5 PPP Agreements for Governing the Durban Water Recycling (Pty) Ltd.

The Durban Water Recycling Plant has about nine treatment processes. Gisclon, *et al*, explains the whole treatment process as follows:

- First, the preliminary and primary wastewater treatment process has a number of stages that includes; screening, degritting and primary settling (Gisclon, 2002). The eThekweni Water Services facilitate the operation of these processes. Effluent is fed from the primary settling tanks to the activated sludge plant controlled by Veolia Water Services which need to work with 32 contractually specified parameters.
- The second process activated sludge “is of conventional design and serves to remove 95% of the incoming Calculated Oxygen Demand (COD) and 98% of the incoming

ammonia loads and consists of concentrations of 15 mg/l and 0.2 mg/l respectively” (Gisclon, 2001:4).

- The third process is lamella settling where ferric chloride is used to remove phosphate and lime is added to enhance the flocculation process at 60 degrees, moving at the speed of 20m/hr.
- The fourth process is polyaluminium chloride (PAC) dosing which is mixed into the water to remove iron to 0.04mg/l.
- The fifth process the PAC process is followed by dual media filtration which is the last solids barrier in the process of water purification where iron precipitates are completely removed.
- The sixth process is ozonation crack the remaining non-biodegradable organic compounds, like colour causing compounds.
- The Granular Activated Carbon (GAC) Adsorption the seventh process acts as a polishing step and removes ozone degraded organics, the carbon type used is Picobio and eight-to-ten year’s bed life is expected to last.
- The second-to-last process is chlorination which makes sure that there is no biological re-growth in the reticulation system or within Mondi Paper and SAPREF Refinery’s processes but only 0.8 mg/l of free chlorine residual is sustained at the point of reclaimed water use.
- The last process of the treatment is the reticulation process where “chlorinated reclaimed water is pumped to the 21MI high level storage tank before distribution to Mondi Paper and SAPREF Refinery” (Gisclon, 2002:6). During this process, reclaimed water supply of potable water is available for two reasons: “to ensure the continuity of supply if the water demand by Mondi Paper and SAPREF Refinery exceeds the wastewater volume available for treatment and for blending purposes, should the quality of the reclaimed water be deficient in any parameter as a result of feed water non-compliance or inadequate treatment” (Gisclon, 2002:6).

In short, this is a highly technical process. The “wastewater cycle encompasses activities such as wastewater catchment, conveyance, trade effluent control, preliminary and primary treatment, secondary and tertiary treatment, reclaimed water reticulation and finally utilization” (Gisclon,

2002:8). Figure 4.4 and 4.5 provide photographic illustration of the EWS sewage water treatments works, and the Durban Water Recycling Plant.

Figure 4.4: Top view of the Durban Water Recycling Plant that produces 47.5 MI/ day, situated in Durban south in the grounds of the EWS sewage water treatment works (SWTW).



Source: Veolia Water Technologies, 2014

Figure 4.3: The Durban Water Recycling treats domestic and industrial sewage and wastewater to near potable standards for use in industrial processes



Source: Veolia Water Technologies, 2014.

4.6 Benefits from the PPP

The Plant assisted in reducing the quality of effluent that is released into the environment. The Plant frees up sufficient drinking water for about 300 000 citizens (Bhagwan, 2012).

The Head of Water and Sanitation emphasized that industries will reduce its costs by accessing less expensive water and it will free-up water to extend services to the impoverished (eThekweni municipality, 2011b). The Deputy Head of Technical Support in Water Services said “the city benefits because it gained the infrastructure without having to put a rand on the table” (Robbins, 2004). The new plant was able to process more 47 000 cubic meters of water per day to be supplied within the Durban area (Gisclon, 2002).

The PPP has provided the municipality with a Water Reclamation Plant that can recycle water, save energy, money, land, and can create jobs and lead to infrastructure development (Parliament Liaison Office, 2010). Also, the benefits are not limited to recycling water but businesses and customers can save in user fees making more potable water available to provide free water for household consumption. The municipality was able to save half a million rand per month as a

result of this PPP and did not have to spend any resources on the actual infrastructure construction of the Reclamation Plant (Lodi, undated: 5).

The success of the PPP was dependent on the clear vision of eThekweni Treatment Water (ETW) in initiating the project, while “Vivendi’s ability to provide finance and to implement innovative, tailor-made technical solutions and Mondi Paper endorsement of the PPP, by committing its entire paper production at its Merebank Mill to recycled water” (eThekweni municipality, 2011b).

From the experience of the DWR PPP there are lessons to be learnt that could be beneficial to other municipalities. According to Lodi (undated, 6) these lessons are that “good management and leadership skills are crucial, good negotiation skills are key in ensuring such high-level partnerships, municipal representatives must have the authority to make decisions on the spot, international exposure can be useful when negotiating such high profile projects, the ability to justify risks taken is important, the ability to manage political sensitivities are vital, the importance of pursuing a win-win results within a partnership and, visionary and long-term thinking is crucial”. On the 25th of July 2001, the Minister of Water Affairs and Forestry, expressed his high hopes about the PPP that “it will serve as a lesson throughout South Africa and that it will move forward to a cleaner, more sustainable and more rightful future in South Africa” .

Royal Haskoning HDV (2014:10-11) identified socio-economic benefits in their paper entitled “Water Reclamation Project in an environmentally stressed area” (the paper was presented at the Biennial Conference of the Water Institute of Southern Africa (WISA) in 2002). The benefits identified were:

- When the Reclamation Plant was built, there were benefits to the local economy through the employment of local labor and contractors;
- About 15 local people were contracted in sustainable employment to operate and maintain the plant;
- There was a capital investment for future potable water supply infrastructure, with a greater volume of treated water now being available for potable use;

-
- The project was financially sustainable, with all finance being made available from private banks and a French soft loan programme, which was therefore at no cost to the local taxpayer;
 - The potable water price increased at a slower rate because investment in potable water production would be delayed by 3000 m³/d and that water which industries were using was now made available for domestic use;
 - Tax on every cubic meter of reclaimed water sold to industries increased long-term water revenue to eThekweni Water Services.

According to Gisclon *et al*, the PPP has five achievements so far: First, is the sustainable development of water resources. Through sustainable development it means “the Reclamation Plant will meet 7% of the city’s current potable water demand and will reduce the city’s treated wastewater output by 10%” (2002:10). According to South African Bureau of Standards Specification Drinking Water, “the recycled water produced by the plant meets or exceeds the South African Class 1 potable water standard in 96% of the parameters measured and the Class 1 potable water standard gives the quality of water that is known to be acceptable for whole lifetime human consumption” (1999:241).

Now there is no need to invest in major bulk water supply and treatment infrastructure since potable water that is available for redistribution to previously disadvantaged and semi-urban communities is sufficient. In 2001, it was suggested that water supply schemes to the urban poor can be used to prolong water supply up to 220 000 households in the greater Durban area. In all this, the PPP seeks to protect and make sure that sustainable development is achieved to supply available water resources to the city. The reclamation plant has been able to preserve natural water resources through the process of recycling.

Secondly, the PPP achieved environmental pollution load minimization as it treats 470 MI of wastewater. The Plant is environmental friendly. The DWR (Pty) Ltd decreases water pollution generated by the area’s population as it generates low-cost resource for industry. The new plant was able to reduce high industrial consumption of potable water and minimize sewage that is released into the environment. More sewage is treated. Mondi Paper and SARPREF Refinery gain as they buy grey water from Veolia at a cheaper price. Veolia Water will also gain

extensively as Veolia Water is cheaper and allows a significant operating cost (Gisclon, 2002). According to Gisclon, *et al*, findings, the reclamation plant reduces the city's total treated wastewater discharge by 10% and reduces the partially treated load on the marine environment by up to 24%" (2002:10). The environmental achievement in waste minimization was successful through innovative internal recycling of waste streams.

Thirdly, the PPP achieved technical innovation. Technical innovation involves water treatment steps of highly specialized processes designed to meet the exacting water quality requirements of Mondi Paper. The significant technical achievement of the PPP is the treatment of raw wastewater from domestic and industrial sources to a potable standard that is reasonable. The reclamation plant involves process engineering for production of portable recycled water. The fourth achievement is partnership. The flagship of the PPP has been the innovative institutional arrangements for the management and execution of the PPP (Gisclon, 2002).

The last remarkable achievement is the economic environment of the PPP. This is due to that the EWS "delayed capital investment for increased marine outfall pipeline capacity; delayed capital investment for future bulk potable water supply infrastructure; no capital investment for the construction of the recycling plant; creation of a long term revenue stream from a levy raised on the production of recycled water; and consequent reduced cost of water services to Durban's citizens" (Gisclon, 2002:12).

4.7 Conclusion

According to the documentary evidence gathered on this PPP, it appears to be largely successful and an outstanding example of a mutually beneficial PPP in South Africa. The PPP demonstrates a true partnership between the public and private sector and the success of the partnership was dependent of the mobilization of the inherent strengths of both sectors" (Bhagwan, 2012:2). For Gisclon, *et al*, (2002:1) the PPP "is an outstanding example of a public-private partnership that harnesses the synergies of the partners to achieve an outcome that is unprecedented in the water industry in South Africa".

According to Frost and Sullivan (2008:5) "the PPP is an outstanding example of a PPP that demonstrates an innovative approach to several challenges relating to water resource

management” . The Durban partnership allows what the government and private sector to offer what they are best doing. This process helps in achieving desired outcomes in partnership (Frost and Sullivan, 2008). The implementation of PPP has changed the perspective of how industries view wastewater treatment in South Africa since sewage is regarded as beneficial resource encourage many new plans which have allowed innovation and technology (Bhagwan, 2012).

The PPP is a “major example of how innovative approaches to water resources and environmental management, wastewater treatment technology and institutional arrangement can yield exceptional results” (Gisclon, 2002:15). It harnesses the energies of the partners and highlights the potential role that the private sector can play in water management, treatment and distribution” . According to the minister of Water Affairs and Forestry, the Durban Metro stands to be proud by providing free basic water way before it became a policy in the National government. This 20-year concession contract was the first PPP of its kind in South Africa; also the PPP broke new ground in its approach to manage and implement water PPP and may be regarded as a model for future PPPs in South Africa and anywhere (Bhagwan, 2012).

The PPP gives a lesson as a model for how should partnerships proceed. The PPP is celebrating thirteen years of existence and still has positive results and continues to be outstanding PPP. As a result of what make the PPP works, is that it “has been recognized by the industry and has received awards from the South African Institute of Civil Engineering, the South African Association of Consulting Engineers, and the Water Institute of Southern Africa” (eThekwin municipality, 2006c:63). Furthermore, this innovative project is the recipient of three awards in South Africa:

- South African Institution of Civil Engineering (Durban Branch Award): 2001 Award for Technical Excellence in Civil engineering;
- South African Institute of Civil Engineering (National Award): 2001 Award for Technical Excellence in Civil Engineering
- South African Association of Consulting Engineers 2001 Visionary Client of the Year

To conclude, this chapter has demonstrated the rationale behind the municipality’s decision to undertake a PPP arrangement to build the Durban Water Reclamation Plant. The need for PPPs

was due to lack of government infrastructure especially in the provision of water in the eThekweni metropolitan municipal area. The municipality was not able to build and expand the reclamation plant on its own due to lack of funds and resources, hence its decision to call for tenders for designing, construction, financing and operating the reclamation plant. The implications of this decision have resulted in governance responsibilities.

CHAPTER FIVE

Conclusion

Literature indicates that government alone does not have full capacity to deliver all services. Therefore, PPPs are seen as a new form of governance. PPPs can contribute to good governance if it promotes transparency of information, accountability of government to deliver services to all citizens, responsiveness to human needs, increases competitiveness for economic growth, and increases the effectiveness and efficiency of governance in service delivery. This study shows that governance focuses on getting things done not as a government responsibility alone but also for private sector involvement by providing new tools, techniques and guides for service delivery.

Abdellatif (2003) argues that governance in functioning and capability of public and private sector business is to focus on the accountability for economic and financial performances, and regulatory frameworks for partners. Demand side management is a critical part of the approach to ensuring a more sustainable use of resources. In the case of DWR PPP, whole catchment management (including areas that fall outside of the municipal area) as well as efficient nature conservation programmes will help to ensure that there is an adequate supply of clean water in the eThekweni Municipality.

This study has shown that PPPs can be considered by government as an additional way of providing and delivering public services in South Africa. It has been illustrated that PPPs are a governance approach commonly practiced in counties that have adopted New Public Management (NPM) systems. This study has shown that PPPs can play a key developmental role in South Africa as proposed by Kasrils (2001). Out of the findings of this research it has become apparent that PPPs are a strategy for service delivery in South Africa which government should be supportive of.

This particular study is not the only example of a PPP that is contributing meaningfully to the treatment of wastewater, and provision of water in a municipal area. There are other South African PPPs in the water sector that look promising. For example, the Department of Water Affairs is noting early positive results at Mbombela (Nelspruit) Water and Sanitation, Sasol

synfuel wastewater treatment in Secunda, Sun City wastewater treatment in North West and Nedbank Olwazini in Midlledrift, Gauteng.

The Durban Water Reclamation PPP serves as a good example for the water sector that industrial and potable water can be produced from a successful PPPs. Government have saved lots of money and enough water to supply to eThekweni municipality and resources to supply water as a result of private sector involvement. Government should invest in PPPs on wastewater treatment in South Africa. This will serves future generation to have clean and safe drinking water. The Durban Water Reclamation Plant PPP is a model for future PPP in South Africa.

The Durban Water Recycling PPP has a number of benefits and advantages. Benefits and advantages are that the PPP “has delayed capital investment for increased marine outfall pipeline capacity and also delayed capital investment for future bulk potable water supply infrastructure” (Bhagwan, 2012:105). Mondi Paper benefit by saving 50 percent of normal industrial water tariff. The lessons that can learnt in this PPP is that true partnerships between public and private sector can yield fruitful results and is dependent on the mobilization of the inherent strengths of both sectors. The PPP “demonstrates that innovative approaches to water resource management, environmental management, wastewater treatment technology and institutional arrangements can yield positive results” (Gisclon, 2001:15). The production of potable recycled water from domestic and industrial wastewater indicates a successful continuously and reliable results on water process technology and process engineering. This research discovered that PPPs work if all parties have shared objectives. There are no existing challenges presented in the Durban Water Recycling PPP.

The application of PPPs in South Africa is not only limited to wastewater treatment as it was discussed in the paper but also extends to empowering black businesses. The South African government is committed to take Black Economic Empowerment (BEE) in PPP forward “to lower the cost of capital to Black Shareholders in PPPs, to support independent financial and legal advice to Black Enterprises bidding for, negotiating and implementing PPP projects; and to establish an internship programme to grow the number of experienced Black Transaction Advisors in South Africa’ s PPP market” (National Treasury, 2004:27). The implementation of BEE measures will contribute to establishment of PPPs as a contributor to South Africa’s BEE

over the coming years. South African PPP are set to take BEE to advanced level as a key for evaluating a private party's bid.

PPPs in South Africa can offer high investments in infrastructure such as bridges, roads, railways and water sector. PPP in South Africa can offer facilitation of infrastructure delivery as stated under the Accelerated and Shared Initiative for South Africa (Asgi-SA) (National Treasury PPP Unit, 2007). According to National Treasury PPP Unit (2007), PPP can deliver better value for money than traditional procurement. There are a number of reasons why PPPs are used in South Africa, which includes leveraging private party capital to fund infrastructure development; leveraging sector skills offered by private sector; assisting in project planning that is in line with strategic delivery responsibilities; allows private sector to take financial risks on the lifecycle of the project; and allowing to delivery budgetary certainty on the future costs of PPP projects. PPPs can also force the public sector to focus on the outcomes and the benefits from the start of a project by focusing on the quality of service rendered which needs to be maintained for the duration of the PPP; and lastly, allows private sector capital to make sure that a project viable and remains on track until the end (National Treasury PPP Unit, 2007).

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