

**An Investigation into the use of existing Public – Private Partnerships
Models in the Zambian Water and Sanitation Sector.**

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A DOCTORATE THESIS

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Abstract

A PPP concept has become one of the preferred strategic option used world over in the delivery of public services though still considered as a developing concept. In this study, it has been used as a tool for value addition and enhancement of service delivery as opposed to it being a financing strategy. The aim of the research was “to investigate into the use of existing PPP Models in the Zambian Water and Sanitation Sector (WSS) for increased effectiveness.”

A quantitative research methodology was used to investigate the extent to which existing PPP Models could increase effectiveness through dimensions of cost, time and quality. Descriptive statistics and content analysis methods were used to analyse the data. Results indicate that all the existing PPP Models can be used to increase effectiveness of dimensions of cost, time and quality though at different levels of impact based on mean values. A Conceptual Beta Model has been developed based on the adopted existing PPP Models, the independent factors of cost, time and quality and peripheral aspects that arose from the interview survey.

The sample was drawn from existing water utility companies, councils and other related stakeholders in Zambia. The data collection included literature review, questionnaires and follow up semi-structured interviews with PPP experts in Zambia. A Conceptual Alpha Model was first developed and subjected to further research prior to developing a Conceptual Beta Model. The Conceptual Beta Model aims to provide a basis for existing PPP Model increased effectiveness in the Water and Sanitation Sector and has been proposed for operationalization. The study provides a greater understanding of how existing PPP Models can be used to increase effectiveness through dimensions of cost, time and quality thereby providing tangible benefits in as far as the provision of water and sanitation services in Zambia is concerned.

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Table of Contents

Content	Page
Abstract	i
Acknowledgement	ii
Table of Contents	iv
List of Tables	ix
List of Figures	xi
List of Abbreviations	xiv
Chapter One	
1.0 Introduction.....	1
1.1 Background to the Research	6
1.2 Evolution of Water Supply and Sanitation Sector	13
1.3 The Public-Private Partnership Act and Policy in Zambia	20
1.4 Research Focus	22
1.5 Research Aim and Objectives	22
1.6 The Research Approach	24
1.7 Intended Contribution	27
1.8 Thesis Chapter Outline	27
Chapter Two	
2.0 Literature review	29
2.1 Introduction.....	29
2.2 The Public – Private – Partnership (PPP) concept.....	30

2.2.1	The Case for Europe	37
2.2.2	The Case for Asia.....	47
2.2.3	The Case for America.....	53
2.2.4	The Case for Western and Central Africa.....	54
2.2.5	The Case for Southern Africa	56
2.2.6	Reasons/benefits and arguments behind PPPs	60
2.2.7	Summary Conclusions	68
2.3	PPP models/schemes	70
2.3.1	Long-term Concessions (20 – 30 years)	70
2.3.2	Affermages/Lease contracts (10 – 20 years)	71
2.3.3	Management contracts (5 – 10 years).....	72
2.3.4	Performance-Based Service contracts (less than 5 years)	73
2.3.5	Summary Conclusion	75
2.4	Structuring a PPP, PPP models implementation and their performance.....	76
2.4.1	Structuring a PPP	77
2.4.2	PPP models implementation	80
2.4.3	PPP model performance	81
2.5	Review of the Asset Holding Company Water and Sanitation Management contract performance in Zambia	88
2.6	PPP models applied to Water and Sanitation sectors in developed and developing countries	90
2.7	Application and relevance to the Zambian Case	91
2.8	Literature synthesis.	92
2.8.1	Introduction	92
2.8.2	Literature Synthesis	92
2.8.3	Summary	100

Chapter Three

3.0	Research methodology	102
3.1	Introduction.....	102
3.2	The research paradigm and theoretical framework	103
3.2.1	Competing paradigms	104
3.2.1.1	Positivism	107
3.2.1.2	Interpretivism	108
3.3	Methodology adopted	108
3.4	Sample selection and size	111
3.5	Data collection procedures	112
3.5.1	Questionnaire survey	112
3.5.2	Semi-structured interviews	113
3.5.3	Collaborative information on both questionnaire and interviews..	115
3.5.4	Piloting of data collection instrument	116
3.5.5	Reliability and Transferability	116
3.5.6	Ethics and Accessibility	117

Chapter Four

4.0	Data Analysis and Presentation of Results	119
	PART A: Questionnaire survey	119
4.1	Introduction	119
4.2	Questionnaire: Results, Analysis and Discussion	121
4.2.1	Part A: General information	121
4.2.2	Part B: Public-Private Partnerships information	126
4.2.3	Most Suitable Ranked Model	135
4.2.4	Proposed Propositional Model of Increased Effectiveness	138
4.2.5	Part C: Factors or Measures of PPP Models Effectiveness	140
	4.2.5.1 Existing PPP Models at Most Suitable Level Rated for Increased Effectiveness using Cost dimension..	142

4.2.5.2 Existing PPP Models at Most Suitable Level	
Rated for Increased Effectiveness using Cost dimension..	151
4.2.5.3 Existing PPP Models at Most Suitable Level	
Rated for Increased Effectiveness using Cost dimension..	156
4.2.5.4 Part C Summary	161
4.2.6 Part D: Respondents further comments	161
4.3 Development of Conceptual Alpha Model for increased effectiveness...	164
4.3.1 Conceptual Alpha Model	167
4.3.2 Summary and Conclusion of Section 4.3 above	172

PART B: Semi – Structured interviews

4.4 Introduction	174
4.5 Knowledge levels of PPPs	174
4.6 Sectors in which PPPs have been implemented, in Zambia or elsewhere and whether they have been successful	176
4.7 Main benefits/demerits of introducing PPP models in the Zambian WSS to both public and private sectors	179
4.8 How the adoption of existing PPP Models could increase Effectiveness	183
4.9 Main sources of funding to the water and sanitation sector development in Zambia	186
4.10 What government could do to attract private sector participation.....	189
4.11 Major obstacles to attracting private sector participation and how to overcome them	189
4.12 Guidelines, policies or legislation available in Zambia to facilitate the introduction of PPPs and whether sufficient	190
4.13 Development of an Interactive Process Model	191
4.14 Summary and conclusion	194

Chapter Five

5.0 Conceptual Beta Model for existing PPP Model for Increased Effectiveness in the Zambian Water & Sanitation Sector	197
5.1 Introduction	197
5.2 Logic and Reasoning in Developing the Conceptual Beta Model	197
5.3 Summary Model Structure	199
5.4 Development of Beta Model	202
5.5 Discussions and conclusion	205
5.5.1 Operationalizing the Proposed Conceptual Beta Model	206

Chapter Six

6.0 Summary, Conclusions and Recommendations for future Research.	212
6.1 Summary of Research	212
6.2 Limitations of the Research	219
6.3 Conclusions	220
6.3.1 Intended Contribution	222
6.4 Recommendations for Future Research	223
References and Bibliography.....	225
Appendix 1: Glossary of Terms.....	234
Appendix 2a: Piloted Questionnaire Survey for Comments	238
Appendix 2b: Sample Questionnaire Survey instrument.....	241
Appendix 3a: Piloted Interview Survey for Comments	249
Appendix 3b: Sample Interview Survey instrument.....	250

List of Tables

Table 1.1	Ground Water Potential in Zambia (All values in millions cubic metres)....	8
Table 1.2	Budget performance for water and sanitation 2006 – 2008	12
Table 1.3	Seven sector principles from the National Water Policy 1994 and 2010 as adopted by government.....	14
Table 1.4	Water supply and sanitation for each CUs by population and coverage.....	15
Table 1.5	SADC states access to clean water supply and sanitation	16
Table 1.6	Chronology of the evolution of the Water Supply and Sanitation sector....	17
Table 2.1	Evolution of European PPPs per annum	38
Table 2.2	Five broad headings of PPPs	41
Table 2.3	The genesis of PFI	43
Table 2.4	PFI signed deals by department as at 1 September 2001	44
Table 2.5	UK experience of PFI	45
Table 2.6	Differences between PFI and PPPs	46
Table 2.7	Water PPP Experience in Western and Central Africa	55
Table 2.8	Mean scores and rankings of the reasons for implementing PPP projects..	63
Table 2.9	Positive and negative factors of PPP as summarised by Bing Li, A. Akintoye, P.J. Edwards & C. Hardcastle.	66
Table 2.10	Reasons for uncertainty in economic and financial benefits of PPPs	67
Table 2.11	PPP models based on options/arrangements	74
Table 2.12	Coverage and connection ratios in Western and Central Africa	83

Table 2.13	Summary findings of countries with PPPs on track to achieving the MDGs.....	83
Table 4.1	Respondents company/Organisation/Institution or sector	122
Table 4.2	Mean Values and Ranking Position for Most Suitable PPP Models	136
Table 4.3	Cost Attributes presented according to their level of significance	143
Table 4.4	Mean Values and Ranking Positions of Cost Attributes according to contribution to Cost Effectiveness	146
Table 4.5	Mean Values and Ranking Positions of Time Attributes according to contribution to Time Effectiveness	153
Table 4.6	Time Attributes presented according to their level of significance	154
Table 4.7	Mean Values and Ranking Positions of Quality Attributes according to contribution to Quality Effectiveness	155
Table 4.8	Quality Attributes presented according to their level of significance	159
Table 4.9	Additional Suggestions provided by respondents' on increased effectiveness	163
Table 4.10	Factors and their respective attributes and Mean Value Rankings	165
Table 4.11	Summary Mean Values Categories for Cost, Time and Quality Attributes Based on Mean Value Rankings and Weighting.	166

List of Figures

Figure 1.0	Figure 1.0: Map of Zambia in yellow with Districts, Commercial Utilities, Lakes and Rivers	xvii
Figure 1.1	Zambia population density Vs. population	8
Figure 1.2	Institutions in the WSS sub-sector (NWASCO 10 years of regulation).....	19
Figure 1.3	The proposed research methodology	26
Figure 2.1	Values of PPPs financed by European Investment Bank	40
Figure 2.2	Generic PPP Project sequence	79
Figure 3.1	Understanding the research philosophies and approaches: – the research onion.....	106
Figure 4.1	Response Data of Question A1	123
Figure 4.2	Response Data of Question A2	124
Figure 4.3	Response Data of Question A3	125
Figure 4.4	Response Data of Question B1	126
Figure 4.5	Respondents knowledge of PPPs implementation in various sectors based on absolute number	128
Figure 4.6	Respondents knowledge of PPPs implementation in various sectors based on percentages	129
Figure 4.7	Ranking of PPP Models in order of their suitability based on absolute numbers.....	131
Figure 4.8	Ranking of PPP Models in order of their suitability based on percent.....	132
Figure 4.9	Ranking Trends of each PPP Model in a Progressive Manner	135

Figure 4.10	Most Suitable ranked PPP Model	136
Figure 4.11	Proposed Propositional Model of Increased Effectiveness	139
Figure 4.12	Ranking Positions Plotted against Mean Values – Cost.....	147
Figure 4.13A	Respondents rating of each Cost Attribute (absolute).....	148
Figure 4.13B	Respondents rating of each Cost Attribute (absolute)	149
Figure 4.13C	Respondents rating of each Cost Attribute (percentage).....	150
Figure 4.14	Ranking Positions Plotted against Mean Values – Time	153
Figure 4.15	Respondents rating of each Time Attribute	155
Figure 4.16	Ranking Positions Plotted against Mean Values – Quality	158
Figure 4.17	Respondents rating of each Quality Attribute.....	160
Figure 4.18	Additional Attributes of increased effectiveness	162
Figure 4.19A	Conceptual Alpha Model using attributes that increases Cost, Time and Quality effectiveness at various Mean Values using Existing PPP Models – Level: High impact	169
Figure 4.19B	Conceptual Alpha Model using attributes that increases Cost, Time and Quality effectiveness at various Mean Values using Existing PPP Models – Level : High impact	170
Figure 4.19C	Conceptual Alpha Model using attributes that increases Cost, Time and Quality effectiveness at various Mean Values using Existing PPP Models – Level: High impact	171

Figure 4.19D	Conceptual Alpha Model using attributes that increases Cost, Time and Quality effectiveness at various Mean Values using Existing PPP Models – Level: High impact	172
Figure 4.20	Knowledge levels of identified PPP Modes	175
Figure 4.21	Determining successfulness of PPP Models	178
Figure 4.22	Main benefits of introducing PPP Models in favours of public sector.....	180
Figure 4.23	Main benefits & demerits of introducing PPP Models in favours Private sector	181
Figure 4.24	Relationship amongst Cost, time and quality effectiveness	185
Figure 4.25	Main sources of funding in Zambian Water & Sanitation Sector.....	187
Figure 4.26	Interview Interactive Process Model	193
Figure 5.1	Summary Model Structure – Linking Models towards the development of the Beta Model and interrelationships amongst tem	200
Figure 5.2	Conceptual Beta Model with attributes that increases cost, time and quality effectiveness, overall effectiveness and peripheral aspects	203
Figure 5.3	Summary Conceptual Beta Model – showing relationships between cost, time and quality effectiveness, overall effectiveness and peripheral aspects of PPPs	204

List of Abbreviations

AAET	American Anglian Environment Technologies
ADB	African Development Bank
ADB	Asian Development Bank
AHC	Asset Holding Company
AU	African Union
AU	Audit Unit
BOO	Build, Own, Operate
BoP	Balance of Payment
BOOT	Build, Operate, own and Transfer
BOTT	Build, Operate, Train and Transfer
BTO	Build, Transfer and Operate
CAET	Chartered Accountants Education Trust
CFL	Channel Fixed Link
CHT	Cross Harbour Tunnel
CSO	Central Statistics Office
CUs	Commercial Utilities
ChWSC	Chambeshi Water and Sewerage Company
DCMF	Design, Construct, Manage and Finance
DBFO	Design, Build, Finance and Operate
DFO	Design, Finance and Operate

DTF	Devolution Trust Fund
DWA	Department of Water Affairs
EVM	Earned Value Management
FNDP	Fifth National Development Plan
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
IWRM	Integrated Water Resources Management
LAs	Local Authorities
MDGs	Millennium Development Goals
MEWD	Ministry of Energy and Water Development
MLGHEE	Ministry of Local Government Housing and Early Education
MOFNP	Ministry of Finance and National Planning
MU	Monitoring Unit
NGOs	Non-Governmental Organizations
NRW	Non-Revenue Water
NRWSSP	National Rural Water Supply and Sanitation Programme
NWASCO	National Water and Sanitation Council
NWSC	Nkana Water and Sanitation Company
PCI	Per Capital Income
PCU	Program Coordinating Unit
PFI	Private Finance Initiative

PPPs	Public Private Partnerships
PPP Unit	Public Private Partnership Unit
PSC	Public Sector Comparator
RIMOT	Rehabilitate, Improve, Maintain, Operate and Transfer
SADC	Southern African Development Corporation
SEM	Structural Equation Modelling
SNDP	Sixth National Development Plan
SPV	Special Purpose Vehicle
SRM	Social Rehabilitation and Maintenance
TWO	Treated Water Outsourcing
UK	United Kingdom
USA	United States of America
VFM	Value for Money
WRDM	Water Resources Development and Management
WRM	Water Resources Management
WSPIP	Water Sector Performance Improvement Project
WSS	Water Supply and Sanitation
WSSS	Water Supply and Sanitation Sector
ZAWAFE	Zambia Water Forum and Exhibition
ZCCM	Zambia Consolidated Copper Mines

Figure 1.0: Map of Zambia in yellow with Districts, Commercial Utilities, Lakes and Rivers



● Water utilities companies in Zambia

• Districts in Zambia

Chapter One

1.0 Introduction

This research has been motivated by the absence of Public – Private Partnerships (PPPs) in the Zambian water sector, in particular the Water Supply and Sanitation (WSS) sub - sector. Globally, developed countries such as the United Kingdom (UK), France, Japan and Singapore; the BRIC countries like China and India and other rapidly /or developing Asian countries such as Indonesia, Malaysia, South Korea, Hong Kong, Australia and Thailand among others have generated a lot of interest in PPPs in their quest to generate additional sources of capital and/or as a means of enhancing value for money for enhanced public service delivery.

According to ONG (2003), PPPs have been implemented in many industrialised and developing countries as a tool for social and economic development. For instance, concessions contracts in UK date as far back as the 16th Century and as awarded by James 1 of England (Li, 2003) whereas those in France date as far back as the 1940s (ACCA, 2012). Similarly, African countries such as those in the Western, Central and Southern regions have also generated similar interest in their quest to raise additional resources other than those generated internally and as needed for sustainable social and economic development. For instance, in Western and Central Africa alone, Côte d'Ivoire has had a successful partnership dating as far back as 1959 and many countries in the same region have experienced with PPPs in both water supply and combined power and water supply (Fall et al., 2009).

Given the changing economic, social and political environment, coupled with globalisation and budget constraints, PPPs have become unavoidable and indeed desirable in many countries worldwide (School of Built & Natural Environment, 2011). The need for PPPs in many countries has therefore been exacerbated by the public sector's recognition of the vital role of modern infrastructure in economic growth thus accepting PPPs as an important avenue for funding major public sector infrastructure projects. On the basis of this trend, it is discernible that in many developed and developing countries, there has been a move towards increased reliance on PPPs for infrastructure development. PPPs are now commonly used to

accelerate economic growth, development and infrastructure delivery and to achieve quality service delivery and good governance (School of Built & Natural Environment, 2011).

Zambia, in particular, like many other developing countries whose Gross Domestic Product (GDP) and Per Capital Income (PCI) cannot sufficiently support the required social and economic development is not an exception. Other than its meagre internally generated resources, she has to rely on outside support in order to enable her provide the needed social amenities aimed at enhancing public service delivery in an efficient and effective manner. The need to find additional resources as a way of supplementing internally generated funds therefore arises and one such option is to go the partnership way by partnering with the private sector. This could allow accessibility to benefits such as private finance to supplement shortfalls in government spending on infrastructure and related activities and skills and technology that come with the undertaking and aimed at enhancing performance. The need for additional resources is also evident from the financing deficits normally projected in the Ministry of Finance and National Planning (MOFNP) yearly budgets (MOFNP, 2008a). These come in the form of Balance of Payments (BoPs) support which is an indicator of the general economic performance of a country or trading flows with the rest of the world.

Generally, there has been a shift from public to private finance for the delivery of infrastructure projects or related services around the world. This is true in that the growing awareness of the difficulties and limitations of public funding for infrastructure development have led to many governments to utilise private finance as a financing tool (ONG, 2003). In this context, private finance may be raised through a PPP/Private Finance Initiative (PFI) where both the private and public sectors agree to collaborate on a number of issues. ONG (2003) reports that the provision of infrastructure facilities under public leadership in many countries has resulted in serious and widespread misallocation of resources, poor performance and failure to respond to demand. The private sector involvement therefore assists in the reduction of the finance burden of government, encourages better risk sharing, accountability, monitoring and management. The involvement of the private sector in the delivery of public service is not therefore a new phenomenon (Ghobadian et al., 2004, p. 1; Nisar, 2007) and constitutes an important pedagogical factor.

While the PPP/PFI concept has been used across continents, it has been used judiciously in Europe for a number of years as a means of enhancing public service delivery (ACCA, 2012; PartnershipsUK, 2012; HM-Treasury, 2012; Nisar, 2007; Ghobadian et al., 2004; Allen, 2001). It has been implemented mostly in sectors such as transport, energy, power and water combined; education, health, services, water and sewerage etc. The PFI origin in particular and its subsequent transformation into PPP and/or as a component of PPP have been addressed in chapter two (literature review) in order to demonstrate the concept of PPP from the common perspective.

Although Zambia has engaged herself in some form of PPPs in the transport, construction and energy sectors among others, it has not been the case in the WSS sector. This is despite many developed and developing countries venturing into a number of PPPs (including those in the water sector) as a strategic option aimed at enhancing public sector performance in terms of service provision and delivery (ACCA, 2012; Fall et al., 2009; Ghobadian et al., 2004; ONG, 2003). While the provision of water and sanitation in Zambia has been commercialised by forming limited companies across the country, (normally in provincial Centres) with the various City, Municipal and District Councils being the sole shareholders under the jurisdiction of the Ministry of Local Government Housing (MLGH), the initiative has not yielded much of the desired results. This is due to the fact that the water utility companies are under capitalised and depend on grants or subsidies from the parent ministry and other partners such as the World Bank.

The major source of financing has therefore been budget/project support through grant and loans from mostly cooperating partners such as Germany, African Development Bank, Denmark, Japan and World Bank (Zambia Daily Mail Limited, 2013; Zambia Daily Mail Limited, 2012; JICA, 2012). In order to supplement donor support, the researcher believes that the effective use of PPP Models as strategic tools in the Zambian WSS sector could sufficiently assist in the enhancement of the country's performance from the social, economic and political development point of view. Li (2003) notes that the concept of PPP has developed as an important procurement method for delivering public services in both developed and developing countries and classifies them as Service contract partnerships, Leasing contracts, Public Private Joint Ventures, Concessions contracts and Privatisation. Fall et al. (2004) have alluded to similar procurement methods. They can also take the form

of Design, Build, Finance and Operate (DBFO), Design, Construct, Manage and Finance (DCMF), Build-Operate-Own and Transfer (BOOT), Build-Transfer and Operate (BTO), etc. especially as they relate to green field type of investments. These and many more arrangements could be used to reduce deficiencies and ultimately enhance performance of the sectors. Chapter two addresses the various types of PPP Models and further looks at their implementation and performance.

While private financing is a major ingredient to improving public amenities, it is also a critical function in the measurement of PPPs performance and should be measured using various dimensions such as scope, cost, time and quality especially in the WSS sector. This would assist the government greatly in the monitoring and evaluation of various PPP projects undertaken in terms of the expected outputs, outcomes and impact on the users of services and the economy at large. For instance, the cost factor would allow the government to assess the cost involved in providing the service and related benefits arising from the investment. The cost baseline that is normally a time-phased budget can be used to measure and monitor cost performance. Though somehow difficult to measure the benefits from the social perspective point of view, there is reason to believe that the beneficiaries of the services provided are happy to a larger extent through their demonstrated actions. In essence, the benefits of engaging into a partnership should be more than or equal to the cost of providing a particular service without a partnership.

The aspect of Earned Value Management (EVM), a project performance measurement technique that integrates scope, time and cost data is a major ingredient to cost performance (Schwalbe, 2006). Given a cost performance baseline, and by entering actual information and then comparing it to the baseline, project managers and their teams can determine how well the project is meeting scope, time and cost goals (Schwalbe, 2006).

On the other hand, the time factor is measured in terms of delivering the goods and services by carrying out the planned activities within the scheduled time and duration of the project whereas the quality should be measured in terms of conformance to the set standards. Similarly, the quality of water distributed is critical in measuring reliability. All these factors should be done within the scope of the project (parameters of the agreed terms of reference or intentions) while taking into account the various risks that impact on them and likely to

hinder the contract or project performance. In other words, the needs and expectations of the target beneficiaries should be met to a larger extent. Factors of cost, time and quality have been dealt with adequately in Chapter two (literature review) in relation to how the use of existing PPP Models could increase their effectiveness and as core ingredients in this research.

Forthwith, Zambia has acknowledged the use of PPP projects as an alternative source of financing and as a means of enhancing social and economic development in its Sixth National Development Plan (SNDP) that runs from 2011 – 2015 and as a critical pedagogical dimension to reducing poverty (World Bank, 2011; MOFNP, 2008c). While Zambia was recently ranked as a lower - middle income country along with Ghana by the World Bank (World Bank, 2012; Lusaka times, 2011), poverty levels still remain very high (68%) (Index mundi, 2012) and problems of WSS still remain a major challenge. Most governments consider the provision of adequate supply of quality water and sanitation as a suitable strategic option in the reduction of poverty (Zambia Daily Mail Limited, 2012) and as bait to entice electorates for a vote. As such, most governments would ensure that adequate supply of quality water and sanitation is enhanced towards and during the run up to elections in order to woo more votes. A lot more projects are likely to be initiated to show government's commitment to providing the needed social services though they may not be done according to the expected magnitude due to hasty implementation. These may include among others rehabilitation and construction of infrastructure in key areas of the economy to ensure that service delivery is efficiently and effectively enhanced using limited resources. If the provision of public service delivery is well planned, a PPP could be used as a means of enhancing project financing thereby tapping the other benefits adduced to them in order to minimise the above challenges.

This chapter therefore outlines the background to the research in detail and links it to the evolution of the WSS in Zambia from both the policy and legal perspective point of view. It acknowledges the existence of the Public – Private Partnership Unit (PPP Unit), PPP Policy and Act in Zambia and further summarises certain key guidelines required in the PPP environment. The focus, aim and objectives of the research and the research process signifying the methodological approach to be undertaken and respective research outcomes are stated. The chapter ends by providing an overview of each chapter in the thesis.

1.1 Background to the Research

Zambia is a landlocked country and surrounded by eight (8) other countries (Figure 1.0 refers). It covers an area of 752,620 square kilometres with 11 provinces and 72 districts (Government of the Republic of Zambia, 2007, p. 1). It has a large water resource base with well distributed system of perennial lakes, swamps, rivers, and streams throughout its territory. In particular, there are 5 big lakes (Kariba, Bangweulu, Mweru, Mweru-wa-Ntipa and Tanganyika), four big river basins (Zambezi, Kafue, Luangwa and Luapula/Chambeshi) and favourable rain patterns. In all, the surface water resources are estimated to cover 45,000 square kilometres (6%) of the total land area and total ground water storage estimated at 1,740,380 cubic metres with ground water recharge of 160,080 cubic metres (Table 1.1 refers) (Mac Donald, 1990 cited in Government of the Republic of Zambia, 1994). Nonetheless, like many other developing countries, Zambia has had many challenges in the WSS sector and related infrastructure (MOFNP, 2008b; MOFNP, 2008c; Government of the Republic of Zambia, 1994 and 2010). This is despite Zambia's large water base and generating an estimated 100 Km³ per year of surface water and 49.6 Km³ per year of annual renewable groundwater potential respectively (DWA/JICA, 1995 cited in Government of the Republic of Zambia, 2010).

The statistics provided in Table 1.1 leaves many to wonder why adequate and quality water supply and sanitation is still farfetched in Zambia despite it being a basic human requirement or need. Factors such as poor water supply and provision of sanitation services, accessibility and service quality, reliability, lack of efficiency, financial sustainability and viability, environmental sustainability, affordability, insufficient asset base, and low shareholders value among others still remain problematic (NWASCO, 2010) not only in Zambia but in other developing countries (Fall et al., 2009; Locussol et al., 2009). Its continued efforts to develop the sector through the use of its own internally generated resources, budget and/or project support through grants and loans and subsequent partial realisation of these factors have not yielded the desired levels of social and economic benefits (World Bank, 2011). These in turn have contributed much to the present major barriers to social and economic development facing the urban, peri - urban and rural populations of Zambia thereby impeding on human development. When this is the case, a nation may be referred to as underdeveloped as the majority of its citizens are considered to be exposed to poor living

conditions and do not have capacities and choices for basic needs for livelihood survival, or experiencing absolute poverty induced by the nations' low production capacity, low economic growth rate, low income and capital accumulation, characterized by low expenditure on human development (Todaro & Smith, 2011). According to Todaro & Smith (2011), underdevelopment refers to an economic situation characterized by persistent low levels of living in conjunction with absolute poverty, low income per capita, low rates of economic growth, low consumption levels, poor health services, high death rates, high birth rates, dependence on foreign economies, and limited freedom to choose among activities that satisfy human wants. Human development is a process of enlarging people's choices by expanding human capabilities and functioning, allowing them "greater access to knowledge, better nutrition and health services", necessary to promote long and healthy lives, to be knowledgeable and have a decent standard of living (Qureshi, 2007). It is therefore a fact that inadequate provision of quality water supply and sanitation is likely to impede on human development and a recipe for unproductive society. This is also true in that the social and economic success is largely dependent on the provision of water and sanitation hence forth key to a health population, national productivity and wealth creation. This calls for a robust national strategy such as the use of PPPs arrangements, in this case, aimed at improving the provision of water and sanitation services through the use of corroborative efforts of both the public and private sectors.

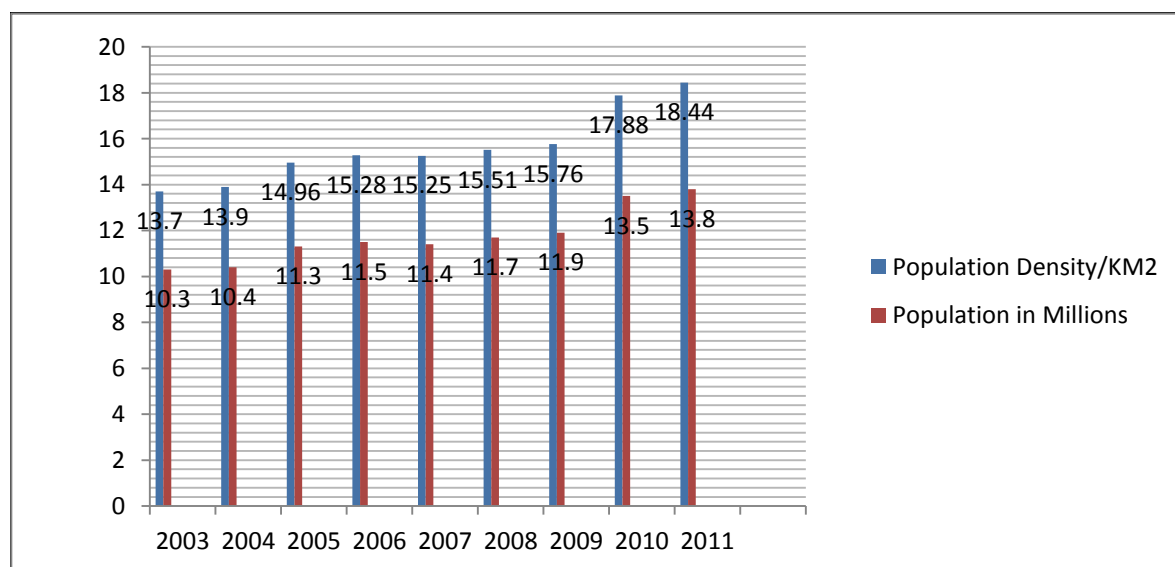
Table 1.1: Ground Water Potential in Zambia (All values in millions cubic metres)

	Drainage Basin	Luapula/ Chambeshi	Luangwa	Kafue	Zambezi	Total
1	Basin Area Km ²	194,500	147,500	155,000	256,000	752,000
2	Total Mean Annual Rainfall (mm)	214.1	122.3	149.72	228.69	714.85
3	Ground – water through flow	0.83	1.634	0.96	0.22	3.65
4	Vertical Recharge	41.5	33.02	24.45	64.03	160.08
5	Ground water storage	377.7	242.76	252.06	86.82	1,704.4

Data source: Government of the Republic of Zambia (National Water Policy), 1994, p. 12

According to the latest statistics released by the Central Statistical Office (CSO), Zambia’s population has increased from 10.3 million in 2003 to 13.8 million in 2011 with an average annual growth rate of 2.8 per cent (Index Mundi, 2012; Central Statistical Office - Zambia, 2013). The population is expected to increase further to 15.5 million by 2015 (World Bank, 2011). Similarly, the population density indicates an upward trend from 13.7 persons to 18.4 persons per square kilometre for the years from 2003 to 2011 respectively (Figures 1.1 below refers).

Figure 1.1: Zambia's Population Density Verses Population.



Source: Compiled by the Author using available data from the Central Statistics Office of Zambia.

The low GDP per capita, which stands around US\$ 1600 (2011), places the country among the world's poor nations. Social indicators continue to decline particularly in measurements of life expectancy at birth (about 50 years) and maternal and infant mortality rate (85 per 1000 live births) (UNDP, 2011). The high growth rate that average 2.8% per annum also makes it difficult for per capita income to increase. With the current GDP and the growth rate that is normally demand linear, the current water supply and sanitation services will become worse than before although the situation is still not acceptable by the majority population. These indicators continue posing additional challenges to the Zambian water and sanitation sector and calls for strategic options that would assist to remedy these challenges and assist in raising the living standards of the majority population. This therefore calls for additional investment in the water and sanitation sector using options that do not take away much of the countries budgetary allocation meant for other developmental issues thereby minimising the budget deficit.

Additional statistical figures in terms of accessibility to water and sanitation services indicate that in 2008 for instance, only 60% of the population of Zambia had access to an improved source of water supply and 49% had access to adequate sanitation. In 2010, urban and rural water supply stood at 78% and 46% respectively and urban and rural sanitation stood at 54% and 43% respectively. In urban areas, access to water connections stood at 41% whereas 49% rely on kiosks and standpipes. In relation to sanitation, urban population connected to sewers stood at 29% while 30% are served by septic tanks (NWASCO, 2010). In order to enhance economic growth and improve the quality of lives of most Zambians, it is estimated that by 2015, accessibility to reliable safe water and adequate sanitation will stand at 75% and 60% respectively (MOFNP, 2008c). This in itself is a confirmation that access to improved sources of water supply and sanitation still remain a challenge despite having adequate water resources. It also authenticates the need for a strategic option that would assist in remedying this challenge and hopefully the PPP option that would increase effectiveness in the provision of water and sanitation services.

Though accessibility to adequate safe drinking water and sanitation has been a topical issue and a top government's agenda, its efforts has been hampered by increased urbanisation (increase in population in cities and towns versus rural areas) to a larger extent. According to Wikipedia (2012), Zambia is considered as one of the Sub-Saharan Africa's most highly

urbanised countries. Based on the 2010 total population, it was estimated that urban population stood at 36 per cent and using 3.2 per cent as the estimated rate of urbanisation, it could be asserted that urban population by the end of 2012 stood at 38 per cent (Index Mundi, 2013). Similarly, the Zambia Index (2013) reports that on a comparative basis using the 2000 and 2010 National Census of Population and Housing, and the population arising therefrom, the population in rural areas increased by 22.6 per cent [6,459,393 (2000) to 7,919,216 (2010)] and that of urban areas increased by 51.0 per cent [3,426,862 (2000) to 5,173,450 (2010)] confirming the higher rate of urbanisation. Almost all provincial headquarters have expanded tremendously due to urbanisation thereby increasing the demand and pressure on the few existing facilities and infrastructure. The swelling demand is exacerbated by the fact that most WSS infrastructure were built a long time ago, thus dilapidated. This increases the Non-Revenue Water (NRW) component of most water utility companies thereby reducing the revenue (turnover) component.

At a Copperbelt Water Operators Partnership Seminar in Kitwe, the Local Government and Housing Deputy Minister disclosed that water utilities in Zambia lose over ZMW 375.5 million annually in unaccounted for water and that this needed to be seriously addressed because it affects the effective delivery of water and sanitation to the people especially the low-income communities (Wangwe, 2013). The country's capital supplement to the sector has also been negligible in comparison to the needed capitalisation thus having very little impact on the ground. For instance, Chambeshi Water and Sewerage Company (ChWSC) would need at least US\$16 million for infrastructure development (dilapidated) for improved water delivery in the 11 Districts in which they operate (Kuwema, 2012).

While the government has made tremendous strides to reform the WSS sector overtime, more especially by allowing City, Municipal and District councils to formulate commercial water utility companies in strategic locations across all provincial centres (NWASCO, 2010), this has not yielded much to the majority Zambian population. Most infrastructures in the Commercial Utilities (CUs) currently providing water and sanitation services are dilapidated and cannot therefore facilitate the provision of adequate water and sanitation services (amplified in paragraph 1.2 below) and need a major face lift. This inhibits the reticulation, production, storage and supply of the commodity to the public thereby affecting both the capitalisation and revenue generation capacities of most CUs. It also entails that the CUs

cannot invest sufficiently into the infrastructure to allow an efficient process of water generation and as such insufficient rate of returns on the investment. Similarly, CUs cannot expand their service provision to new industrial and residential areas due to their limited capacity. The major implication is that Zambia's large population end up being susceptible to some water borne diseases such as diarrhoea, typhoid and related pandemics arising from poor water and sanitation services. This has the potential to hinder human development.

As a way forward, the government has been incorporating these challenges in its various Strategic Plans, notably the Sixth National Development Plan (SNDP) that has superseded the Fifth National Development Plan (FNDP) (MOFNP, 2008c), the Millennium Development Goals (MDG) whose final performance measurement is slated for 2015 and ultimately the Zambia's Vision 2030 (MOFNP, 2008d). The 2030 vision has been set as a benchmark for Zambia becoming a prosperous middle income country. Recently, the Minister of Finance launched a Strategic Plan covering the period 2012 – 2016 outlining a number of strategic intentions to be implemented (MOFNP, 2008a). The plan indicates that Investment in water and sanitation infrastructure should be given priority in national development programmes because these two aspects of life are at the centre of development and human existence (Wangwe, 2013). Nonetheless, this calls for additional capital to supplement the meagre domestic revenue currently being generated. Statistically, Zambia's domestic revenue of Gross Domestic Product (GDP) for the period 2006 – 2010 stood at 17.5% on average (World Bank, 2011). According to Wikipedia (2012), investment and financing needs for water and sanitation in 2002 were estimated at US\$ 33.5 million out of which US\$ 33.0 million (98 per cent) were from donors and Non-Governmental Organisations (NGOs) an indication that the sector investments are predominantly financed by donors and NGOs. While budget release by government has improved slightly from 2 per cent in 2002 to an average of about 6 per cent in 2009 based on the budget performance for water and sanitation for the years 2006 -2008, the trend is still not encouraging as more than 90 per cent of the sector expenditures still come through foreign financing in form of budget support (UNDP, 2011). Table 1.2 below refers. This entails that most WSS programmes cannot be implemented as planned due to the low trend of investments in the sector. A recent study on sector capacity observed serious gaps in staff numbers, qualifications and skills at the District level and in CUs making it even more difficult to implement the sector

programmes (Ministry of Local Government and Housing, 2007 cited in UNDP, 2011). This has impacted the sector in terms of cost, time and quality effectiveness and ultimately poor service delivery.

Table 1.2: Budget performance for water and sanitation (ZK billion) 2006 – 2008.

Total for water and sanitation	2006	2007	2008	2009
Fifth National Development Plan	256.50	268.00	232.50	757.00
Budgeted	167.31	317.92	370.01	855.25
Released	7.51	24.96	23.89	56.32
Percentage (%) release of Budget	4.49	7.85	6.46	6.58

Source: UNDP Zambia Human Development Report 2011 as cited from Ministry of Education 2002 – 2008, p. 80

As part of the strategy, and in order to augment financing to the water and sanitation sector, government has established a Devolution Trust Fund (DTF) supported by the Federal Republic of Germany. The Fund is aimed at increasing access to clean water through water kiosks in poor urban areas through the use of low-cost technologies. A large array of external public donor support in the water and sanitation sector continues being a reality. In the recent past, the German Government released ZMW550 billion to the Zambian government to be used in enhancing the fight against poverty and programmes to strengthen good governance (Zambia Daily Mail Limited, 2012). A portion of ZMW216 billion will be used for water and sanitation in a bid to reduce water borne diseases. During the Copperbelt Water Operators Partnership Project Seminar in Kitwe, it was disclosed that 1.3 million euros has been invested in the project (Wangwe, 2013). Further details on financing and as provided by Wikipedia (2012) indicate that the African Development Bank (ADB) has been supporting seven local authorities in institutional reforms and infrastructure rehabilitation in Central Province under a project approved in 2003; a National Rural Water Supply and Sanitation Programme (NRWSSP) approved in 2006 and Water Supply and Sanitation (WSS) under a project approved in 2008 for Nkana Water Supply and Sewerage Company (NWSC) in the Copperbelt province. Others include Denmark through DANIDA supporting

Mulonga, Kafubu and Western Water and Sewerage companies since 2004 and approved a EUR 32.8 million five-year (2006 – 2010) Water Support Program for WSS in rural areas as well as Integrated Water Resources Management (IWRM); Ireland in support of the Chambeshi commercial utility; Japan through JICA providing investments in ground water development in Luapula province (2008-2010), technical cooperation for the sustainable operation and maintenance of rural water supply (2007 – 2010) and capacity building for commercial utilities (2007 – 2009) and the World Bank through a US\$ 23 million Water Sector Performance Improvement Project (WSPIP) approved in 2006 (Wikipedia, 2012).

Despite this effort made by Government and Donors at large, improved WSS still remain a pipe dream to the majority population culminating in high poverty levels. The demand for additional capital injection continues haunting the Zambian Government. ONG (2003) suggests that a possible way forward in situations of this nature is to positively promote development of new relationships between the Government, the private sector, mainstream financial institutions and the local community. This would help bring about greater efficiencies in reducing the cost associated with providing this service and ultimately give greater value to those desiring better WSS. The researcher believes that by employing a PPP strategy, in a bid to improve on cost, time and quality effectiveness, these challenges would possibly be minimised considering the benefits that come with this type of arrangement.

1.2 Evolution of the Water Supply and Sanitation Sector – Policies, Institution, and Legal Framework.

The water sector has evolved as far back as the 1940s and largely operated under the Water Act of 1949, Chapter 198 of the Laws of Zambia. Generally, the Act had put more emphasis on Water Resources Management (WRM) as opposed to WSS. Due to many institutions that were involved in the WRM, government was faced with a number of cross – cutting problems in the sector pertaining to institutional coordination and programme implementation. As a short term measure, a task force on Social Rehabilitation and Maintenance (SRM) was formed to address the WSS activities (Government of the Republic of Zambia, 1994). From a long-term perspective, the Programme Coordinating Unit (PCU) was established and given the mandate to spearhead the reorganisation of the WSS sector in line with the adopted seven (7) Water Supply and Sanitation Sector (WSSS) principles

(Government of the Republic of Zambia, 1994) (Table 1.3 refers). The Water Resources Development and Management (WRDM) largely operated under the Ministry of Energy and Water Development (MEWD), in particular the Department of Water Affairs (DWA) whereas the WSS sub-sectors initially operated under the Local Authorities (LAs) but then bestowed on the MEWD before reverting back to LAs under the Ministry of Local Government and Housing (MLGH). Table 1.3 refers.

Table 1.3: Seven sector Principles from the National Water Policy 1994 and 2010 as adopted by Government

<p>The mandate given to the PCU included undertaking:</p> <p>Sector policy reforms; clarification of sector responsibilities; sector organisational reforms;</p> <p>framework for planning, project development and operation and maintenance; and proposal for institutional strengthening. The PCU mandate was guided by the seven WSS sector principles adopted by Government and included the following:</p>
<p>Principle 1: Separation of water resources functions from water supply and sanitation.</p>
<p>Principle 2: Separation of the regulatory functions and executive functions within the water supply and sanitation sector.</p>
<p>Principle 3: Devolution of authority to local authorities and private sector.</p>
<p>Principle 4: Achievement of full cost recovery for the water supply and sanitation services through user charges in the long run.</p>
<p>Principle 5: Human resource development leading to more effective institutions.</p>
<p>Principle 6: Technology appropriate to local conditions, and</p>
<p>Principle 7: Increased GRZ spending priority and budget spending to the sector.</p>

Source: National Water Policy 1994, p. 28 and 2010, p.15

In an effort to try and respond to the deteriorating service delivery, the sector principle No. 3 was implemented as a strategy aimed at bringing about efficiency and effectiveness in the management of service provision. The Government decided to commercialise (as opposed to privatisation) the provision of water and sanitation services by bringing in private sector principles in the management of public institutions and as a means of securing private sector efficiencies with Government oversight. The concepts of commercialisation and privatisation

have been dealt with in Paragraph 2.2 of the literature review as they relate to the PPP concept. The main goal of commercialising the water and sanitation service provision was to improve service delivery by way of creating viable limited liability utility companies managed by professionals in order to attract external investment (Wikipedia, 2012). The 72 local authorities have therefore vested their responsibility of WSS service delivery in urban areas to privately run CUs formed as joint ventures among local authorities. Local authorities as shareholders appoint Board of Directors to oversee the WSS providers established.

This means that all CUs operate under the sole shareholding of the respective City, Municipal and District councils that own the commercial water utility companies across the country. The day-to-day running of the utilities is the responsibility of the appointed management. Going by the above statistics, this strategy seems to be working to a certain extent for CUs as compared to when the services were directly provided by the Councils. Nonetheless, they still face a number of challenges mainly in terms of dilapidated infrastructure and insufficient financing. There is still a long way to go as observed from the population in each of the CUs and extent of coverage in terms of water and sanitation (Table 1.4 refers).

Table 1.4: Water Supply and Sanitation for each CU by population and coverage.

CU	Province	Population in Area 2009/10	Water Supply Coverage 2009/10	Sanitation Coverage 2009/10
Lusaka WSS	Lusaka	1,831,408	70%	19%
Nkana WSS	Copperbelt	685,420	88%	52%
Kafubu WSS	Copperbelt	633,656	86%	59%
Mulonga WSS	Copperbelt	436,249	89%	71%
Lukanga WSS	Central	365,869	66%	27%
Southern WSS	Southern	328,882	89%	58%
Chambeshi WSS	Northern	275,474	63%	32%
North-Western WSS	North Western	223,817	69%	22%
Western WSS	Western	176,477	58%	16%
Eastern WSS	Eastern	217,632	58%	22%
Luapula WSS	Luapula	173,206	19%	0%

Source: UNDP Zambia Human Development Report 2011 as cited from Zambia National Water Supply and Sanitation Council 2010

Based on the above statistics in Table 1.4, it is evident that water and sanitation coverage is still farfetched especially for Luapula whose water and sanitation coverage is 19 percent and 0 percent respectively. The majority of the population still remain without sufficient sanitation especially those relating to Lusaka, Central, Northern, North Western, and Western and Eastern provinces respectively whose sanitation coverage are below 50 percent.

Arising from the historical geography of water and human settlement in the Southern African Development Corporation (SADC) as captured by McDonald & Ruiters (2005) and as they relate to safe water and sanitation, it is apparent that Malawi, Mozambique, Swaziland and Zambia have the highest proportions of at least 50 percent unserved population without access to safe water while Lesotho, Malawi and Mozambique have the highest proportions without access to safe sanitation. South Africa and Tanzania stand out with the lowest proportions of unsafe sanitation despite having the highest population. In other words, lack of both unsafe water and sanitation is a common phenomenon across SADC countries with Malawi topping the list (Table 1.5 refers).

Table 1.5: SADC states access to clean water and sanitation

Country	Total Population (millions)		Population Growth rate (%)		% population without access to safe water & sanitation	
	1999	2015	1975-1999	1990-2015	Safe water 1990-1998	Sanitation 1990-1998
Angola	12.8	20.8	3.0	3.1	32.0	-
Botswana	1.5	1.7	2.9	0.7	10.0	45.0
Lesotho	2.0	2.1	2.1	0.4	38.0	62.0
Malawi	11.0	15.7	3.1	2.2	53.0	97.0
Mozambique	17.9	23.5	2.3	1.7	54.0	66.0
Namibia	1.7	2.3	2.7	1.8	17.0	38.0
South Africa	42.8	44.6	2.1	0.3	13.0	13.0
Swaziland	0.9	1.0	2.9	0.7	50.0	41.0
Tanzania	34.3	49.3	3.1	2.3	34.0	14.0
Zambia	10.2	14.8	3.0	2.3	62.0	29.0
Zimbabwe	12.4	16.4	3.0	1.7	21.0	48.0
DRC	49.6	84.0	3.2	3.3	32.0	-

(-)= Not available

Source: UNDP (2000, pp. 170-71; 2001, pp155 - 156)

It is also reported that over 1 billion people worldwide lack access to potable water and 2 billion without access to sanitation and millions of deaths a year from easily preventable diarrhoea – related illnesses (McDonald & Ruiters, 2005) and generally some 8.37 per 1000 per year die from various deaths including water related. This is a confirmation that there is need to uplift the living standards for most populations in both water and sanitation globally.

The evolution of the WSS sub - sector in terms of policy, institutional and legal framework clearly showing the historical chronology of events is shown in Table 1.6 whereas institutions involved in the WSS sub-sector are shown in Figure 1.2 below.

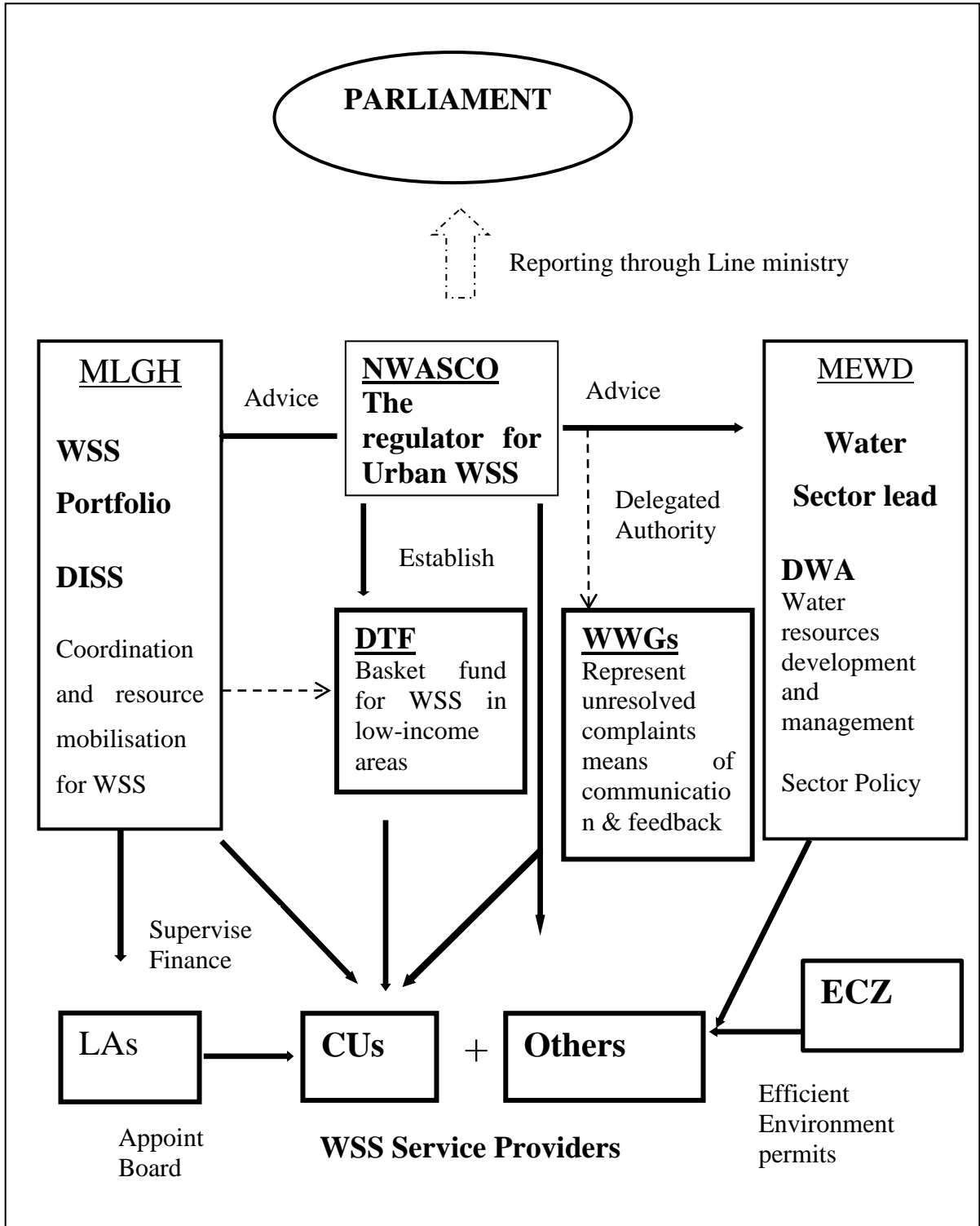
Table 1.6: Chronology of the evolution of the water supply and sanitation sector in Zambia.

Year	Event
1976	The DWA proposed a “Zambian National Water Authority” to be responsible for both WSS as well as WRM.
1984	Attempts to recognise the WSS failed despite recommendations from the National Conference on “Zambian Plan of Action for WSS” held by the International Drinking Water Supply and Sanitation Decade (IDWSSD) Secretariat.
1985	Zambia Industrial Mining Corporation (ZIMCO) issued a report called: “Proposed National Water Authority”, again proposing the establishment of one authority to manage both the WSS and WRM.
1986	Cabinet Office instructed by Government to hold a high level meeting to discuss the establishment of the proposed authority and to include the set-up of a regulator for WSS and a National Water and Sewerage Company.
1991	With a change in Government that introduced general public service reforms and the liberalisation of the economy thus creating a conducive environment for water sector reforms. A workshop on the water sector policy was also held
1993	Government launched a comprehensive water sector reforms and established the Programme Coordinating Unit (PCU) tasked with the responsibility of steer the implementation of the sector reforms.
1994	MEWD through the National Water Policy Development Initiative developed the National Water Policy as a framework for future development of the water sector. This included the Seven Sector Principles (See Table 1.3 above) adopted by government.
1994	Cabinet decision to set up a regulator NWASCO to be responsible to the MEWD and in line with the Seven Sector Principles, an institutional set – up be done for the water sector (See Figure 1.2 below)
1997	New Water Supply and Sanitation Act No.28 passed superseding the 1949 Water Act.
2010	MEWD developed the National Water Policy to embrace modern principles of water resources management and endeavours to deal with the daunting challenges of poverty reduction.

Source: NWASCO Report – 2010.

These provide a strategic road map to reforming the water and sanitation sector and an environment within which water and sanitation would be better provided. Similarly, the authority to license the CUs to operate and provide water and sanitation services are vested in the National Water Supply and Sanitation Council (NWASCO) called the regulator and reports to the MEWD. This also means that any arrangement to be introduced outside the already established regulations, such as a PPP arrangement, would need to be incorporated in the PPP policy and Act that is already in place.

Figure 1.2: Institutions in the WSS sub-sector (NWASCO 10 years of regulation)



Source: NWASCO Report - 2010

1.3 The Public – Private Partnership Act and Policy in Zambia

While other forms of financing such as budget and project support (internally generated grants and loans) have been used, Government has acknowledged that the use of PPP tools and techniques to finance infrastructure development could enhance public service delivery. Forthwith, the PPP Unit was formed as a directorate under the MOFNP and PPP policy developed to provide guidance on PPPs. The Government’s vision on PPPs is:

“To have well developed and maintained quality and socio - economic infrastructure and related services that enhances the Zambian people’s livelihood and effectively contributes to national development through PPP frameworks and initiatives” PPP Policy and Act (2009, p. 5).

The Act was developed and enacted into law in order to put into effect the need to use PPPs as strategic tools and means of complimenting Government efforts to mitigate the limited resources towards economic programmes (Government of the Republic of Zambia, 2009). This strategic direction allows the infusion of the private sector in the provision and delivery of public service, whereby the private sector is allowed to inject additional capital to improve the provision and delivery of public service. The private sector would in turn benefit depending on the type of arrangement entered into. PPPs have been considered as a viable means that can address the constraints of finance and management faced by the public sector. By so doing, infrastructure development and delivery of social services in Zambia could be necessitated and enhanced in various sectors of the economy. In particular, the adequacy and quality of WSS could be enhanced and in turn assist in the reduction of poverty. The PPP policy is therefore a strategic document that clearly outlines the country’s strategic objectives in terms of PPPs and includes among others the implementation framework (Government of the Republic of Zambia, 2009). The policy is backed by the PPP Act No. 14 of 2009 and both the PPP Policy and Act provide an enabling environment for various PPPs to be initiated, developed and implemented using a number of variants such as Concessions, Lease, Management, Service contracts among others.

The Act (PPP Act of 2009, page 79) provides for the participation of the private sector in the provision of social sector services and the development and operations of public infrastructure as indicated in the except below.

“An Act to promote and facilitate the implementation of privately financed infrastructure projects and effective delivery of social services by enhancing transparency, fairness and long term sustainability and removing undesirable restrictions on private sector participation in the provision of social sector services and the development and operation of public infrastructure; establish a Public-Private Partnership Unit and provide for its functions; establish the public-private partnership Council and provide for its function; provide for public-private partnership for the construction and operation of new infrastructure facilities and systems and the maintenance, rehabilitation, modernisation, expansion and operations of existing infrastructure facilities and systems and the provision of social sector services; develop general principles of transparency, economy and fairness in the award of contracts by public authorities through the establishment of specific procedures for the award of infrastructure projects and facilities and provision of social sector services and rules governing public-private inception, procurement, contracting and management of public-private partnerships; provide for the implementation of public-private partnership agreements between contracting authorities and concessionaires; and provide for matters connected with, or incidental to, the foregoing”. Source: PPP Policy and Act of 2009, p. 79.

As a way of address the poverty levels arising from poor WSS, PPPs could thrive on the available enabling policies, institutional and legal frameworks in Government. In other words, there is need to design and implement reforms of WSS sector by improving WSS service provision through partnerships with the private sector (Locussol et al., 2009). Others may include involving stakeholders in WSS reforms; revisiting WSS policies; changing the culture of public WSS services providers; optimising WSS asset management and infrastructure development; financing WSS operations in a sustainable and affordable manner; and regulating the WSS service in a transparent and predictable manner (Locussol et al. (2009). Chapter two (literature review) addresses in detail how PPPs have been used in the delivery of public services in both developed and developing countries like Zambia and their efficiency and effectiveness in terms of public service delivery.

1.4 Research Focus

The background to the research (above) outlines a number of factors among others that have rendered public service delivery ineffective and inefficient especially as they relate to the WSS. It also alludes to an enabling environment that would enable the PPPs to be used as a source of capital additionally and a means to making public service delivery efficient and effective. While huge capital investment beyond budget and project support is required, experiences in other developing and developed countries have shown that the use of PPPs could remedy the situation (Fall et al., 2009; ADB, 2008; Hay, 2009, p, 1; Al-Shqairal, 2009; Ghobadian et al., 2004; Li 2003, p, 45; ONG, 2003). Although some PPPs have been applied in some sectors in Zambia such as transport, construction, agriculture, mining and energy, there seem to be none of similar magnitude in the water and sanitation sector. However, the application of PPP Models in the construction sector is an indication that PPPs have been embraced in Zambia as a way of enhancing public service delivery.

The researcher intends to address the PPP concept as seen from the geographical point of view and as applied in other sectors and review the existing PPP Models implementation as a starting point taking into account factors used in ensuring their success (Hay, 2009; Fall et al., 2009; Jacobson and Choi, 2008, Trafford and Proctor, 2006; ONG, 2003; Ahadzi, 2004), conduct an investigation and ultimately develop a Conceptual Model based on existing PPP Models and dimensions of cost, time and quality in the sector in question. The research therefore focuses on how the use of existing PPP Models could increase effectiveness in the development of the Zambian water and sanitation sector using factors of cost, time and quality. The researcher uses the PPP financing strategy to investigate into the use of existing PPP Models in the Zambian water and sanitation sector not as a way of contrasting it with other forms of raising finances but to determine as to whether they can effectively assist in enhancing the sector performance using cost, time and quality dimensions.

1.5 Research Aim and Objectives

In order to address the Zambian Water and Sanitation sector challenges, a much more lasting solution needs to be found by putting in place effective mechanisms aimed at improving the sector. One such mechanism is the initiation of formal PPP Models in the sector taking into account the available current institutional, policy and legal frameworks on both PPPs and

water and sanitation sector in Zambia and views of stakeholders in the sector although the main focus is on how existing PPP Models could increase effectiveness. Lack of water and better sanitation is considered to be a recipe for social problem and ultimately a poverty and political issue. Government has acknowledged the need to reduce poverty levels in Zambia through various interventions as enshrined in the SNDP and the Millennium Development Goals (MDGs) (World Bank, 2011; MOFNP, 2008c). Water and sanitation is therefore a prominent phenomenon in these documents and the focus is on providing water and sanitation infrastructure and development of skills to ensure effective water resource management and the effective provision of reliable and safe water and sanitation services (MOFNP, 2008c). A number of interventions need to be put in place to address these challenges. One such intervention is the use of the PPP concept strategy as a means of enhancing the sector performance.

While the research by The Chartered Accountants Educational Trust (CAET) acknowledges that PPPs in the public sector are driven by lack of finance, need for modern technology and/or effective and efficient management skills and risk transfer, and that the needs may differ from project to project, it concludes that capital additionality is the main driver of PPPs in the public sector (ACCA, 2012). This appears to be a fair summary and conclusion of the many reasons that have been advanced by many researchers though most developed countries have cited value for money and risk transfer as the drivers of PPPs (Refer to literature review). However, what has been lacking in most research on PPPs is lack of conclusive evidence on their performance especially as they relate to factors of cost, quality and time effectiveness. For instance, Ahadzi (2004) addresses the aspects of pre – contract time and bidding cost overruns from the context of proactively managing the PPP contract negotiation process mainly from the efficiency point of view and not from the effectiveness point of view. The report does not also look at performance of PPPs from the full implementation point of view in determining efficiency levels. Similarly, numerous researches have been done on PPPs based on value for money though not necessarily effectiveness. Nonetheless, much of the focus has been particularly on aspects of risk transfer and management.

The research therefore aims to investigate into the use of existing PPP Models for increased effectiveness and ultimately to develop a PPP Conceptual Model that will conceptualise the PPPs effectiveness in the development of the Zambian Water and Sanitation sector. In

developing the PPP Conceptual Model, results from sector respondents and as analysed using both descriptive statistics and content analysis have been used. In doing so, factors of cost, quality and time are used in the assessment and subsequent development of the model and as they relate to existing PPP Models overall effectiveness.

The objectives of the research are therefore:

1. To identify and conceptualise existing Public - Private Partnerships (PPPs) Models commonly used in PPPs arrangements.
2. To critically evaluate if existing models of PPP can be used to increase cost, time and quality effectiveness in the case of the development of the Zambian Water and Sanitation sector.
3. On the basis of objective 1 and 2 above, suggest an implementable Model of PPP for the Zambian Water and Sanitation sector.

In line with the research process, the above set objectives will be used to achieve the expected outputs in the research process as reflected in paragraph 1.6 below.

1.6 The Research Approach

The research process provides a systematic four staged approach to the research (Figure 1.3 refers).

Stage one will enable the researcher to carry out consultations with various stakeholder with direct and indirect interest in the sector in question. This sets the pace in terms of interest generated from various stakeholders and subsequent literature review. It allows a detailed literature review cutting across the concept of PPPs, identifying and reviewing existing PPP Models in the water and other sectors, determining their structural setup, implementation and performance and their applicability. The literature review together with the questionnaire research (stage two) allows the development of the Alpha Model.

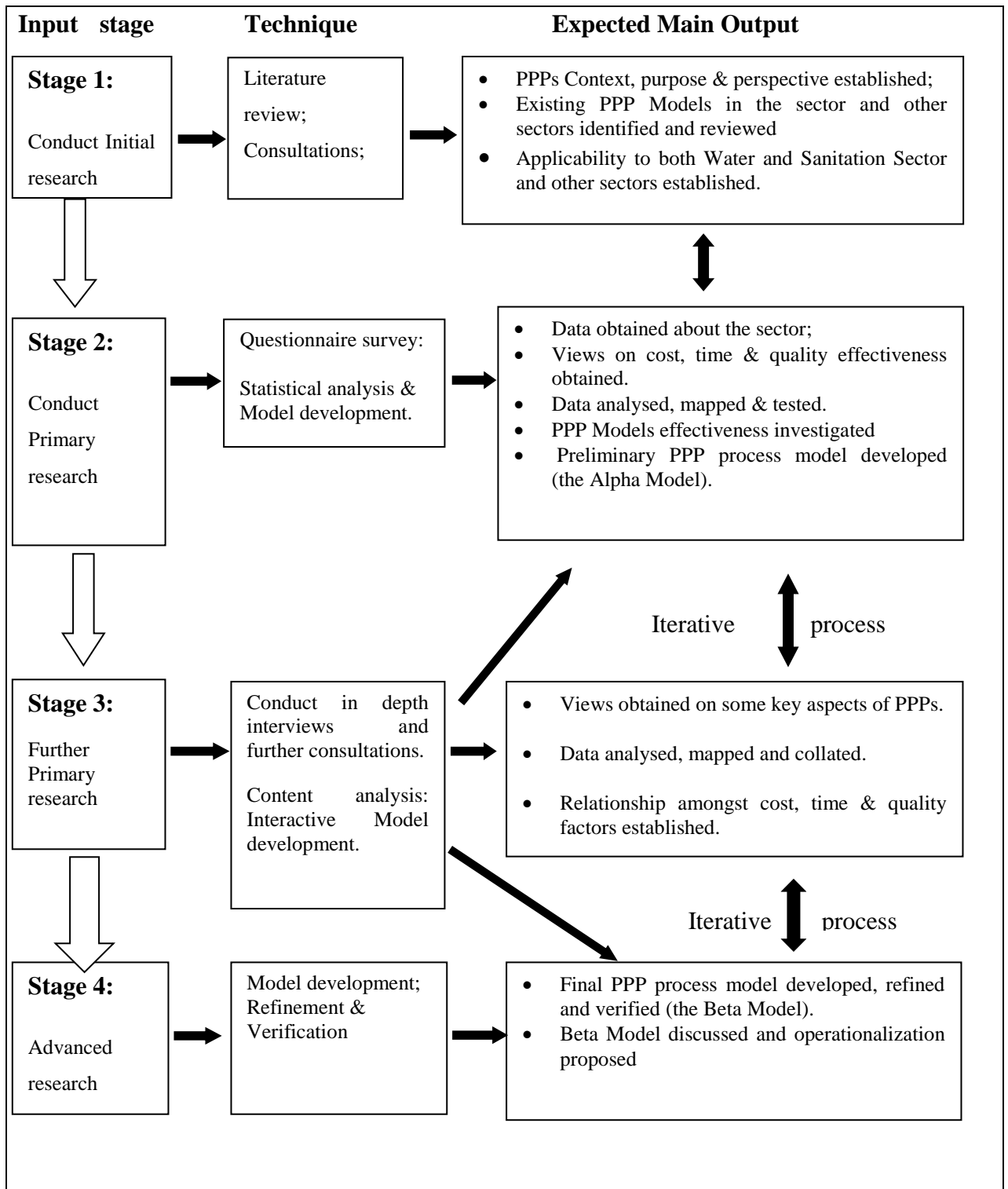
Stage two uses a questionnaire research as an additional data gathering instrument in order to allow the analysis of data statistically using a statistical package, mapping and testing. This allows further investigation of PPP Models effectiveness and establishing the relationships amongst the factors of cost, time and quality. As indicated in stage one, the Alpha Model is

developed using data from both literature review and questionnaire research. The iterative process is allowed amongst stages 2, 3 and 4 in order to assist the verification of the expected main outputs.

Stage three uses in - depth interviews and further consultations as primary data gathering instruments in order to obtain data about the sector in question from experts. Using the content data analysis tools, the data gathered is analysed and mapped in order to further investigate the current PPP Models effectiveness and ultimately assist in the refinement of the Alpha Model.

Stage four allows the final model development (the Beta Model) that is refined and verified. The Beta Model and its proposed operationalization are discussed. It is expected that the model will enhance the understanding of the existing PPPs Model effectiveness in the Zambian Water and Sanitation Sector considering the tangible benefits that are likely to be provided in as far as the provision of water and sanitation services is concerned.

Figure 1.3: The Proposed Research Methodology



1.7 Intended Contribution

The study is the first of its kind and is intended to provide a greater understanding of how existing PPP Models could be used to increase effectiveness through dimensions of cost, time and quality thereby providing tangible benefits in as far as the provision of water and sanitation services in Zambia is concerned.

1.8 Thesis Chapters Outline

Chapter One

This chapter provides a synopsis of the purpose of the research. It provides a background to the challenges in the Water and Sanitation Sector both from the policy, institutional and legal framework point of view and sector infrastructure development in terms of capital additionality and enhancement of sector performance. It outlines the evolution of the Water and Sanitation Sector in order to signify the need to develop the sector and improve on the social, economic and political dimensions of the country. This is amplified by the research focus on how existing PPP Models can be used to increase effectiveness in the development of the Zambian Water and Sanitation Sector using factors of cost, time and quality. It is acknowledged that having clear performance measurement of PPPs would assist many PPPs implementers to be more focused in terms of expected results. The PPP financing strategy has therefore been used to determine as to whether PPPs could effectively assist in enhancing the sector performance and not as a way of contrasting it with other forms of raising finances. A flow chart of the methodology to be employed in the research is provided.

Chapter Two

The chapter deals with the literature review looking at the concepts of PPP and the various PPP Models. It further establishes the PPPs context, purpose & perspective by looking at how PPPs are perceived and the need to do them. It brings out and contextualises the existing PPP Models in the sector in question and other sectors. It also looks at PPP applicability to both Water and Sanitation Sector and other sectors. The research aim, objectives, and hypotheses are developed in order to assist in the design of the research and subsequent development of the methodology and methods to be employed in the gathering and analysis of the data and the determination of preliminary results.

Chapter Three

This chapter outlines the research design by clearly stating the methodology and methods used to gather and analyse data. The research design justifies the methodology and methods employed in the research to facilitate the analysis of the data and determine the results there from. The techniques used allow the achievement of the aim and objectives of the research. The quantitative research (using questionnaire survey) is used to a larger extent whose data analysis and results generated there from together with the literature review are used to develop the Alpha Model. Subsequent in - depth interviews are used to get expertise input from the experts in the sector and data analysis and results there from used to refine and verify the Alpha Model in order to develop the Beta Model.

Chapter Four

The chapter deals with two parts on data analysis and presentation of results: Part one is about results, analysis and discussion of data from a preliminary research using the questionnaire survey to gather data from respondents. Based on the results therefrom and information arising from the literature review, an Alpha Model is developed to inform and facilitate the development of the Beta Model. Part two is about results, analysis and discussion of data from in - depth interviews conducted from experts in the sector in order to refine the Alpha Model developed in Part 1 to facilitate the development and verification of the Beta Model in Chapter Five.

Chapter Five

This chapter develops and discusses the Conceptual Beta Model and its operationalization using the results from the interview survey.

Chapter Six:

This chapter provides a summary, conclusion and recommendations for future research.

CHAPTER TWO

2.0 Literature Review

2.1 Introduction

This chapter on literature review aims to investigate the PPP concept in a diverse way in order to evoke a wider understanding of the concept. It provides a general understanding of the concept, its importance and how it has developed globally. The PPPs concept is contextualised in order to establish their context, purpose and perspective and how they are perceived by various parties involved and the need to do them. Similarly, various PPP Models/Schemes that are used in both developed and developing countries are alluded to and contextualised. Reasons and arguments that motivate parties to go into PPPs arrangements are put forward in order to signify their importance and establish a common ground behind PPPs undertakings. The chapter further reviews and evaluates the existing PPP Models, their implementation and performance and applicability to the WSS and other sectors in other countries including Zambia. Through this process, the researcher believes a suitable PPP Model can be developed to fit in the Zambian Water and Sanitation Sector based on cost, time and quality factors. The research aim, objectives, and hypotheses are developed to assist in the design of the research and subsequent development of the methodology and methods to be employed in the gathering and analysis of the data and ultimately the determination of both the Alpha and Beta Models and subsequent conclusion and recommendations.

The literature review chapter therefore addresses the first objective of the research, i.e. *“To identify and conceptualise existing models of Public Private Partnerships (PPPs) commonly used in PPPs arrangements”*. and is therefore based on the following key areas:

- The Public Private Partnership (PPP) concept.
- PPP Models/Schemes, their implementation and performance.
- Application of existing PPP Models to Water and Sanitation Sector in some selected developed and developing countries including Zambia.

In addition, the Literature review also provides the necessary conceptual underpinning to the thesis.

2.2 Public – Private Partnerships (PPPs) Concept

Given the changing economic, social and political environment, coupled with globalisation and budget constraints, PPPs have become unavoidable and indeed desirable in many countries world-wide (School of Built and Natural Environment, 2011). The PPPs concept has been dissected and debated from different angles by various scholars (ACCA, 2012; Mouraviev & Kakabadse, 2012; Ball, 2011; Fall et al., 2009, p. 7; Nisar, 2007; Ghobadian et al., 2004; Li, 2003; ONG, 2003) and a number of developed and/or developing countries worldwide have used or planned to use this concept in a way they see it beneficial. Their quest to enhance public service delivery especially when it comes to factors that enhance Value for Money (VFM) and risk sharing and/or transfer makes the PPP concept a preferred option. It is reported that a PPP is a relatively new and developing concept (Sciulli, 2008; Ghobadian et al., 2004). Nonetheless, PPPs have existed for many decades in both developed and developing countries such as Europe and the United States of America (USA) (ACCA, 2012; Ghobadian et al., 2004, p. 1; Li, 2003), Western and Central Africa (Fall et al., 2009, p. 7, Li, 2003), and Asian countries (ACCA, 2012; Li, 2003). In particular, PPPs including Public Finance Initiatives (PFIs) (though at times used interchangeably) with European, Western and Central African countries date as far back as the nineteenth century (Fall et al., 2009; Ghobadian et al., 2004) an indication that PPPs are a common phenomenon worldwide. It is also reported that in many developed and developing countries there has been a move towards increased reliance on PPPs for infrastructure development in a bid to overcome broad public sector constraints in relation to either a lack of public capital and/or a lack of public sector capacity, resources and specialised expertise to develop, manage and operate infrastructure assets (School of Built and Natural Environment, 2011). The report further indicates that PPPs are now commonly used to accelerate economic growth, development and infrastructure delivery and to achieve quality service delivery and good governance and that the spectrum of nature and types of PPPs are overwhelming, making a definition of a PPP difficult. Despite the difficulties in defining a PPP, an attempt has been made to conceptualise PPPs in a wide variety of ways.

In a conceptual paper by Mouraviev & Kakabadse (2012), an attempt was made to survey various meanings attached to a PPP and related aspects in Western literature, and identify commonalities and differences between them. In doing so, views on PPP meanings, forms and models within Western PPP literature were contrasted and compared with the understanding of partnership aspects in the Russian language sources. Theories underpinning PPPs were examined and connections to PPP advantages and drawbacks were built and critical assessment of net benefits that PPPs may bring along to the society provided. Mouraviev & Kakabadse (2012) found that future PPP research in transitional countries such as Russia, particularly in the areas of organisational and power arrangements in partnerships, may delineate new concepts such as Government as a guarantor of a PPP project, social significance of a PPP project, and risk management in a country's contextual environment. Based on Mouraviev & Kakabadse (2012) findings, and for the purpose of this study, conceptualising the PPP could provide sufficient latitude in terms of understanding the context, purpose and perspective in which PPPs could be viewed by various academics and practitioners whenever need arise to introduce a PPP in a preferred sectors. For this study in particular, the focus is on how the PPP concept could be used in the Water and Sanitation Sector of Zambia for increased effectiveness.

It is common knowledge that a PPP is a concept founded on the principle of partnership. According to the Oxford Advanced Learner's Dictionary, a partnership is defined as '*a relationship between two people or two organisations*'. Similarly, the Chambers 21st Century Dictionary defines partnership as '*a relationship in which two or more people or groups operate together as partners*' or '*a business or other enterprises jointly owned or run by two or more people etc.*'. It could therefore be deduced from the above definitions that, in a partnership, two or more parties are involved and in this particular concept, the public and private sectors come together to form a partnership. This is also in line with the research by ACCA (2012) that derived and linked a PPP to a partnership and acknowledged that some form of relationship should subsist. The two definitions below also signify the aspect of "relationship".

The ADB (2008) handbook notes that the term "PPP" describes a range of possible relationships among public and private entities in the context of infrastructure and other services, while Fourie and Burger (2000) defines it as an institutional and contractual

partnership arrangement between government and a private sector operator to deliver a good or service to the public with as distinctive elements of a true partnership and a sufficient amount of risk transfer to the private operator to ensure that there are sufficient incentives for the private operator to operate efficiently.

It is therefore discernable from the above definitions of a partnership that a PPP is an undertaking in which two or more partners come together based on their perceived mutually exclusive benefits arising from the agreement.

On the other hand, literature suggests that PPPs were originally treated as a derivative of privatisation movement (Grimsey and Lewis, 2002 cited in Jamali, 2007; Ghobadian et al., 2004). The ADB (2008) handbook acknowledges terms such as Private Sector Participation (PSP) and Privatisation that are also used in line with PPPs. This entails government releasing its stake in a publically owned institution or companies, either partially or in full, to the private sector. The total responsibility for developing, managing and providing public services is transferred to the private sector. Although a PPP concept is often confused with privatisation proper, it simply shares a commonality with privatisation in that PPPs also entail the introduction of private sector management and/or ownership of what traditionally has been the sole preserve of Government (Burger, 2006). However, and according to ACCA (2012), total privatisation of public infrastructure at prices heavily subsidised became politically controversial coupled with issues of national security. This could be seen as a turning point to the current PFI/PPPs arrangements. The issues of privatisation, commercialisation and corporatisation have also been addressed by McDonald and Ruiters (2005) in their edited book on *“The Age of Commodity: Water Privatisation in Southern Africa”*.

They define privatisation as a process where non-state actors are involved in water delivery and where the transfer of ownership and/or decision making responsibility to private interests occurs (in part or in total). Whereas the ADB Hand book (2008) defines privatisation as that which involves the sale of shares or ownership in a company or the sale of operating assets or services owned by the public sector. It is further noted that privatisation is most common and more widely accepted in sectors that are not traditionally considered public services. Nonetheless, McDonald and Ruiters (2005) do acknowledge that subsequent Private Sector

Participation in water follow the so called “French model” which involves PPPs whereby the state continues to own the assets and is involved in the monitoring and decision making of the service delivery, but the actual operations and planning of water services are undertaken by the private entity. This means that water privatisation must be seen as a continuum of public and private mixes, with varying degrees of involvement and exposure to risks by the two sectors (McDonald and Ruiters 2005). This is an indication that there should be some form of symbiotic relationship between parties involved arising from the partnership.

McDonald and Ruiters (2005) cite the following definition for commercialisation or corporatisation:

... process by which market mechanism and market practices are introduced into operational decision making of a water service, e.g. profit maximisation, cost recovery, competitive bidding, cost benefit analysis investments etc. (Stoker 1989; Rendleton and Winterton, 1993; Dunsire, 1999; Leys, 2001; Olcay-unver et al., 2003).

Corporatisation is considered to be the most popular institutional form of commercialisation in Southern Africa where water services are ring fenced into stand-alone “business units” owned and operated by the state but run on market principles. According to McDonald & Ruiters (2005), privatisation should be used as a generic expression for a range of private sector involvements in service delivery rather than a single state of being. The corporatisation model is currently being used in the Zambian WSS sector where the various City, Municipal and District councils have allowed stand-alone business units to run and provide water and sanitation service upon registration by the regulatory authority – NWASCO. Though strides have been made by these business units using limited resource availability (provided by Government, Donors and those generated through user fees), much still remains to be done in order to reach the expected levels of efficiency and effectiveness. Sufficient capital injection from the shareholders (Government) has not been forthcoming thereby exacerbating the problem of infrastructure dilapidation and ultimately poor water reticulation, production, storage and supply.

Private Sector Participation (PSP) contracts are about transferring obligations to the private sector rather than emphasising the opportunity for partnership. This normally overlooks the social agenda leading to legitimate public concerns. A PPP is therefore considered to be more

amenable to the social agenda as opposed to a PSP and thus more preferred in current contractual obligations.

A PPP/PFI is therefore an acceptable strategic option aimed at enhancing public service delivery through the involvement of both the public and private sectors. Its presence and growth has been remarkable especially in Europe and Asia (ACCA, 2012; Hay, 2009, p. 1; Li, 2003) and while the PPP concept seems to suggest that the common denominator is the involvement of both the public and private sectors in the provision and delivery of public service, their context, purpose and perspective may differ from one PPP to another. They have become acceptable strategic options used in symbiotic relationships between the public and private sectors in the delivery of high quality sustainable public services. The symbiotic relationship that subsists between partners could be said to be more of an abstract one rather than absolute. Each partner believes that the benefits or the value to be derived from the partnership is worth much more than the cost of going into partnership and not necessarily that the benefits will be equal to the cost associated with the undertaking. While there is no empirical evidence available to authenticate this assertion, the reasons advanced for going into PPPs point to the fact that each partner derives maximum benefit from the undertaking (Paragraph 2.2.6 on reasons advanced refers). Nonetheless, the PPP concept is still much debated and remains a difficult subject especially on evaluating its performance (Al-Shqairat, 2009; Ghobadian et al., 2004; Li, 2003).

Considering that the PPP concept is still developing and many a countries and scholars are trying to use it as a means of enhancing performance of individual sectors and/or economies at large, the need for performance evaluation and intensified research on the same using various factors in different environments remain critical pedagogical undertakings. This would assist to position existing PPP Models in terms of their levels of performance as compared to other similar or related strategies in financial management. It is for this reason that the research is aimed at investigating how the existing PPP Models could increase effectiveness using dimensions of cost, time and quality to assist in elucidating the need for performance evaluation. Nonetheless, in doing so, there is need for researchers to take into account the dynamic, complex and turbulent environments in which PPPs are introduced and implemented that may make it difficult to evaluate performance especially from the effectiveness point of view.

Nisar (2007) notes that PPPs are about establishing arrangements or contracts that are legally-binding and bring about benefits to both sectors. This entails that each partner is bound by the terms and conditions embedded in the contract and has the right to economic benefits arising there from and as enshrined in the agreement. Similarly, each partner has an obligation to transfer economic benefits to the other party in order to arrive at the mutual benefit. These rights and obligations bring in the legality that subsists between partners in terms of each of the parties being accountable to the other and any form of abrogation may entail either party taking legal action.

The economic benefits are meant to enhance the value that accrues to each partner. For instance, the public sector economic benefits on one hand may come in form of the need to harness the financial resources, cost saving on the meagre public resources, know-how of the private sector etc. This should ultimately result into quality public service delivery and sustained social and economic development. On the other hand, the private sector economic benefits may come in the form of market pursue (seeking other markets) for competitive purposes, capital requirements and/or return on capital employed on the investment among others. Nonetheless, the benefits may vary depending on the intentions and the gravity of the partnership and may to a larger extent justify the reasons why parties go into partnership.

Ghobadian et al. (2004, p. 271) acknowledges some factors that motivate parties going into PPPs and may as well be termed as reasons for going into PPPs (For details on this, Para. 2.2.6 below refers). These include pressure on the public purse, insertion of new market-based principles to public sector management, strong financial position of the private sector and introduction of legislation by institutions such as the European Union, African Union etc. The legislation by institutions in particular allows a certain grouping of countries with a common mutual understanding on certain agreed terms and/or conditionality to deal in a manner that facilitates the enhancement of social and economic developments. Zambia in particular has aligned herself to a number of institutions such as the Southern African Development Corporation (SADC), African Union (AU), Southern African Customs Union (SACU) etc. as a way of harnessing some common benefits available within the grouping. Various other reasons for going into PPPs have been alluded to in paragraph 2.2.6 below and include the above highlighted economic benefits. Nonetheless, these benefits may differ

from one project, country or region to another depending on the ulterior motivate of partners involved.

Similarly, Ghobadian et al. (2004, p. 272) have acknowledged that despite PPP/PFI popularity and their increasing application, there are many definitions and approaches to PPPs. Ghobadian et al. have cite the following definitions: From the Labour Administration point of view, the PPP emphasis is more on the flow of resources and know-how between the public and private sectors for mutual benefit, whereas Hans's emphasis is more on the flow of resources from the private to the public sector rather than a flow of know-how and resources in both directions (Hans's, 2000 cited in Ghobadian et al., 2004, p. 272). Similarly, Fernandez's emphasis is more on ownership of assets remaining with the public (Fernandez, 1999 cited in Ghobadian et al. (2004, p. 272) as opposed to that of Klijn and Teisman whose definition is more on cooperation between public and private actors in which actors develop mutual benefits and/or services and in which risks, costs and benefits are shared and success depends on trust, flow of information and cultural compatibility (Klijn and Teisman, 2003 cited in Ghobadian et al., 2004, p. 272). But according to Ghobadian et al. (2004), PPPs share three key characteristics, i.e. sharing of risks between actors; are long-term relationships; and are construed around a shared aspiration of bringing about a desired public policy outcome (IPPR, 2001cited in Ghobadian et al., 2004). According to ONG (2003), the concept of 'PPP' has been widely used as a method of procurement for public infrastructure all around the world. However, there is no precise legal definition of PPP. PPPs can embrace a range of structures and concepts which involve sharing of risks and responsibilities between the public and private sectors. Increasingly, the concept of PPPs covers a wide range of activities including funding in construction; privatisation and concession of large scale capital-intensive large infrastructure projects through build-operate and transfer (ONG, 2003).

It is noted that there is no one single definition of a PPP and the PPP concept continue being developed in a bid to embrace the needs and requirements of partners involved. As such, a number of selected PPP definitions (including PFI) have been put across by various scholars. These are reflected in the glossary of terms in Appendix 1. An attempt has been made to look at various context, purpose and perspective in which PPPs may be viewed from a selective point of view and in a bid to identify the variations and commonalities arising there

from. This will in a way assist in the determination of a suitable PPP Conceptual Model to be initiated in the Zambian Water and Sanitation Sector. The selectivity is based on a geographical disposition and/or continental basis placing emphasis on countries where PPPs have been implemented on a large scale. Wider research on PPPs based on geographical distribution and/or international level has been done (ACCA, 2012; Ghobadian et al., 2004; Li, 2003). Nonetheless, it is generally acknowledged that PPP still remains a difficult subject and is much debated. In the subsequent sub-paragraphs, we look at PPPs on a case by case basis across a cross section of countries or geographical locations.

2.2.1 The Case for Europe

PPPs are said to have gained importance across Europe as vehicles used to finance public infrastructure (Kappeler & Nemoz, 2010; Li, 2003). It is reported that PPP types cut across arrangements that relate to Outsourcing, Concession, Joint public/private ownership and Privatisation and done in sectors such as water supply, construction, energy, service provision etc. It is further reported that overall, more than 1,300 PPPs contracts have been signed in the European Union (EU) from 1990 to 2009 representing a capital value of more than EUR 250 billion (Kappeler & Nemoz, 2010). Going by the trend of evolution of European PPPs, the number of projects has been increasing on a yearly basis though the trend shows a marginal drop from 2007 to 2009 (Table 2.1 refers). Nonetheless, the majority projects were signed between 2000 and 2009 than before an indication that the PPP concept is still developing.

Table 2.1: Evolution of European PPPs per annum

Year	No. Of Projects	value of projects (In € Millions)
1990	2	1386.6
1991	1	73.0
1992	3	610.0
1993	1	454.0
1994	3	1,148.4
1995	12	3,264.9
1996	26	8,488.2
1997	33	5,278.0
1998	66	19,972.4
1999		.
2000	97	15,018.5
2001	79	13,315.3
2002	82	17,436.2
2003	90	17,357.1
2004	125	16,879.9
2005	130	26,794.3
2006	144	27,129.2
2007	136	29,597.9
2008	115	24,198.0
2009	118	15,740.4
Total	1340	253,744.9

Sources: EIB, HM Treasury, Irish PPP Unit and various commercial databases

Kappeler & Nemoz (2010) further report that whilst the term PPP has been used since the 1990s, there is no single European model for PPP and the range of structures used vary widely. According to Kappeler & Nemoz (2010) in some countries, the concept of PPP equates only to a concession while in others the PPP concept can include every type of

outsourcing and joint venture between the public and private sectors. Nonetheless, the type of PPP to be employed by any country may vary depending on the needs and expected benefits. For instance, Fall et al. (2009) in their report have shown that contrary to other parts of the developing world where water PPPs tended to focus on one main model, countries in Western and Central Africa have experimented with the whole spectrum of contractual arrangement ranging from Concessions to Service contracts.

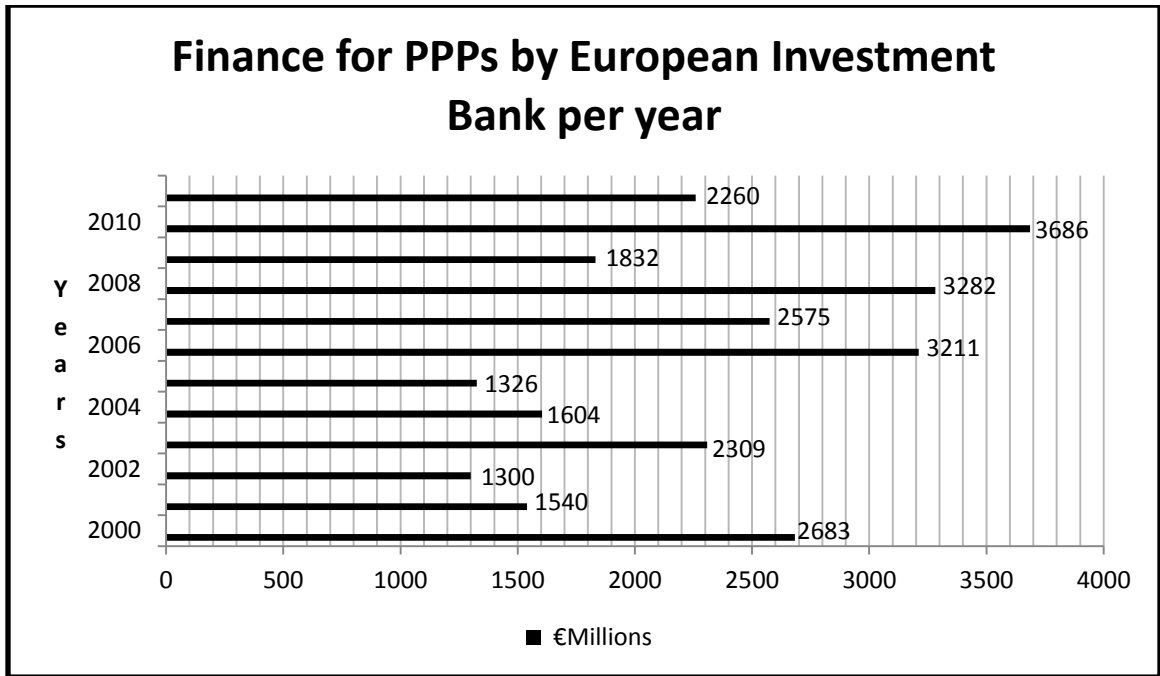
The Case for the United Kingdom (UK)

Li (2003) outlines the PPP evolution history in the UK that dates as far back as the first concession contract awarded by James 1 of England in 1602, through to the industrialisation that swept over Europe and America in the mid to late 19th Century, World War II and the Labour Government in 1997 and beyond. In the UK, both the PFI and PPP concepts are used to embrace Private Sector Participation (PSP) in the delivery of public service. The position of the UK governments on the use of private capital as opposed to funding public sector projects was determined by the Ryrie-Rules that established the criteria under which private finance could be introduced into nationalised industries (Ghobadian et al., 2004, p. 3). The Rules were revised in February 1998 that so the introduction of schemes such as contracting out, opting out, mixed funding and partnership schemes. The Rules were retired in 1989 and superseded by the PFI in the autumn of 1992. The PPP concept was borne after the change of the Conservative Government to the Labour Government as a carryover from the PFI concept used by the Conservative Government. This time around, the need to engage the participation of both the public and private sectors became more pronounced as an acceptable policy guideline aimed at bringing closer partnerships between the public and private sectors.

According to Partnershipbc (2003), the UK has the most PPPs experience of any jurisdiction worldwide for having developed 40 hospitals and 60 others under way; 150 new schools with another 250 underway; and numerous roads and rail investment projects under PPPs. Most PPPs have been financed by the European Investment Bank dating as far back as year 2000. It is reported that between 2000 and 2011, the European Investment Bank financed PPPs in transport, education, water and sewerage, health, solid waste and services to the tune of €27,608 million (European Investment Bank, 2012), Figure 2.1 below refers. According to the PartnershipsUK (2012) and in line with project database of all private-public projects

(primarily PFI schemes), a total of 920 projects have achieved financial close. The PartnershipsUK works closely with HM Treasury and the private finance units of all the Government departments. The HM Treasury collects summary data on UK PFI projects once a year (HM-Treasury, 2012). This collaboration makes the gathering of data and information needed for this purpose.

Figure 2.1: Values of PPPs Financed by European Investment Bank.



Source: From <http://www.eib.org/epec/resources/ppps-financed-by-eib>

Further details on the PPP and PFI concepts as they relate mainly to UK indicate that the PPP concept was a proponent of the Labour Administration while in opposition and became an acceptable strategic option when the regained power in 1997 in an attempt to improve the quality, sustainability and availability of key public services (Smith, 2000 cited in Ghobadian et al., 2004, p. 5). The PPP concept encompasses a wide range of activities - the common thread being increased private sector involvement in the delivery of public services and/or leveraging public assets to generate additional resources (Ghobadian et al., 2004, p. 292). The concept is confined around a symbiotic relationship between the public and private sectors where the public sector looks up to the private sector and vice versa for some form of mutual benefits. The underlying factor is the mutual benefit arising from the symbiotic relationship. This in a way suggests that either partner (public and private sectors) will get

maximum value for money in line with the expected benefits or returns and as agreed by both parties. PPP covers a number of different activities and are classified under the five broad headings (HM Treasury 2000 and IPPR, 2001 cited in Ghobadian et al., 2004) as in Table 2.2 below.

Table 2.2 : Five broad headings of PPP

- Long-term service contracts with the private sector organizations for the provision of a service or group of services;
- The introduction of private sector ownership into state owned businesses, using the full range of possible structures including floatation, strategic partnership, sales of either a majority or minority stakes;
- Strategic partnerships with a wide range of stakeholders including business to formulate and assist in delivery of public policy or bid for funds;
- Wider market to utilize partnership arrangements to exploit public sector assets/know-how commercially for mutual benefits; and
- PFI where private sector partner takes on the responsibility for providing a public service including design, build/enhance, finance, and maintain, the necessary infra-structure.

Source: HM Treasury, 2000 and IPPR, 2001

As to what it takes to ensure value for money is monitored and evaluation, this may depend on the mechanism put in place such as a Monitoring Unit (MU) or Audit Unit (AU) to monitor and evaluate PPP projects. The main objective of the MU/AU would be to monitor and evaluate the efficiency and effectiveness of PPPs in terms of project scope adherence, the cost – benefit analysis, expected implementation time and quality of services provided. In Chapter 13 of ACCA (2012), Winch. M. Graham paragraph on Value for Money and Risk Transfer notes as follows:

“Value for money is achieved by comparing the bids received from the SPVs against a Public Sector Comparator (PSC). If the offer by the SPV makes savings against the PSC, then the offer can be considered value for money and the private finance deal can go ahead. savings to counteract the higher cost of capital raised by the SPV would come from the

transfer of risks to the SPV that under conventional procurement would have been borne by the public sector client”.

Winch further identifies three areas of project risks that would need to be considered in as far as value for money and risk transfer is concerned (ACCA, 2012), i.e.

“The business case for the investment: the appropriate investment decision needs to be made - the problem of “doing the right project”. The area of risk cannot be transferred”.

“The execution of the project: the project phase of the infrastructure development needs to be managed effectively against the figures in the original business case- the problem of “doing the project right”. The risk is central to be transferred”.

“The facility through life: the infrastructure has to be maintained at an appropriate level of availability through its life and subsequently demolished or otherwise disposed of when that life comes to an end”.

On the other hand, the PFI concept is considered to be a form of PPP that marries a public procurement programme to an extension of contracting out (Allen, 2001). It is a private financing initiative which was introduced by the UK government as an alternative means of raising funds for public projects (Nisar, 2007). It allows private companies to finance and manage the assets, and make them available to authorities for a service charge based as far as possible on their performance or availability or the extent of their usage. The Build, Own and Operate (BOO) scheme is normally involved (Nisar, 2007). Risk associated with public service projects are transferred to the private sector in part or in full.

The UK experience with private finance dates as far back as 1984. The genesis of PFI is as a result of the policy inaugural with a white paper on Channel Fixed Link (CFL) in 1984 that was later formalised in 1992 when the Autumn Statement was announced by the UK Conservative Government in a bid to achieve closer partnerships between the public and private sectors (Allen, 2001; ACCA, 2012). This led to the introduction of a range of policies to increase private sector investment in the provision of public services (Allen, 2001). Allen has adequately documented the concept of PFI projects in terms of their scope, types and origins and includes determining as to whether PFI offer value for money in terms of competition, cost overruns and transfer of risks. Costs are a major ingredient in such

undertakings and risks associated with public service projects are transferred to the private sector. The Conservative government committed not less than £100 billion in form of PFI deals between 2001/01 and 2025/26. Table 2.3 and Table 2.4 below provide Allen's summary of the PFI genesis and risk perception and cost aspects respectively:

Table 2.3: The genesis of PFI

The Private Finance Initiative (PFI) was announced in the 1992 Autumn statement with the aim of achieving closer partnerships between the public and private sectors. It was one of the ranges of policies introduced by the Conservative government to increase the involvement of the private sector in the provision of public services. Following two reviews of the PFI by Sir Malcom Bates, the present government has continued to pursue the delivery of some public services through this means.

PFI entails transferring the risks associated with public service projects to the private sector in part or in full. Where a private sector contract is judged best able to deal with risks, such as construction risk, then these responsibilities should be transferred to the private sector contractor. Where the private sector is deemed less able to manage the project's risks, such as whether demand will be high enough, then at least some of the responsibility must remain within the public sector.

The PFI has meant that more capital projects have been undertaken for a given level of public expenditure and public service capital projects have been brought on stream earlier. As at 1 September 2001, there had been almost 450 PFI deals signed with a total capital value of £20 billion. The increased level of activity must be paid for by higher public expenditure in the future, as the stream of payments to the private sector grows. PFI projects signed to date have committed the government to a stream of revenue payments to private sector contractors between 2000/01 and 2025/26 to almost £100 billion.

Source: Allen *Research paper, 2001*

Table 2.4: PFI signed deals by department, as at 1 September 2001

	Number	£ million
Transport, Local Government and the Regions	58	8,289
Health	105	2,502
Defence	37	1,868
Scotland	56	1,865
Home office	39	1,379
Education and Skills	69	1,167
Work and Pensions	7	835
Inland Revenue	8	391
GCHQ	1	130
Wales	11	309
Environment, Food and Rural Affairs	8	249
Lord Chancellor's Departments	7	208
Trade and Industry	8	185
Northern Ireland	22	130
Treasury	1	118
Customs and Excise	1	73
Foreign and Commonwealth Office	4	62
Northern Ireland Court Service	2	58
Office of Government Commerce	1	10
Culture, Media and Sport	3	7
Police Record Office	1	-
Total	449	20,033

Source: Office of Government Commerce

It is discernable from Table 2.4 that 449 PFI projects were done in various sectors valued at more than £20 billion. The common PFI scheme is the Design, Build, Finance and Operate (DBFO) based on 'output' specifications decided by public sector managers and departments. A number of PFI projects have been cited namely, *free-standing projects* where the private sector undertakes a project on the basis that costs will be recovered entirely through a charge

for the services to the final user; *joint ventures* involving projects where both the private and public contributes, but where the private sector has overall control; and *services sold to the public sector* by the private sector often where a significant part of the cost is capital expenditure (Allen, 2009). For this kind of project, the public sector purchaser needs to be assured that the value for money of obtaining services in this way is better than the alternatives.

In the ACCA (2012), Winch describes the UK’s experience with the privately supply of infrastructure for the delivery of public services as mature. Before this, it is reported that the public sector owned and operated public infrastructure while the private sector was restricted to supplying infrastructure. Finance came from general taxation and provision of services was done by public sector employees (ACCA, 2012). By 1997, vast areas of public sector utilities were in the private sector in terms of finance, ownership and operations. The UK experience of private finance is provided in Table 2.5 below:

Table 2.5: UK experience of PFI

1984 – 91	Tentative steps with concessions taken
1992 – 99	Additionality through PFI experimented
2000 – 07	Seeking value for money in public procurement
2008 – to date	Retrenchment and reflection.

Source: Author’s own construction from ACCA research paper, 2012 in a chapter by Winch. M. Graham on the UK experience on private finance.

While the underlying purpose in a partnership is more to do with enhancing public service delivery, the context and perspective seem to depend more on the type of model used such as PPP or PFI Model. Allen’s research notes a few differences between the PPP and PFI though ultimately the common denominator is the participation of both the private and public sector in the delivery of public service. The differences have been highlighted in Table 2.6 below.

Table 2.6: Differences between PFI and PPPs

PFI differs from privatisation in that the private sector retains a substantial role in PFI projects, either as the main purchaser of services or as an essential enabler of projects. It differs from contracting out in that the private sector provides the capital asset as well as the services. The PFI differs from other PPPs in that the private sector contractor also arranges finance for the project.

Under the most common form of PFI, the private sector designs, builds and finances and operates (DBFO) facilities based on 'output' specifications decided by public sector managers and their departments. Such projects need to achieve a genuine transfer of risk to the private sector contractor to secure value for money in the use of public resources before they will be agreed. The private sector already builds most public facilities but the PFI also enables the design, financing and operations of public services to be carried out by the private sector. Under the PFI, the public sector does not own an asset, such as a hospital or school but pays the PFI contractor a stream of committed revenue payments for the use of the facilities over the contract period. Once the contract has expired, ownership of the asset either remains with the private sector contractor, or is returned to the public sector, depending on the terms of the original contract.

Source: Allen's Research Paper, 2001

It is eminent from the above differences that while a PFI is another form of PPP, the private sector assumes the full responsibility in terms of designing, building and financing the project and operating it. The role of the public sector is to make use of the asset by making a stream of committed revenue payments to the contractor over the contract period and ownership is only assumed in accordance with the terms agreed. Nonetheless, the symbiotic relationship subsists as partners like any form of partnership.

France seems to have embraced PPP/PFI since the 1940s and have basically partnered with other countries to carry out a number of PPP options. Nonetheless, the scope and magnitude of PPP/PFI in UK still remain much wider than can be seen from other parts of the world and continue revolving based on experiences accumulated overtime. Kappeler and Nemoz (2010) in their conclusion on research on '*PPPs in Europe – before and during the recent economic crisis,*' conclude that the PPP market in Europe has continued to diversify both across countries and sections. The UK still remains the largest PPP market in Europe though

its share in the total of EU PPPs continues to shrink. They further conclude that PPPs have become more important in other European countries and they continue to diversify across sectors. Other than the use of Private Sector Participation (PSP) for the purpose of private finance, the UK PPPs now involve both the public and private sectors.

2.2.2 The Case for Asia

Considerable research has been done on PPPs in relation to their context, purpose and perspective in Asian countries. In a research commissioned by ACCA (2012), ten (10) countries were sampled and used in taking stock of PPP and PFI around the world. The report conceptualises and addresses various aspects of PPP implementation in some Asian countries and articulates well the concepts of both PPP and PFI by looking at individual countries case studies. While the PPP concept has been embraced globally, literature based on research done in Asian countries still suggests that there are still some gaps in the way PPPs are perceived in different parts of the world. In other words, the PPP concept is looked at differently and there seem to be different ways or approaches to initiating and implementing PPP arrangements and perceived benefits therefrom. Based on the ACCA (2012) research, and as reported by various authors, a number of aspects on PPPs have been highlighted below:

China (by Wang, Ke and Xie)

Wang et al. in their chapter on PPP implementation in China conclude:

“...PPP has been mainly implemented in China in the road, water and power sectors and has been expanded gradually to solid waste, gas, rail and public services. There are different PPP models in China but BOT has been most prevalent, especially in the 1990s. PPP implementation in China has experienced some difficulties owing to the lack of PPP expertise and the inadequate national- level legal framework and regulations in the 1990s..... Although PPP has been successfully implemented in many projects in different sectors, there is still much room for improvement, especially in the project evaluation, procurement and decision-making processes, public accountability, financial market and the fair risk-sharing mechanisms in the concession agreement, such as tariff adjustments” (ACCA,2012).

India (by Gantam Ray)

Ray in his chapter on PPPs in India: recent policy initiatives and investment trends concludes that “India has acknowledged the need for a robust PPP strategy in order to boost capital investment inflows and due to the high growth rate experienced averaging 7 percent over the last decades, it calls for considerable capital investment in infrastructure in order to boost up the supply constraints and demand for new capacity in transport infrastructure, energy and telecommunication sectors. Higher level of good-quality infrastructure will also facilitate entry of global players and foreign direct investment across the Indian economy and with greater levels of private investment in infrastructure projects, the Government will be in a better position to provide budget support for critical services such as water supply and solid waste management, invest more capital resources in electrification, irrigation and water resources. These developments call for a robust PPP strategy aimed at boosting the inflow of capital investment funds”.

Ray further notes that “the recent spurt in capital flow in PPP projects suggests that the private sector is beginning to appreciate the potential returns of these projects. Nonetheless, leading global infrastructure construction companies have not yet effectively responded to the problem of globally tendered bids in India’s PPP projects. Similarly, domestic players who can develop good-quality infrastructure within time and cost constraints are too few in number. As such, significant numbers of projects have been drawing no qualified bids or only single bids leading to cost and time overruns and no private sector efficiencies being harnessed adequately. For this reason, value for money for PPP projects in India has been sub-optimal or below its true potential” (ACCA, 2012).

The aspect of cost and time overruns as they related to PPP procurement is also noted by Ahadzi (2004).

Indonesia (by Pradono, Wishnu Bagoes Oka & Diandra K. Pratami)

Pradono et al. concludes that “the Government of Indonesia continues to play a central role in policy development and maintains control of the implementation of PPP through Government bodies such as National Planning Agency, KKPPI, IIF and the Ministry of Finance. Although the private sector and other partners are expected to finances 69 % of the

infrastructure projects in Indonesia, the Government is still a key player in infrastructure development. This can be seen by the implementation of the modified – BOT Model in most PPP projects in Indonesia, where the Government participates in the infrastructure financing as the major shareholder together with the private sector as the minor shareholder. The Government’s role in PPP implementation can also be seen in the PPP schemes where GCAs and the authorisation and licensing body are the regulatory authorities, responsible for ensuring that project meet the required standards and are implemented according to their contractual agreements” (ACCA, 2012).

Correspondingly, Zambia has in place a PPP unit to ensure that PPP projects are properly implemented.

Japan (by Onishi and Kobayashi)

Japan has used private finances for public service provision as far back as 1980s with the PFI expected to be an alternative model for enabling access to private capital. Onishi and Kobayashi conclude that “Japan’s PFI has seen constant growth for the last decade but at the same time those experiences have left several challenges in exploiting a ‘real’ benefit of PFI. Japan’s PFI has been driven by the merit of bringing additionality to public finance rather than economic efficiency. It was distorted by the inappropriate off-balance sheet accounting treatment and a value for money evaluation method that was vulnerable to manipulation. ‘Hakomono’ PFI has become a dominant model and not likely to result in VFM and has been less attractive even for the private sector. The national PFI policy is moving in a new direction in order to exploit the ‘real’ PFI benefits. Thus the Government of Japan intends to be less dependent on the type of projects it has to reimburse and embark on new model chargeable to users such as concessions. It aims to exploit VFM in terms of both cost and quality; take measures to reduce transaction costs; and that relevant players should have a correct understanding of the nature of PFI, e.g. enough knowledge and ability to assess the stability of the governance structure of projects and to identify the potential risks that may arise from the opportunistic behaviour of private companies” (ACCA, 2012).

Malaysia (by Khairuddin Abdul Rashid)

Rashid concludes that “Malaysia’s PPP has two main components, namely privatisation and PFI and the former implemented in 1983 and the later from 2006. The terms PFI and PPP are often used interchangeably. While shortcomings were experienced with privatisation, they have been resolved through the later versions of PFI. The Tenth Malaysia Plan aims to strengthen the delivery processes of PPP projects and its PPP Model is approaching maturity. Malaysia’s PPP appears to be a home-grown series of initiatives with little foreign involvement in the way the PPP has been formulated, implemented and funded. PPP projects have been implemented using indigenous expertise without encountering major set-backs or difficulties. Nonetheless, a number of problems have been experienced such as:

- Absence of a formal and robust scheme for evaluating PPP projects including a Public Sector Comparator (PSC).
- Absence of standard forms of contracts for PPP projects.
- Lack of participation of private-sector banks and other financial institutions in funding PPP projects.
- Lack of capacity building to equip civil servants and professionals in PPP projects supervision, especially in life cycle costing and in facilities management.

Nonetheless, despite the criticism, Malaysia enjoys many benefits arising from the implementation of PPP” (ACCA, 2012).

Singapore (by Asanga Gunawansa)

Gunawansa reports that for Singapore, “a PPP is a feasible procurement method and has a very conducive environment for PPP projects. Nonetheless, few PPP projects have been implemented since introduction of the concept in 2003 due to some barriers, thus the need for some improvements. The report further notes that, however efficient and transparent the current procurement mechanism is, the use of open tenders may not always be the best procurement practice of PPP because it limits the scope of private sector participation to projects specifically identified by government” (ACCA, 2012).

South Korea (by Do and Park)

They conclude that “Government is actively promoting private investment in areas where private entities prove more efficient and competitive in supplementing the government’s budget. PPPs will therefore continue to play an important role in expanding and improving infrastructure facilities in South Korea. Nonetheless, the use of PPP is not expected to be smooth due to Korean government adopting a double entry bookkeeping system in January 2009 to improve the efficiency, clarity and responsibility of public financial affairs. This has created difficulties in understanding the new accounting methods” (ACCA, 2012).

Thailand (by Veerasak Likhitrungsilp)

The report concludes that “the use of PPP in infrastructure project development has been gradually increasing since the 1980s, starting with transport infrastructure projects, and expanding to energy and telecommunication projects during the 1990s. There has been very limited use of PPP in the water utility sector despite the sectors urgent need for investment and further development to address serious underlying social and economic problems. The main provider of financial resources for PPP projects in Thailand are the Government budget, domestic loans and foreign loans. The availability of PPP is no longer challenging but the country needs to focus more on the quality of services delivery, management and regulation. Thai PPP regulatory and legal framework still has many flaws that might diminish the benefits of the PPP implementation. These include incomplete and obsolete legal framework; institutional and regulatory fragmentation; and undue political intervention. Similarly, there is no official guidance on standardisation of PPP contracts. Thai has therefore proposed short-term and long term strategies which include the creation of a National PPP Unit, legislative amendments and human resources development scope of private sector participation to projects” (ACCA, 2012).

Overall, it is discernible from the Asian countries experiences that the PPP concept hinges on addressing many facets of social and economic challenges ranging from capital additionality to social and economic developments facing individual countries. For instance, issues of budget constraint, need for foreign direct investment, the need for foreign and local participation as partners in development; the need for PPP expertise and adequate legal framework; the need for proper PPP evaluation, procurement, decision-making process,

public accountability, financial markets and fair risk sharing. PPP systems should therefore be put in place aimed at improving their implementation, monitoring and evaluation and ultimately value for money. The above lessons from the Asian experience are important to the Zambian case and would provide a valuable learning agenda to Zambia in the process of PPP initiation, implementation, monitoring and evaluation.

In a research by Cheung et al. (2009b) on reasons for implementing PPP projects based on PPP experience in Hong Kong and Australia, compared with previous research in the UK, they highlight a number of reasons for implementing PPPs. The term PPP is said to be more revolutionary to Hong Kong than that of Build Operate and Transfer (BOT) that has been used since the late sixties. This follows the successful BOT project on the Cross Harbour Tunnel (CHT) that finished way ahead of schedule and was able to pay back its construction cost within a reasonable time. Cheung et al. (2009b) report that the Efficiency Unit of the Hong Kong Special Administrative Region Government has made a number of research and publications on PPP and provided a number of insight and guidelines to the operators on what needed to be followed. Publications include among other things how to establish a project in terms of the business case, dealing with the private sector, managing risks, funding and payment issues, managing performance etc.

The development of policy guidelines in the implementation of PPP project has also been embraced in Australia where the Partnership Victoria Policy was issued in June 2000 (Cheung et al., 2009b). A number of publications have been made for the use of both the private and public sectors and to cover areas such as public sector comparator, risk allocation, standard commercial principles, tender process, interest rates etc. (Partnerships Victoria, 2008 cited in Cheung et al., 2009b).

Based on Cheung et al. (2009b) research, it is indicative that while the PPP purpose appears to be common in terms of involvement of private sector and utilisation of its resources in the provision and delivery of public services, PPPs are perceived differently in terms of context and perspective. Cheung et al. (2009b) conclude that there are variations in terms of reasons for implementing PPP projects as seen from the Hong Kong and Australian perspective. This is also authenticated in paragraph 2.2.6 below.

2.2.3 The Case for America

Both North and South America have had their side of PPP cutting across different phenomenon and based on their geographical disposition. Different types of PPPs have been initiated and implemented in USA, Canada, Latin America etc.

Li (2003) reports that PPPs have been so important to the success of modernising Government in the USA. This led to the USA National Performance Review to change its name to the National Partnership for Reviewing Government in 1998 in order to help create a Government that works better and cost less in time for the challenge of the 21st century (NPRG, 2000 cited in Li, 2003). A very wider range of PPP such as strategic partnerships, co-operated partnerships and investment partnerships are said to support the economic success. PPPs are done in form of privatisation especially in small cities. This is said has witnessed interest in the privatisation of government, produced services, particularly at the country and municipal level. Investing in the social sector is considered as a strategic business investment that stimulates private sector business development. According to Li (2003), this has led to the following undertakings:

- Hundreds of thousands of housing units having been constructed as a result of PPP (Martin, 1996)
- While the majority of the USA's wastewater treatment operations are still currently run by public entities, there is a major push underway to move towards privatisation of these facilities (Donnellon, 1997).
- Joint venture between Wheelabrator Environmental System, Inc. and Treated Water Outsourcing (TWO) formed a strategic alliance that pursued industrial outsourcing projects for wastewater Treatment. Its main purpose is to design, build, own and operate the treatment facilities and treat water and wastewater on customer sites.
- United Water Resources, Lynonnaise American Holdings and Montgomery Watson plan to provide operations and management services to municipally – owned water and waste treatment facilities (Donnellon, 1997).
- American Anglian Environmental Technologies (AAET) announced its negotiation with the Buffalo (NY) Water Board for the operation, maintenance and management

of that city's treatment facilities, as well as water supply. An important aspect of AAET's proposal was the company's inclusion of a comprehensive training program that offered employees opportunities for personal growth, while improving performance and enhancing operations safety.

As for Canada, Li (2003) reports that PPP practices in Canada are mostly similar to the UK for setting financial restriction and innovating public services. PPP procurement in Canada has been driven by a desire to provide new infrastructure. PPPs are normally between Government and private business sector to deliver public services and provide a new environment for change at strategic level. An example given is that of outsourcing the hospital in terms of products, services, contract management and the contracting out of management and the means of production. More attention was paid to a couple of revenue generating assets in its property management portfolio, i.e. its parking lots and its 400 – apartment residence building (Stonehouse et al., 1996 cited in Li, 2003).

2.2.4 The Case for Western and Central Africa

Fall et al. (2009) have comprehensively documented the regions experience with PPPs for urban water supply in a bid to help Africa achieve the MDGs. They report that Western and Central Africa has one of the longest experiences with PPPs in the developing world dating as far back as 1959 and that a wider range of PPP schemes have been implemented in the areas of Concessions, Affermages, Management contracts and Service contracts (Fall et al., 2009). These schemes are common in many countries that have experienced PPP in one form or the other. Countries in which PPPs have been implemented include Gabon, Cape Verde, Mali, Cote d'Ivoire, Senegal, Niger, Guinea Bissau, Central African Republic, Cameroon, The Gambia, Chad, and Ghana. It is reported that while other regions of the developing world implementing water PPPs for their urban utilities have often tended to focus on one contractual model, Governments in Western and Central Africa has experienced with a wide range of options, from performance-based service contracts for improving commercial and financial operations of the public water utility in Burkina Faso to the full concession of the water supply service in Gabon. Their performances have also been described as mixed (successes and failures) with reasons learnt documented for future PPPs

to be undertaken. Fall et al. (2009) provide a summary of PPPs status and overall assessment as per Table 2.7 below.

Table 2.7: Water PPP Experience in Western and Central Africa

Water supply utilities				
Country	Type of PPP	Period	Status and overall assessment	Rating
Côte d'voire	Affermages	1959-	Active. Good performance; a PPP reference	Success
Senegal	Affermages	1996-	Active. Good performance: a PPP reference	Success
Niger	Affermages	2001-	Active. Improved service and efficiency despite difficulties.	Success
Burkina Faso	Service	2001-	Completed. Improved service and efficiency.	Success
Ghana	Man. contract	2005-	Active only since 2005	N/A
Guinea	Affermages	1989-1998	completed but not renewed. A few improvements	Mixed
Central A R	Affermages	1991-2001	Completed but not renewed. No performance data	Failure
Cameroon	Affermages	2007-	Awarded in 2007. Active only since 2008	N/A
Combined Power/Water Utilities				
Gabon	Concession	1993-	Active. Good performance despite recent difficulties	Success
Cape Verde	Concession	1999-	Still active following partial retreat of private operator. Mixed outcome	Mixed
The Gambia	Affermages or Lease contract	1993-1995	Early termination following conflict, little/or no improvement	Failure
Chad	Management contract	2000-2004	Early termination following conflict, little/or no improvement	Failure
Mali	Concession	2001-2005	Private operator has left after sizeable improvements	Mixed
Guinea Bissau	Management contract	1991-1997	Completed but not renewed. No performance data.	Failure
Sao Tome	Management contract	1993-1996	Completed but not renewed. No performance data	Failure

Source: Fall et al., 2009

Base on the water supply utilities, it is evident that Affermages contracts have been successful in Côte d'voire, Senegal and Niger while in Guinea the performance was mixed and failed in Central African Republic. A Service contract was also successful in Burkina Faso. On the other hand, and based on the combined power/water utilities, affermages, concession and management contract were assessed as not being successful except for a concession contract in Carbon.

2.2.5 The Case for Southern Africa

The Southern African Development Community (SADC) Perspective

PPPs have taken shape in the Southern African Region and a number of countries have engaged in PPPs in one way or the other in a bid to enhancing public service delivery. During a Southern African Development Community (SADC) PPP forum and network launch that was held in February 2011, and attended by 130 countries to establish a SADC PPP Practitioners Forum and the launch of the PPP Practitioners Network, a number of aspects were raised in order to give the context, purpose and perspective on PPPs/PPI (SADC, 2011). During the forum, expert speakers where allowed to highlight the realities, challenges and constraints associated with PPPs in various disciplines and sectors. Using a case example of Health PPP project in Lesotho and two country case studies for India and Nigeria, the forum outlined the benefits of embarking on a structured drive to attract PPI while pointing out problematic areas that could be avoided by a capacitated public sector. Similarly, the speakers on the launch of the PPP Practitioners Network shared their experiences of global and regional networks and the SADC affirming its mandate to leverage private sector funding for infrastructure through PPPs. The forum was informed that the Finance and Investment Protocol has been ratified by member states and is expected to expedite PPPs in infrastructure and development programmes. It was also reported that another SADC initiative is to strength the capacity of financial institutions with the intention to get bankable projects in the region and the establishment of the SADC Project Preparation and Development Facility and the Regional Development Fund. Nonetheless, the emphasis was that SADC Governments should develop strong PPP Units to provide guidance and an appropriate policy and regulatory framework consistent with economic policy and regionally synergised to promote and not hinder regional PPP development.

Zambian perspective

From the Zambian perspective, a PPP is defined as an arrangement between public and private sectors with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act of 2009). It is therefore confined around shared objectives as opposed to traditional public sector procurement (Government of the Republic of Zambia, 2009). This is a hybrid kind of definition that recognises that a PPP is an instrument or strategy for transforming public services with the involvement of mainly the private sector. It aims to foster cooperation between public and private actors with a durable character in which actors develop mutual products and/or services and in which risk, costs, and benefits are shared (Ghobadian et al., 2004; Peters, 1998 cited in Li, 2003). Zambia has an establish PPP Unit under the MOFNP and has so far been involved in the implementation of PPPs in a number of sectors such as transport (roads, harbour, railways and border post support infrastructure), energy, housing and markets, agriculture etc. These cut across Concessions contracts in the form of BOT/Tolling, maintenance, and BOOT, Management contracts and Service contracts. All the PPPs are initiated and implemented under the PPP Policy and Act of 2009. Other than a trail management contract that was implemented by AHC (refer to a case for AHC paragraph below) in the Water and Sanitation Sector in the Copperbelt just after the mines were private that used to offer free water and sanitation to the mining community, there has been none of these arrangements in the Water and Sanitation Sector other than grants and subsidies from both Government and/or grant and loans from cooperating partners such as the World Bank.

South African perspective

In 1994, South Africa set about reforming the approach of Government towards the management of state assets, a move aimed at increasing the use of institutional hybridity and a move from Government to governance through the use of PPPs (Burger, 2006). According to Burger, 2006, the National Treasury's PPP Unit was established in 2000 to play a key role particularly in the creation of PPPs and have the final authority to approve PPP agreements although the initiative and ultimate management of PPP agreements originates and rests with

individual Government departments and provinces. Burger (2006) provides three main reasons for the creation of a dedicated PPP Unit as follows:

- (a) A dedicated PPP unit is the ideal instrument to monitor and judge the affordability of a project, in particular since it acts as a regulatory body within Government, but at arm's length from the department that wants to implement the PPP.
- (b) A dedicated PPP unit could eliminate free-rider problem by still leaving the initiative to initiate a PPP, as well as the ultimate day-to-day management of the contract, to the individual Government department, while the unit, situated in the treasury, has the authority to judge and approve the ability of an individual department to afford the PPP agreement.
- (c) A dedicated PPP unit may be established to create a centre of knowledge and expertise that can provide individual departments with technical assistance during the creation process of a PPP and keep a watchful eye on departments through its regulatory approval mechanism. It also serves as a centre of expertise and increases the confidence of potential private sector partners.

The National Treasury PPP Unit defines a PPP as a contract between a public sector institution/municipality and a private party in which the private party assumes substantial financial, technical and operational risk in the design, financing, building and operation of a project (National Treasury PPP Unit, 2013). Other than the partnership, the definition emphasis is more on the private party assuming substantial financial, technical and operational risks. Two types of PPPs are specifically defined and include where the private party performs an institutional/municipal function and/or where the private party acquires the use of state/municipal property for its own commercial purposes. A PPP may also be a hybrid of these types. In terms of payments in any scenario, three mechanisms are used namely; the institution/municipality paying the private for the delivery of the services, or the private party collecting fees or charges from users of the services, or a combination of these (National Treasury PPP Unit, 2013). As at November 2011, about twenty-two (22) PPP projects have been signed in terms of Treasury Regulation 16 and cut across various sectors of the economy. Eighteen (18) are in the form of Design, Finance, Build, Operate and transfer (DFBOT) and range between 10 – 30 years in terms of duration whereas three (3) are in the form of Design, Finance and Operate (DFO) and are for 5 years each in duration

(National Treasury PPP Unit, 2013). Similarly, several projects are in preparation and registered in terms of Treasury regulation 16 and Municipal projects registered as at March 2013 at National, Provincial, Municipality, and Public Entities and Transaction Advisors either appointed or not yet appointed. These are in Fleet, Accommodation, Rail, Water, Education, IT, Energy, Health, Tourism, Housing, and Waste sectors. Other than the Treasury Regulation 16, issued in 2004 as part of the Public Finance Management Act of 1999, Government has also issued a series of National Treasury PPP Practice Notes and include a PPP manual and standardised practice notes. Municipal PPPs operate under the Municipal Public-Private Partnership Regulations, issued in 2005 in terms of the Municipal Finance Management Act of 2003. The PPP Unit of National Treasury in South Africa has provided municipalities with a type of blueprint guideline to take them through all the compliance issues but with logic thus not killing creativity. These provide the legal and regulatory framework for PPPs to be carried out in South Africa. Nonetheless, Burger (2006) reports that although the legal and regulatory framework is quite advanced, the country has a long way to go in the rolling out of PPPs.

There is a focus on PPPs for essential basic services for which the know-how do not exist in municipalities, e.g. water treatment works and revenue generating projects. Need therefore arises for skills development in this area and a PPP could just as an ideal option. However, there are a number of waste reduction and waste to energy projects in South Africa as well as two water concessions that provide ample material for knowledge exchange. There is also a specific broad black economic empowerment legislation that all PPPs must adhere to irrespective of the cost. Nonetheless, the National Treasury in South Africa does prescribe all PPP processes through legislation but some through guidelines. As a case example, in 2001, a five-year PPP management contract emerged as a way to bring new expertise and efficiency to the delivery of public utility services and included among others the Johannesburg water and was considered so successful based on the following parameters (World Bank, 2010):

- A high level of political commitment to the PPP from the start,
- The management contract had a simple clear objective, i.e. to establish a viable, corporatized public water utility with well-defined performance targets,

- The municipality was able to adopt a flexible approach to measuring the year-by-year impact of the private operator,
- Both partners were committed to success and worked well together, and
- A strong focus on developing human resources.

A Build-Operate-Train-Transfer (BOTT) program has also been implemented in a water system in South Africa though according to Gentry and Fernandez (1997), this kind of PPP has not yet been widely applied. Li (Op.cit) confirms this position.

Generally, African States are now recognising that PFI/PPP is probably the most effective way for them to go forward in a bid to ensure that technology is transferred from developed to developing countries (Li, 2003). It is also considered as a supplementary strategic option aimed at assisting Governments' improve on dimensions of cost, time and quality effectiveness in the provision of public services. This is supported by the fact that developing countries lack the necessary resources to effectively enable improved social and economic malaise. According to the SADC (2011) forum, it was heightened that currently there is urgent need for increased PPI in Sub-Saharan Africa and that PPI already contributed 29 percent of the US\$25 billion capital investment in Sub-Sahara Africa with transport attracting more PPI than energy and only about 1 percent of PPI being invested in water by private households. Nonetheless, it should be noted that there is some political interference in PPPs in Africa and PPP Practitioners should realise that investors do thorough research on potential PPP market countries and must therefore be prepared to talk about politics, economics and technical matters.

2.2.6 Reasons/Benefits and Arguments behind PPP

Overall, a number of reasons and arguments have been advanced for going into the PPP arrangement although there seems to be a common thread in the various reasons advanced. Literature suggests that PPPs were originally treated as a derivative of privatisation movement (Grimsey and Lewis, 2002 cited in Jamali, 2007; Ghobadian et al., 2004). This entails government releasing its stake in a publically owned institution or companies, either partially or in full, to the private sector. The total responsibility for developing, managing and providing public services is transferred to the private sector. However, and according to

(ACCA, 2012), total privatisation of public infrastructure at prices heavily subsidised became politically controversial coupled with issues of national security. Nonetheless, there has been a noticeable shift in the manner PPPs are looked at and applied both from the public and private sector point of view.

PPPs are now considered in many facets such as being a strategic partnership tool for reaping mutual benefits (Jamali, 2007; Trafford and Proctor, 2006; Roumboutsos and Chiara, 2010; Grant, 1996 cited in Li, 2003). They enable government meet a wider range of policy objectives and aligning risks and responsibilities between the public and private sectors (Ghobadian et al., 2004); tackle challenges such as enhancing public sector performance, high public service cost, budget constraints, absence of required skills in public sector bodies and absence of incentives to reward performance (Al-Shqairat, 2009). Most researches have also established that PPPs are able to enhance Value for Money (VFM) (Cheung et al., 2009a; Nisar, 2007; Zou et al., 2008; Pitt and Collins, 2006). Allen reports that the PFI (another form of PPP) is able to provide value for money from the cost perspective though not in all cases (Allen, 2001, pp. 30 – 33). According to ACCA (2012), a PPP enables governments' to invite private sector entities to finance and develop infrastructure projects without losing state control over the regulatory aspects of service provision, including the pricing of the services provided by the infrastructure facility. The driver is therefore the demand for infrastructure development and government's ability to meet its funding. In other words, it is the issue of capital additionality and public funding capacity that seem to override the reasons for going into PPP arrangements.

A number of related arguments have been advanced for going into PPPs. For instance, Ghobadian et al. (2004, p. 271) argue that the increasing trend towards contracting out the delivery of public services through PPPs is motivated by pressure on the public purse, insertion of new market-based principles to public sector management, strong financial position of the private sector and introduction of legislation to break territorial monopolies and encourage market liberalisation. In a related research paper by Cheung et al. (2009b) using questionnaire respondents comprising experienced practitioners from the industry in Hong Kong, Australia and UK, similar trends were cited as reasons for implementing PPP projects. These include private incentive, high quality of service required and shortage of government funding (ranked first by Hong Kong, Australia and UK respectively); economic

development pressure demanding more facilities (ranked second by all) and high quality of service required, inefficiency because of public monopoly and lack of competition and avoid public investment restrictions (ranked third by all) respectively thus authenticating Ghobadian et al. (2004) assertions (Table 2.8 refers). However, Cheung et al. (2009b) have shown that reasons may vary from one project to the other as seen by various preferences by respondents from Hong Kong, Australia and UK. Lattemann et al. (2009) disagreed with Ghobadian et al. (2004) assertions stating that reasons differ from project to project in agreement with Cheung et al. They may also vary from country to country or project to project. In the UK, for instance, the most significant component of PPPs is contracting out and PFI (subset of PPPs) (Ghobadian et al., 2004, p. 5); development of infrastructure and/or provision of services or a combination of the two (Fall et al., 2009). The UK Labour Administration used PPPs in an attempt to improve the quality, sustainability and availability of key public services (Smith, 2000 cited in Ghobadian et al. 2004). While the recent study by Certified Accountants Educational trust (CAET) on *'Taking Stock of PPPs and PFIs around the World'* in which 2 European and 8 Asian countries were sampled concurs with other research findings on what drives PPPs, (lack of finance, need for modern technology and/or for effective and efficient management skills, and the need to transfer risk) and concludes that capital additionally is the main driver (ACCA, 2012). The report also authenticates that there are diverse nature of reason for engaging into PPPs and while acknowledging that PPPs are a common phenomenon worldwide (ACCA, 2012). However, Nisar (2007) concludes that it is not simply about the financing of capital investment, but about exploring the full range of private sector management, commercial and creative skills in providing public services and facilities. It is about delivering better service by combining the strengths of the public sectors working in partnership, each focusing on the areas it does better.

Table 2.8: Mean scores and rankings of the reasons for implementing PPP projects

	Hong Kong			Australia			UK (Li,2003)		
	<u>n</u>	<u>Mean</u>	<u>Rank</u>	<u>N</u>	<u>Mean</u>	<u>Rank</u>	<u>n</u>	<u>Mean</u>	<u>Rank</u>
Economic development pressure									
demanding more facilities	33	3.48	2	11	3.64	2	61	3.34	2
Political pressure	33	2.79	9	11	2.45	8	61	3.24	4
Social pressure of poor public									
Facilities	33	2.88	8	11	3.09	5	61	3.12	5
Private incentive	32	3.58	1	11	3.09	4	61	2.57	9
Shortage of government funding	33	3.24	6	11	2.64	7	61	3.9	1
Inefficiency because of public									
monopoly & lack of competition	33	3.33	4	11	3.09	3	61	2.98	6
High quality of service required	33	3.42	3	11	3.91	1	61	2.7	7
Avoid public investment									
restrictions.	33	2.97	7	11	2.18	9	61	3.31	3
Lack of business & profit									
generating skills in public sector	32	3.31	5	11	2.82	6	61	2.62	8

Note: n = number of survey respondents

Source: Cheung et al, research on Enhancing VFM in PPP projects: Findings from a survey conducted in Hong Kong and Australia compared to findings from previous research in the UK; 2009a.

The Asian Development Bank (ADB) (2008, p. 3) handbook identifies three (3) main needs that motivate governments to enter into PPPs for infrastructure development namely;

- (a) The *need to mobilize private capital* in order to supplement public resources or release them for other public needs. Governments recognise the ever-increasing need to find sufficient financing to develop and maintain infrastructure required to support the growing populations. According to ADB (2008), the demand of increasing urbanisation, rehabilitations of aging infrastructure, the need to expand networks to new populations and un-served or underserved areas, and infrastructure operating deficit have been cited as reasons for private capital mobilisation. These constitute an additional drain on public resources needed for the provision of other competing

services in the public sector. In other words, the mobilisation of private capital is motivated by governments' limited financial capacity. A PPP may be able to mobilise previously untapped resources from the local, regional or international private sector which is seeking investment opportunities. This is similar to the assertion by ACCA (2012) of the need for capital additionality.

- (b) *The need to use PPP as a tool for greater efficiency and the use of available resources in a more effective manner.* This is a critical challenge for most governments considering that the public sector has few or no incentives for efficiency structured into its organization and processes and is thus poorly positioned to efficiently build and operate infrastructure. Injection of such efficiencies is therefore needed. The current study also looks at how effectiveness could be enhanced using existing models of PPPs.
- (c) *The need to use PPP as a catalyst for broader sector reform* through a reallocation of roles, incentives and accountability in order to allow the mobilisation of capital and achieve efficiency and support the new allocation of sector roles. Need arise to re-examine and reallocate the roles of policy makers, regulator and service provider in order to remove the potential conflict and to consider a private entity as a possible sector participant. This is critical to the success of a PPP project.

As for the private sector, the need to profit from its capacity and experiences in managing businesses is a greater motivator. They seek for compensation for its services through fees for services rendered to result in an appropriate return on capital invested (ADB, 2008).

The Partnershipbc (2006) provides a number of benefits associated with PPPs. At least seven benefits have been alluded to in favour of government and tax payers namely, improve service delivery; improve cost-effectiveness; increase investment in public infrastructure; reduce public sector risk; deliver capital projects faster; improve budget certainty; and make better use of assets. As for the private sector, the benefits are to do more with access to secure, long-term investment opportunities. They can profit from PPPs by achieving efficiency, based on their managerial, technical, and financial and innovation capability. They are able to expand the PPPs capacity and expertise.

While some developed countries such as Europe may view the concept of PPP as being driven by value for money and risk factors, the underlying factors is that, PPP is basically a financing strategy (raise finances) or capital additionality strategy (ACCA, 2012). This is true with developing countries that consider PPPs not only as a means of enhancing public service delivery with value for money and risk factors in mind but also as a means of raising additional capital from the private sector. While these PPP drivers are all acceptable as seen from various contextual dimensions, this research argues that the magnitude of the partnership may largely depend on the arrangement or motive behind as seen and acceptable to both parties involved. Reason may cut across a broader spectrum but possibly categorised as being finance and non-finance in nature such as social, economic, legal, and political factors. The political factor is more of a strategy to appease the public (electorates) especially in times of elections. In a research on value for money drivers in PPP schemes, Nisar (2007) cites three broad arguments in favour of PPP.

- Benefit the Treasury by enabling public sector projects undertaken without swelling government debt or trigger the need for tax increase;
- Provides a competitive and cost-attractive alternative to traditional public sector projects; and
- Bring in proven project management expertise.

In another related research by Li et al. (2005) into perceptions of what makes the PPP/PFI attractive or unattractive as a procurement system for projects in UK, and based on the positive and negative features that influence the attractiveness of PPP/PFI in the delivery of public facilities and services as summarised by Li et al. (Op.cit) (Table 2.9 refers), better project technology and economy, greater public benefit, public sector avoidance of regulatory and financial constraints and public sector saving in transaction costs were found as most attractive in terms of positive factors whereas inexperience of participants, over commercialisation of projects and high participant cost and time as negative aspects.

Table 2.9: Positive and Negative factors as summarised by Bing Li, A.Akintoye, P.J. Edwards & C. Hardcastle, 2005

POSITIVE FACTORS	NEGATIVE FACTOR
<ul style="list-style-type: none"> • Transfers risk to the private partners • Caps the final service costs • Reduces public sector administration costs • Reduces public money tied up in capital investment • Solve the problem of public sector budget restraint (Akintoye et al. 2001) • Non-recourse or limited recourse public funding • Reduces the total project cost • Improves buildability • Accelerates project development • Serves time in delivering project • Improves maintainability • Benefits local economic development (HM Treasury 2001) • Transfers technology to local enterprises • Facilitates creative and innovative approaches (Birnie 1999, Government of Nova Scotia 2000) • Enhances government integrated solution capacity (Sohail 2000). 	<ul style="list-style-type: none"> • Few schemes reach the contract stage • Threatened by lack of experience and appropriate skills (Morledge & Owen 1998; Ezulike et al. 1997) • Leads to higher direct charges to users • Imposes excessive restriction on participation • High participation costs are incurred (Ezulike et al. 1997; Saunders 1998; Birnie 1999) • High risk relying on private sector • Confusion can arise over government objectives and evaluation • May lead to high project costs (Ezulike et al. 1997; Birnie 1999; Public Service Privatisation Research Unit 2000) • Length delays caused by political debate (infrastructure journal 2001a, b) • Much management time is spent in contract transaction (Ezulike et al. 1997) • Lengthy delays can arise in negotiation • Reduced project accountability • Offers fewer employment opportunities.

Source: Li, Akintoye, Edwards & Hardcastle, 2005.

Mouraviev & Kakabadse (2012) in the conceptual paper particularly relating to delineating multiple aspects of whether PPPs bring benefits to the society, asserts that PPPs are challenging to the society in a way that an assessment of their benefits as opposed to their costs and negative externalities is a difficult task. Citing notable researchers, they note that delivering public services sooner and cheaper than government in-house provision; opportunity to build, operate and maintain the public sector assets (such as water treatment facility or a recreational centre) with extensive use of private funds; and the use of the private

sector expertise in technology, management, and customer service for implementation of the public sector objectives are among principal PPP benefits. As regards to PPP promises and performance, Hodge & Greve (2005 cited in Mouraviev & Kakabadse, 2012) note that findings about empirical evidence on partnership cost and quality gains are limited and mixed. The argument is that the economic and financial benefits of PPPs are still subject to debate, and hence, considerable uncertainty (Hodge & Greve, 2005 cited in Mouraviev & Kakabadse, 2012). The reason for this uncertainty as provided by Mouraviev & Kakabadse (2012) is that the PPP benefits are not clear-cut, and each benefit claim can be countered by some offsetting drawback or higher costs, e.g. a promise for sooner and cheaper public service (as opposed to when the government may begin providing it) may turn in more expensive and delayed delivery by a partnership in case a private sector partner had to deal with unforeseen risks such as paying for damage to the environment or construction flaws. Table 2.10 provides other reason for the economic and financial benefits of PPPs as cited by Mouraviev & Kakabadse (2012).

Table 2.10: Reasons for uncertainty in economic and financial benefits of PPPs

Extensive use of private funds undoubtedly helps governments to keep their budget deficits low, particularly in the short run (Sadka, 2007; Hall, 2008a; Marallos and Amekudzi, 2008). However, government payments to partnerships (such as a subsidy, or capital outlays, or minimum revenue guarantees) simply convert a present budget deficit into future deficits (Sadka, 2007), whilst future deficits may be even larger due to higher cost of private partner loans as opposed to government borrowing at lower, risk free interest rates (Sadka, 2007; Hall, 2008a). Attracting a private sector party in a PPP often costs the government more compared to when it opts to provide a service in-house (Mouraviev, 2012).

An advantage of using the private sector partner expertise in construction, technology, innovation and management becomes compromised when a private company with no prior experience in similar projects receives a PPP contract.

Source: Mouraviev & Kakabadse research paper, 2012.

Mouraviev & Kakabadse (2012) note that a partnership's value for money may be undermined in many ways in relation to partnership's benefits to the society. They argue that generalisations are hardly possible as each project possesses unique financial and organisational arrangements and that even if two projects seem alike in their objectives, scope, time frame, funding, and services to be delivered, it is likely that they will be implemented differently as each project involves a unique set of organisational and financial arrangements and faces its own range of risks and partner interaction issues. It is also noted that the project end will not give an opportunity for a full PPP assessment because government must count and assess its total costs related to the project (Mouraviev & Kakabadse, 2012). The government is likely to face huge costs (much higher than the private company's costs in the late years of a project) that would inevitably become a burden for budget and consequently taxpayers (Mouraviev et al., 2012 cited in Mouraviev & Kakabadse, 2012).

2.2.7 Summary Conclusion

It is discernable from the above that the PPP/PFI concept is quite diverse in context, purpose and perspective and remains a complex undertaking though still developing globally. It has been used globally and signifies an important strategic tool that could be used to leverage the benefits between the public and private sectors. It is also true that a PPP may delineate new concepts depending on the country's contextual environment in which they are undertaken. Nonetheless, there seem to be some commonalities in the manner PPPs are viewed. At least, there are parties involved; some form of contractual obligation to provide a service or otherwise; aspects of risks and related responsibilities; levels of ownership; a strategic option tool to deal with perceived weaknesses of parties involved etc. although these may not all be embedded in one definition. Regardless of the parties involved, either party looks forward to some form of economic benefits that may come in various forms and constitute critical pedagogical factors in enhancing public service delivery. To a larger extent, this determines the reasons or motive behind parties going into PPPs. Nonetheless, the involvement of both the public and private sectors to form a partnership based on their respective perceptions underpins the concept.

Similarly, like in many other developed and developing countries, PPPs have been used and continue to be used in various sectors of the economy such as transport, energy, construction, health, agriculture, water and sanitation etc. Regardless of the sector in question in which the PPP is applied, differences in purpose, context and perspective, a PPP commands a wider acceptance globally thereby making it relevant to any countries context like Zambia. This is also true in that the Zambian MLGH that is vested with the mandate to provide the water and sanitation has commercialised the water supply and sanitation sector through the regulator - NWASCO. Commercialisation is considered to be similar to some form of PPP (McDonald and Ruiters, 2005).

The arguments for and/or against the benefits of PPPs are indeed a combination of both financial and non-financial factors. Nonetheless, the central question in delivering an effective partnership is how to balance social goals with a profit motive as well as how to support innovation whilst still maintaining standards (Todd and Ware, 2000; Moulton and Anheier, 2001 cited in Nisar, 2007). Overall, and whatever the reasons, enhancing public service delivery becomes a common thread for PPPs. This has made PPPs to become a popular strategic option globally. Nonetheless, the context, purpose and perspective in which the PPP concept may be perceived could differ depending on where and how it is applied. ACCA (2012) report acknowledges that reasons may differ and depend on the type of PPP in a particular country, across countries and continents. The main driver is said to be the gap that subsist between the demand for infrastructure development and service provision and government's ability to fund these developments. Mouraviev & Kakabadse (2012) also conclude that only the long-run view of PPPs may offer an accurate assessment of their benefits, costs, and externalities. These to a larger extent could determine the underlying reasons, benefits or motives behind PPP.

PPPs should therefore present a conducive framework within which both the public and private sectors could operate without disadvantaging each other. For instance, the need to acknowledge and structure the role of Government in ensuring that social obligations are met and successful sector reforms and public investment achieved should be reflected in the framework while engaging the private sector. Similarly, the private sector should not be disadvantaged and be denied their reasonable share of expected return from the huge capital

investment made and risks assumed. A strong PPP should be one that allocates the tasks, obligations and risks among the public and private partners in an optimal way.

2.3 PPP Models/Schemes.

Pidd (2003, p. 5) defines a model as an external and explicit representation of part of reality as seen by the people who wish to use that model to understand, to change, to manage and to control that part of reality. They are ‘tools for thinking’, or ‘convenient worlds’ (Pidd, 2003); part of the process of “reflection before action” (Boothroyd, 1978 cited in Pidd, 2003). As for PPP Models, they can be seen from different perspectives depending on the arrangement. Governments in Western and Central Africa and Asia have experimented with a wide range of options from performance – based service contracts to full concession (concessions; affermage - lease contracts; management contracts, and service contracts) (Fall et al., 2009; Locussol et al., 2009: p. 34; ADB, 2008, p. 27). PPP Models can also take the form of Build-Operate and Transfer (BOT); Build – Operate, Own and Transfer (BOOT) and Build, Transfer and Operate (BTO) (Al-Shqairat, 2009; Gunnigan, 2007; Li, 2003). Similar models have also been cited by Mouraviev & Kakabadse (2012) and as captured by various researchers. These may fall into one or more of the wide range of options mentioned above. The BOOT and BOT are said to be very popular in Europe (Li, 2003). A summary of this range of options have been provided and summarised below.

2.3.1 Long – term Concessions

According to Fall et al. (2009), these involve the transfer of all the technical, operational, commercial and financing risks and responsibilities to the private operator. In other words, the operator is responsible for all capital investments whereas the public sector is responsible for establishing performance standards and ensuring that the concessionaire meets them (ADB, 2008). They are long-term in that they normally take 20 – 30 years of operations. Fall et al. (2009) reports that while long – term concessions contracts with international water companies have been the dominant PPP Model in Latin America and East Asia, they have been implemented in Western and Central African only in three countries namely, Mali, Gabon and Cape Verde. Given the prevailing country risks and high poverty rates, this approach was considered not to be financially viable and too risky for the region. It is indeed said that the longer the period the higher the risk considering that the future is uncertain.

Similarly, higher risk ventures are associated with higher returns. The long-time nature of concessions entails that the private sector who are the financiers would like to recoup the huge capital pumped into the arrangement and realise a reasonable return out of it. Concession contracts can also take the form of “user pays” type, meaning that the user of a facility pays directly for the use of that facility (ACCA, 2012). This arrangement is most commonly known as a concession or Build, Operate, Own and Transfer (BOOT) project (ACCA, 2012; Al-Shqairat, 2009).

In terms of strengths, concessions are an effective way of attracting private finance required to fund new construction or rehabilitating existing facilities. In other words, the concession arrangement provides incentives to the operator to achieved improved levels of efficiency and effectiveness considering that gains in efficiency translates into increased profits and returns to the concessionaire. Nonetheless, a concession provides complexity of the contract required to define the operator’s activities. The need for Government to improve on its regulatory capacity in relation to tariffs and performance monitoring. Due to the nature of the contract, the bidding process and contract design is complex. They can also be politically controversial and difficult to organise (ADB, 2008).

2.3.2 Affermages (Lease) Contracts

According to Fall et al. (2009), this involves giving a private operator responsibility by a public granting authority (Government or Asset-Holding Company (AHC)) to operate and maintain assets and provide services to customers, including billing and collection. Other than new and replacement investments, which remain the responsibility of the public authority, the operator provides a service at his expense and risk. Responsibility for service provision is transferred from the public sector to the private sector and the financial risk for operation and maintenance is borne entirely by the private sector operator (ADB, 2008). They normally take 10 -15 years of operations and the risk involved is considered to be medium. Ownership remains with the public sector. This is said to have been successfully implemented in Côte d’Ivoire, Niger and Senegal and extended to Cameroon. Affermages are said to be preferred PPP options in France since mid-1940s. Nonetheless, they are prominent in water supply in Western and Central African as compared to other developing regions.

According to ADB (2008) handbook, the key advantage for this option is that it provides incentives for the operator to achieve higher levels of efficiency and higher sales. Nonetheless, tariff adjustment could be very sensitive and complex considering the contractor derives the payments from the revenue collected from customers. Similarly, the responsibility for capital investment remains with the Government and no private investment capital is mobilised thus reducing government's investment in other sectors of the economy.

2.3.3 Management Contracts

These are considered as a first step towards implementation of long-term PPPs. A good example was that of Gabon and Mali using management contracts first before going into concession contracts. Another management contract that was implemented and said to be so successful was that of Johannesburg water in South Africa (World Bank, 2010). They are normally of short duration ranging from 3-5 years of operations or a transitional arrangement with a limited transfer of responsibilities and risks to the private operator (Fall et al., 2009). Both the private sector risk and financial and commercial risks remain relatively low and ownership remains with the public sector. Although the ultimate obligation for service provision remains in the public sector, daily management control and authority is assigned to the private partner or contractor. The public authority remains in charge of financing and implementing investment in rehabilitation and systems expansion whereas the private sector normally provides working capital (ADB, 2008).

According to the ADB (2008) handbook, the management contract advantages are in form of operational gains that result from the private sector management without actually transferring assets to the private sector. They are less difficult to develop and less controversial and less costly in terms of fewer staff from the private sector being part of the arrangement. In terms of weaknesses, the split between the obligation of services and management on one hand, and the financing of expansion planning could inhibit the private sector from enjoying the autonomy or the authority thus not able to make meaningful change. Similarly, being paid a portion of profits may encourage the private sector to inflate the reported achievement or deficit maintenance of the system to increase profits.

2.3.4 Performance – Based Service Contracts

This involves a private operator being given a performance based contract focusing on commercial and financial management and must perform according to the agreed cost and must typically meet the performance standards set by the public sector (Fall et al., 2009; ADB, 2008). According to ADB (2008), a predetermined fee is paid to a private partner for the service which may be based on a one-time fee, unit cost, or other basis. This means that the contractor's profit increases if it can reduce its operational costs while meeting required service standards. The government is responsible for funding any capital investments required to expand or improve the system. This happens when the government is reluctant to transfer public water supply utilities to the private operator but instead engages it in a performance based contract. However, a clear defining of output and products expected from the private operator is critical in ensuring achieving of results. The private sector risk and financial and commercial risks remain relatively low. As a case example, and according to ADB (2008) handbook, Malaysia experienced a service contract for a period of 30 days for water leak reduction in the state of Sabah that had the highest levels of non-revenue water (NRW). The service contract was undertaken by Halcrow Water Services in partnership with a Malaysian company, Salcon Engineering, and the project's performance was good and successfully ended.

In terms of strength, service contracts are usually most suitable where the service can be clearly defined in the contract, the level of demand is reasonably certain and performance can be monitored easily. It provides a relatively low-risk option, has a quick and substantial impact on system operations and efficiency and provides a vehicle for technology transfer and development of managerial capacity. However, it is not suitable if the main objective is to attract capital investment. Effectiveness may be compromised if other sources of financing do not materialise. Political vulnerability may be experienced considering that the public sector remains in charge of tariff setting and assets making it difficult to sustain the system (ADB, 2008).

Similar types of PPP arrangements have been cited by McDonald & Ruiters (2005) though termed as forms of water services "privatisation", i.e. service and management contracts, lease or affermage, concession and BOOT contracts. Nonetheless, community/NGO

provision, has been included as another form of water service and involves the transfer of some or all of the responsibility for water provision to the end user or a not-for-profit intermediary body in areas such as digging wells, laying or repairing pipes.

However, and according to SADC (2007), the adoption of any PPP Model may depend on various options or arrangement between parties involved (Table 2.11 refers).

Table 2.11: PPP Models based on options/arrangements

Option	Service contract	Management contract	Lease contract (Affermages)	Concession
Ownership	Public sector	Public sector	Public sector	Could be either
Financing of investment	Public sector	Public sector	Both	Private sector
Financing of operations and maintenance	Public sector	Public sector	Private sector	Private sector
Private sector risk profile	Low	Low	Medium	High
Financial & commercial risk	Low	Low	Medium	High
Duration (yrs.)	1 -2	3 – 5	5 – 10	20 – 30
Responsibility for setting tariffs	Public sector/ Regulator	Public sector/ Regulator	Private sector/ Regulator	Private sector/ Regulator
Method of payment	Unit price	Cost + Bonus	Portion of tariff	Tariff
Objective of private sector participation	Operating efficiency	Operating efficiency	Operating efficiency + capital	Mobilise private capital

Source: SADC BA Public Private Partnership Capacity Building Programme: 14 – 16 March 2007, Lusaka, Zambia.

In certain cases, some PPP Models have not performed well. The arrangements in Western and Central Africa are a case example (Fall et al., 2009) with a mixture of successes and failures. It could also be true that what has worked well in one environment may not work well in another and vice versa. Their suitability and effectiveness need to be proven using various measures. Traditionally, PPP schemes have been applied to infrastructure and service provision such as electricity, telecommunications, water, transport, and solid waste

sectors and increasingly in the social and information technology sectors. There are also other arrangements that may be considered to be PPPs but not in real sense or in the context PPP Models are looked at. However, they differ in purpose, service scope, legal structure and risk sharing. For instance, risk levels in Rehabilitate, Improve, Maintain, Operate and Transfer (RIMOT) projects are lower than Greenfield BOT projects (Thillai et al., 2010) and indicate that even in areas like renovation and maintenance, PPP structures can bring many advantages over traditional procurement. Similarly, the choice of the PPPs arrangements depend on government's policy in the related sector and on potential value for money to be generated (Government of the Republic of Zambia, 2009). Nonetheless, and according to ADB (2008), selecting a PPP option is based on the diagnostic of the following:

- (a) PPP options available;
- (b) Technical constraints and goals of the sector;
- (c) Legal and regulatory constraints
- (d) Institutional issues
- (e) Commercial, financial and financing requirements;
- (f) Interest of the market;
- (g) Special requirements of the sector based on characteristics of the system or population.

Priorities for a PPP might include improved coverage; improved services; efficiency improvement with associated reduction in government subsidy or customer satisfaction; and ultimately, the government may use a cost-benefit analysis method or financial modelling.

2.3.5 Summary Conclusion

It is discernable from the aforesaid that there are a number of PPP Models/schemes that are used in various sectors including water and sanitation. What matters is the model, form or type of undertaking preferred to be used in a particular context and based on the benefits that are likely to arise from the arrangement. However, though existing PPP models have been implemented in many countries across the global world, they have not been implemented to the same extent in the Zambian Water and Sanitation Sector. Notably, some selected existing PPP Models have been implemented and continue to be implemented in sectors such as

energy, transport, construction etc. This calls for some formal PPP arrangement aimed at boosting the Zambian Water and Sanitation Sector.

2.4 Structuring a PPP, PPP Models Implementation and Performance

A PPP Model implementation and performance is likely to depend more on how a PPP is structured in the first place. As noted in paragraph 2.3 above, PPPs can be structured and contracted in various forms. The need to structure them properly by carrying out stringent sector diagnostic and road map is key. PPP Models also come in different forms and can differ from country to country or between projects. Their context, purpose and perspective may as well differ depending on the arrangement between parties involved and the pattern of implementation is likely to follow the arrangement. For instance, lease and concession contracts are longer in duration as compared to management and service contracts. The thrust may also follow the contract performance parameters embedded in the contract agreement and ultimate benefits likely to arise. These could include arrangements such as BOOT, BOT, DBOT, BTO etc. (Mouraviev & Kankadse, 2012; Fall et al., 2009; Ghobadian et al., 2004; Li, 2003; ONG, 2003). To a larger extent, there seem to be a lot of commonalities into their implementation nature (for PPPs using the same model) in line with the reasons adduced for going into PPPs (Paragraph 2.2.6 above refers) and quite a number of performance parameters being used to assessing the successes or failures of PPPs.

According to the ADB (2008) handbook, PPPs incorporate three key characteristics: namely, a contractual agreement defining the roles and responsibilities of the parties; sensible risk – sharing among the public and the private sector parties; and financial rewards to the private party commensurate with the achievement of pre-specified outputs. A successful PPP is designed with careful attention to the context or the enabling environment within which the partnership will be implemented and can also be reformed or PPP to be accommodated within existing conditions (ADB, 2008). The ADB handbook also notes that in designing a PPP process and selecting a form of PPP, it is important to consider reform objectives, policy environment, legal, regulatory and institutional frameworks, financing requirements and resources of the sector, political constraints and stakeholders concerns.

2.4.1 Structuring a Public – Private Partnership (PPP)

According to the ADB (2008) handbook, and as part of structuring a PPP, it is critical that a PPP is built upon a sector diagnostic that provides a realistic assessment of the current sector constraints. These include:

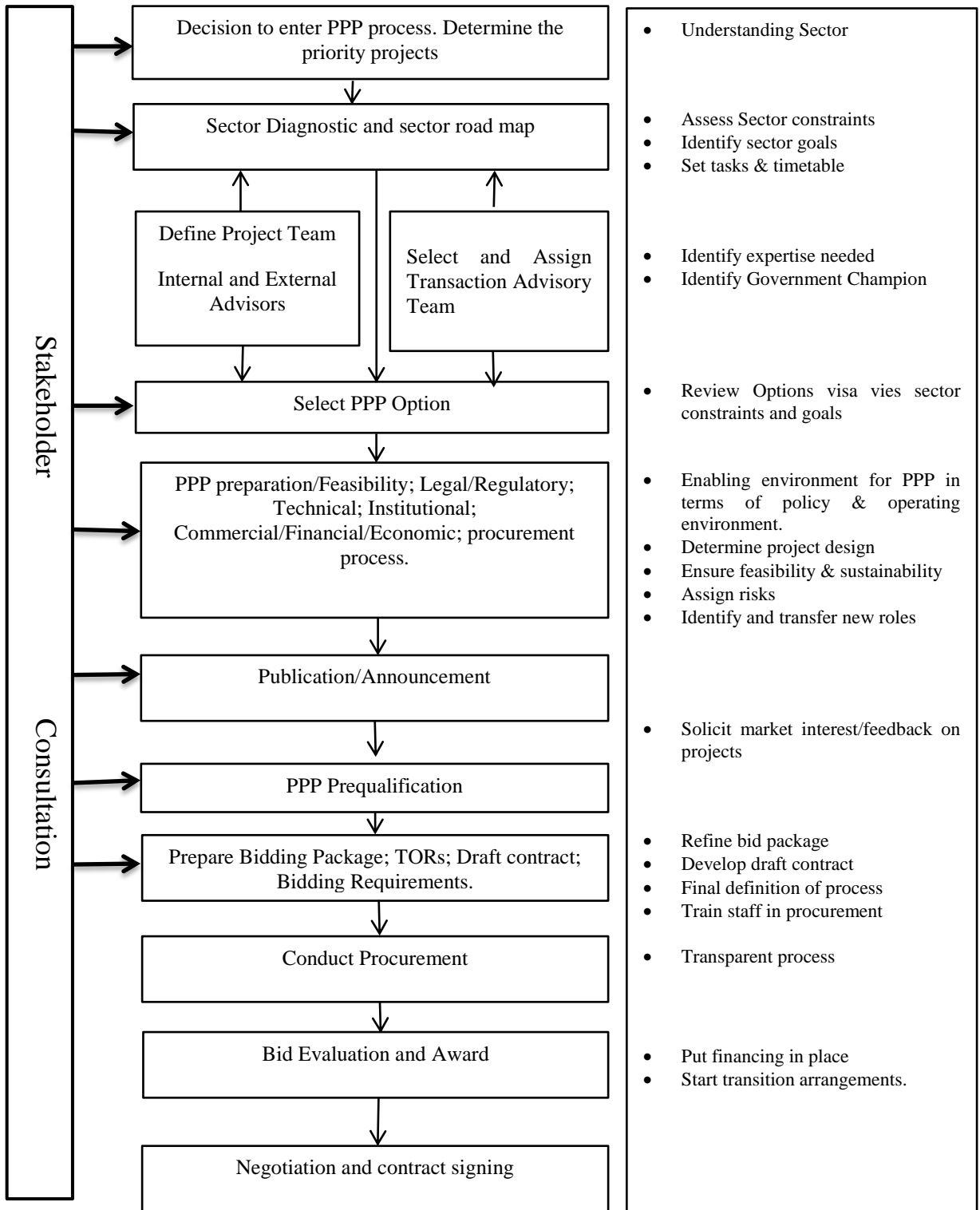
- (a) **Technical issues** –government should assess the current technical constraints in the sector to be reformed, including systems efficiency, utility operations and responsiveness to customers. There is need for instance to know the level of underinvestment, poor investment planning, maintenance, ineffective management and lack of operational expertise. The need to catalogue investment under way and investments planned as well as existing assets in a cost effective manner is inevitable. In other words, the technical capacity gaps are established to merit additional capacity through a PPP contractual arrangement.
- (b) **Legal, regulatory and policy frameworks** – the need to reform the regulatory regime may arise and/or to create regulatory bodies to facilitate a shift from purely government provided services to the private provision of services. In other words, an enabling legal, regulatory and policy environments that supports private sector investment in critical services is critical to a sustainable PPP. These are likely to minimise the likelihood of corruption and sufficiently encourage private participation and investment. There is need to create confidence that the laws and the contracts arising from a PPP to be undertaken will be respected and can be enforced in the courts or through arbitration, if necessary.
- (c) **Institutional and capacity status** – there must be adequate institutional and legislative frameworks in place to support sector improvements and PPP in particular. There is need to ensure that impediments that may relate to issues of autonomy, accountability, cultural aspects, staff development and skills levels are minimised. A champion to lead and drive the reform agenda forward should be in place. In other words, the uncertainty in terms of institutional and capacity status should be minimal for private participation.

- (d) **Commercial, financial and economic status** – such as improvements in the billing systems, customer databases, the status of receivables and funding arrangements. There is need to design a detailed and realistic pricing strategies in order to ensure that affordable services are provided, encourage use while providing the private partner with revenue sufficient for commercially viable options. A financial model may be inevitable to assist in reviewing, for instance, the available data, identify key points of sensitivity and continually challenge and update critical assumptions and results.

Additionally, there is need to set clearly a sector strategy and road map and government commitment and a designated champion coupled with sufficient stakeholders' consultation. The ADB (2008) handbook provides a case example of Manila water in the Philippines on how transparency was promoted in order to build support for introducing Private participation in infrastructure (PPI) in water and waste water services in Metro Manila. As a result of a comprehensive strategic communication programme that included among its objectives the promotion of transparency in the PPI transaction, and in particular, by putting up a transparent public procurement process and the perception that the stakeholder developed, the project was successful.

The sector diagnostic is therefore key in structuring and contract formation of a PPP and leads to the development of a road map and sequence of PPP activities, which describes the components of the sector diagnostic. The ADB (2008) handbook notes a generic PPP Project sequence as provided in Figure 2.2 below.

Figure 2.2: Generic PPP Project Sequence



Source: Heather Skilling (2007).

2.4.2 PPP Models Implementation.

According to Fall et al. (2009), a wider range of PPPs schemes have been implemented in Western and Central Africa in form of long-term concessions, medium-term affermages, short-term management and service contracts. This is contrary to other parts of the developing world where water PPPs tended to focus on one main model say concessions. Various other PPP Models have been implemented in Europe, Asia, and America (Paragraph 2.2 on PPP concept refers). From the Western and Central African perspective, the implementation of PPPs in combined power/water utilities have faced more problems in that revenue from power operations could not subsidise water operations due to either rising fuel cost, inadequate power plants, or difficulties with regulation. According to Fall et al. (2009), and based on lessons learned from PPPs in urban water supply in Western and Central Africa, successful PPPs implementation would require the following:

- The need for a challenging environment with no room for mistakes by paying more attention to preparation and implementation.
- Affermages appears to be a well-adapted PPP Model in the region due to its remarkable benefits.
- Successful PPPs require the involvement of the local partners to inculcate the required interest and ownership.
- Successful partnership require well-designed sector reforms such as unbundling the key functions of policy formulation, regulation, financing, asset ownership, service provision and establishing contractual relationships between public and private partners (Fall et al., 2009). This is similar to Zhang & Jia, who assert that successful implementation of PPPs depends to a larger extent on the development of sound legal procedures, agreements and contracts that clearly defines the relationship between the two parties (Zhang & Jia, 2009). Similarly, without thoughtful and professional legal frameworks and contracts, disputes are likely to occur (Institute for Public-Private Partnerships (IP3), 2000b cited in Zhang and Jia, 2009).

Fall et al. (2009) further note the following:

“A flexible and resilient regional PPP Model seems to have emerged during the last ten years based on affermages contracts, which combine private operation of the service with public financing for developing the infrastructure and sharing the commercial risk between private and public partners. To apply this or any PPP Model successfully depends as much on the contribution of Government as on the efforts of the private partner. PPPs have succeeded where Governments have been fully committed to reforming their urban water supply sectors, in particular with regards to full recovery of O&M and capital costs from user charges, elimination of interference in the management of companies involved in infrastructure development and service provision, extension of access to modest-income households, and payment of the water bills of public agencies. PPPs have worked better where operators have had strong contractual incentives for increasing efficiency. Finally, an important element of success has been the adequacy of a dispute resolution mechanism, and the willingness of all parties to use it effectively”.

In order to minimise implementation failures as a result of not using key success factors alluded to above, the Government of the Republic of Zambia has strengthened its position by developing various institutional, policies and legal frameworks (National Water Policy 1994 and 2010, Water Supply and Sanitation Act, 1997; Water Resources Management Act, 2011; PPP Policy and the Act, 2009) to support the efficient and effective implementation of the various projects to be initiated such as PPPs. This has beefed up the Water Act, 1949 that was not elaborate and sufficient enough to deal with water supply and management. As to whether the institutional and legal framework currently in place is sufficient to merit the initiation and implementation of PPPs in the sector or not is a matter of opinion. Nonetheless and based on the experiences from Western and Central Africa, Fall et al. (2009) argue that given the scarcity of qualified professionals and character of the local political economy, the establishment of an “independent” or even an “autonomous” regulatory agency has arguably added little value to the PPPs. This still need to be proven beyond double through research interventions. The development of a conceptual model may assist in addressing these assertions.

2.4.3 PPP Models Performance

While different PPP Models have been used, their performances have varied based on the arrangement and performance measurements used. Similarly, and while PPPs have often

been credited with outstanding success, it has also been strongly contested with a number of short comings (Ghobadian et al., 2004, p. 221). Successes and failures are depended on a number of factors or measures such as those highlighted in paragraph 2.4.1 above. For instance, the performance of PPPs in Western and Central Africa was described as a mixture of successes and failures in relation to access to piped water, reliability, financial sustainability, environmental sustainability, affordability, and financing of the water supply infrastructure (Fall et al., 2009).

In describing the impact of PPPs on urban water supply services in Western and Central Africa, Fall et al. (2009) note that:

“Successful PPPs in Western and Central Africa have good track records in improving the quality and the reliability of the water service and in extending direct access to piped water to households. Successful PPPs have also helped achieve financial sustainability of the water supply service by generating sufficient revenues from user charges to fully cover operation and maintenance costs, service the debt and contribute cash to capital expenditure programs. Finally, well designed PPPs have succeeded in making water supply service more affordable to low-income households”.

In the eleven case studies conducted by Fall et al. (2009), comprehensive data from UNICEF/WHO coverage data was used to give a general picture of the performance of PPPs for helping achieve the Millennium Development Goals (MDGs). The impact assessment on access to piped water supply was particularly based on parameters of coverage and connection ratios in relation to improved sources of water and piped water through household connections. While there are still some challenges for water utilities to meet exploding demand, strides are being made to meet the MDGs. Based on 23 countries in Western and Central Africa, and 1990 as a base year, it is reported that both coverage and connection ratios have improved towards the MDGs targets though those for Nigeria have dropped possibly due to increased population (Table 2.12 refers)

Table 2.12 : Coverage and connection ratios in Western and Central Africa.

	1990			2004			MDG 2015 Targets		MDG 2004 Interim Targets	
	Urban Pop. Mio.	Cov. Ratio %	Conn. Ratio %	Urban Pop. %	Cov. Ratio %	Conn. Ratio %	Cov. Ratio %	Conn. Ratio %	Cov. Ratio %	Conn. Ratio %
22 Countries	36.1	72	30	65.3	83	40	86	65	80	49
Nigeria	31.7	80	32	61.8	67	15	90	66	86	51
Total	67.8	76	31	127.1	75	28	88	65	82	50

Source: Authors' calculations based on UNICEF/WHO coverage data

Notes: Cov. Ratio: Coverage ratio, i.e. the proportion of urban population with access to piped water (whether through connections, standpipes, or neighbours' connections); Conn. Ratio, i.e. the proportion of urban population with direct access to piped water through residential connections; mio: millions.

Additional data also indicate that the few countries where PPP has been in place for several years and is still on-going are outperforming those that remained under public management though some are trailing behind the targets (Table 2.13 refers)

Table 2.13: Summary findings of countries with PPPs on track to Achieving the MDG.

	1990			2004			MDG 2015 Targets		MDG 2004 Interim Targets	
	Urban Pop. Mio.	Cov. Ratio %	Conn. Ratio %	Urban Pop. %	Cov. Ratio %	Conn. Ratio %	Cov. Ratio %	Conn. Ratio %	Cov. Ratio %	Conn. Ratio %
LS on-going PPP	11.7	74	41	20.6	90	56	81	57	87	70
Recent PPP	10.3	82	34	18.3	87	46	87	52	91	67
LS Term. PPP	2.7	74	20	5.0	83	22	81	42	87	60
SL Term. PPP	4.1	49	10	7.7	68	23	63	35	74	55
Public Mgt.	7.3	66	20	13.7	75	26	75	43	83	60
Nigeria	31.7	80	32	61.8	67	15	86	51	90	66

Source: Data for 1990 and 2004 are provided by the UNICEF/WHO MDG Joint Monitoring Program; MDG target estimates for 2004 and 2015 have been made by the authors.

Notes: The table shows the aggregated performance of the various country categories with regards to household connections and access to improved water sources, weighting each country by its population. LS – Long standing; SL – short lived.

Darker blue shading highlights indicators that are on track.

Grey shading highlights indicators that are not on track.

While the above analysis was merely centred on access to piped water supply infrastructure, achieving reliability, sustainability and affordability of service were considered as critical pedagogical factors in achieving MDGs and as they relate to PPPs. The report highlights the following findings based on PPPs and reliability, sustainability and affordability.

- (a) That successful PPPs have been able to reduce water rationing and even re-establish continuous service of 24/7 basis in some cases and that in a few countries, mostly those in which successful PPPs have been implemented, tap water is safe to drink. A certain level of reliability has been achieved.
- (b) That operational efficiency is essential for financial sustainability and that successful PPPs have reduced water losses attributed to non-revenue water (NRW) especially in Gabon and Senegal where a level of water losses comparable to the best run utilities in Europe and North America have been achieved. Other countries such as Côte d'Ivoire, and Mali have achieved visible progress. Successful PPPs have also achieved improved labour productivity without large scale staff layoff and made large contributions through capacity building and local staff development. Successful PPPs have improved collection of water bills in countries such as Côte d'Ivoire, Senegal, Niger, Burkina Faso and Gabon with noticeable high collection ratios.
- (c) Successful PPPs have helped improve water resource management though they have had no visible impact on the protection of water resources against pollution.
- (d) In countries with successful PPPs, water tariffs have usually declined in constant terms though comparing water tariffs among countries was considered difficult due to physical circumstances such as customer bases, average consumption and financing conditions. It is also noted that efforts to improve affordability may not always reach the very poor.

In a related report by Marin (2009), a review of experiences in developing countries was done on PPPs for urban water utilities based on performance data from more than 65 large water PPP projects (concessions, lease-affermages and management contracts) that have been in place for at least 5 years. He notes:

“PPP projects in the water sector have been controversial, particularly after a series of highly publicised contract terminations in recent years raised doubts about the suitability of the approach for developing countries. Lack of data on population and quality of services provided has made it difficult to assess the overall contribution of PPP projects in developing countries”.

Nonetheless, his key findings were that water PPPs are a viable option in developing countries. The performance analysis of four performance dimensions of access (increased coverage expansion), quality service (reduced water rationing), operational efficiency (reduced water losses, improved bills collections and labour productivity) and tariff levels suggest that the overall performance of water PPP projects has been generally quite satisfactory despite limitations relating to data accessibility, reliability and the ambiguity of indicators. He further concludes that the most consistent contribution of private operators has been improved efficiency especially as it relates to concessions and lease – affermage contracts and that contractual arrangement for water PPPs have evolved differently in different regions.

It is evident from Marin's (2009) report that assessing performance of existing PPP Models still remains controversial despite the various dimensions that have been used by many researchers though notable performance indicators have been observed. What emerged from Marin's (2009) examination of empirical evidence was that well-designed partnerships between the public and the private sectors are a valid option to turn around poorly performing water utilities in developing countries. He further indicates that in the challenging environment of many countries, the main focus of water PPPs should not be about attracting direct private investment, but rather about using private operators to improve service quality and efficiency. This is also reason enough why this researcher attempt to add additional dimensions to the debate on PPPs performance based on cost, time and quality effectiveness.

Further literature on PPPs suggests a number of facets or antecedents that have been used in assessing PPP Models performance. Notable are those that have been used to measure Value for Money (VFM) (Cheung et al., 2009a; Zou et al., 2008; Nisar, 2007; Pitt and Collins, 2006) and other related performance/success factors (Jacobson & Choi, 2008; Jamali, 2007; Trafford & Proctor, 2006) that have been empirically or phenomenologically tested in various PPP Models. In particular, Cheung et al., (2009a) in their research to study measures that enhance VFM in a PPP project based on antecedents of efficient risk allocation, output-based specification; competitive tender; private management skills; and private sector technical innovation found that the first and second VFM measures ranked by respondents from Hong Kong were also ranked first and second by Australia and UK respondents. Nisar

(2007) research on VFM drivers in PPP schemes found that efficiency gains and clear benefit of risk transfer need to be obtained. This position was also agreed by Cheung et al. (2009a). From the three case studies of PPP construction projects taken in UK, Nisar found that the majority of PFI central government projects were delivered on time and at the agreed price to the public sector though not possible to judge whether these project could have achieved these results using a different procurement route. Nonetheless, Nisar acknowledges the difficulty in making comparison of cost and quality before and after PFI implementation and the difficulty in developing measures for individual case studies especially for quality measures. Ke et al. (2011), Fischer et al. (2010), Zou et al. (2008), Li (2003), and Shakeri (2002) focus is more on risk assessment and integrated management. Others such as Pitt and Collins (2006) research was about PFI and VFM and found that PFI is still perceived as the most cost effective means of procuring public infrastructure by Government. The positive aspects of PFI are competition generated and risk management. Jamali (2007) research was about gauging service quality output in relation to customer satisfaction and suggested a good level of satisfaction. Trafford and Proctor (2006) examined important characteristics that go hand-in-hand with successful PPPs and argued that good communication, openness, effective planning, ethos and direction contribute to the success of a joint venture. Jacobson & Choi (2008) used ten success factors to analyse and compare principal factors that contribute to successful PPPs and public works projects. These included specific plan/vision, commitment, open communication and trust, willingness to compromise/collaborate, respect, community outreach, political support, expert advice and review, risk awareness, and clear roles and responsibilities. The findings were that high degree of commitment and shared vision between clients, architect and contractors were shown to be important aspects as well as pairing factors of open communication and trust with higher levels of compromise or collaboration.

In a process model developed by Fischer et al. (2010), key risks identified were not evaluated though Ke et al. (2010) evaluated them using China's PPP projects. This indicates that risks form an integral part of PPP performance but needs to be minimised and maximise the overall project performance. Suffice to say that PPP rewards should include factors that enable overall performance of the undertaking (Cheung et al., 2009a; Jamali, 2007). It is also true that scope, time, cost and quality management resonate well with risk factors and form

part of the critical project management knowledge areas (Schwalbe, 2009). Like accessibility, reliability and financial viability, they can increase the effectiveness of the PPP Models.

Ahadzi (2004) investigated the extent of bidding time and cost overrun from the pre-contract point of view but less emphasis on quality factor. He acknowledged that pre-contract time and bidding cost overrun are generally high in PPP projects. Ahadzi (Op.cit) focus was more on time spent before the contract is signed and cost involved in bidding and did not assess performance as it relates to actual PPP implementation. This researcher's proposition is more on determining the cost, time and quality effectiveness of PPP Model if implemented in the sector in question.

Gunnigan (2007) research was set to find out a means by which effectiveness of PPPs could be increased. He found and validated three propositions namely risk, value and specific elements of participant attitudes and used them in developing a conceptual model to assist PPPs practitioners in future. Fall et al. (2009) acknowledges that financing, private operator involvement, pursuing a cost recovery policy and regulation by contract factors should be considered when replicating PPPs.

ONG (2003) acknowledges that PPPs are complex and time consuming and involves significant expenditure. Nonetheless, he acknowledges two principal arguments in supporting PPPs. Firstly, the utilisation of private sector expertise, skills and capital resources which he said could achieve best value for money in the delivery of public services, which can be reflected in terms of improved quality of service, high efficiency and lower costs. Secondly, partnerships allow Government to reconcile capital investment by reducing capital expenditure. He summarises by saying that the main conditions for successful implementation of privately financed infrastructure projects include:

- Economic stability of the host country.
- Strong political will and commitment
- Well established local stock and capital markets
- Equity and clear legal system
- Willingness to trust and ability to communicate

- Careful selection of right partners
- Common goals and objectives
- Proper allocation of risks and incentives
- Suitability of privately financed projects
- Learning from project lessons
- Provision of training.

Nonetheless, ONG (Op.cit) concludes that a successful partnership depends largely on the nature of the project, the commitment of the partners involved, the ability to communicate and a willingness to trust. Mutual commitment towards the project from all parties is a key factor for a successful project. Parties need to ensure that by and large, key success factors are identified and work towards achieving them or else the partnership is not likely to succeed.

The need to determine the effectiveness of PPP Models in the delivery of public service in the Zambian Water and Sanitation Sector using additional dimensions cannot therefore be over-emphasised. There seem to be very few studies if not none that have investigated PPPs effectiveness using a combination of cost, time and quality measures in their entirety especially as they relate to quantitative measures. Nonetheless, the researcher intends to use this combination (cost, time and quality factors), to show if existing PPP Models can be used effectively in the development of the Zambian Water and Sanitation Sector. According to Nisar (2007), more emphasis on strategies for the transfer of risk, VFM drivers and project expertise is needed for successful conclusion of PPP contracts. Cost, time and quality factors fall within these categories but they need to be investigated thoroughly and in totality as independent factors.

2.5 Review of the Asset Holding Company (AHC) Water and Sanitation Management Contract Performance in Zambia.

The AHC was formed as a result of the privatisation of the Zambia Consolidated Copper Mines (ZCCM). When the mining companies who were negotiating with the Government came through, they did indicate that they would only concentrate on copper mining and not on other peripheral activities such as water and sanitation provision to the townships. At that

stage, Government had two Options namely, to handover the aspect of water and sanitation in the townships to the council and/or look for an alternative vehicle to take care of the water and sanitation. In relation to Option 1, Government realised that councils were also undergoing some form of transformation in the manner water and sanitation were to be provided to the communities. For instance, councils had started spinning off their water and sanitation services by forming water utility companies. The formation of AHC was therefore as a result of the unwillingness by the prospective mining companies to take over the Water Supply and Sanitation that was not considered core. Government therefore decided to form the AHC municipal services to take over the running of water, sanitation and solid waste management. Unlike the water utilities that were formed to deal with water and sanitation, AHC had additional responsibility of dealing with solid waste management.

AHC was basically set up to hold assets in trust of Government until a more permanent solution was found on who should run the water, sanitation and solid waste. This was aimed at ensuring that the available infrastructure was not further deteriorated.

In terms of operations, AHC brought in a commercial angle to ensure commercial viability. The AHC engaged a management contractor by the name of Saul International from France to manage the water, sanitation and solid waste for a period of 4 years and later extended for another 9 months. The engagement was done through competitive bidding and involved companies from South Africa, Germany, France, UK, and Australia.

AHC through the management contract was formed in order to sustain the provision of water and sanitation services until such a time when a permanent strategy was found. The company brought in the commercial angle, improved operational and IT systems. The management contractor was able to enhance skills. The operator was also sensitive to third world country's needs of ensuring that social aspects were taken into account and were therefore sensitive to issues of tariffs. Due to the fact that all the risks were assumed by AHC, the tariffs were structured in a manner that did not contravene the social aspect of the communities. When the contract expired, Nkana Water and Sewerage Company took over the operations in the interim, though later on the operations were decentralised to other towns with the Copperbelt province.

From the management contractor's perspective, the cost effectiveness aspect was not so much on the agenda as the contractor's role was basically to implement various activity as provided for in the plan and did not therefore assumed much risk. The contractor did not bring in private capital and/or operate as a private entity in order for them to bother much about operational and/or profitability risk and eventually to warrant the aspect of cost effectiveness. Their role was simply to execute and manage the various activities which were entirely funded by government and to be paid a management fee of US\$ 5 million out of a total programme cost of US\$ 35 million. Out of the total contract cost, US\$ 19 million was spent on infrastructure and was not enough to do projects in other towns such Luanshya, Kitwe, Chingola, Mufurila, and Ndola. Equally, the aspect of time effectiveness was not very much pronounced, again based on the premise that the risk component was not much on the contractor's side. Based on the information on the ground, AHC operations was said to be successful especially in building human resources skills and operational systems. Some failures were also recorded especially those associated with insufficient funding. Nonetheless, there were enough lessons drawn from AHC operations that could merit the repeat of the same model with some improvement.

2.6 PPP Models Applied to Water and Sanitation Sector in Developed and Developing Countries

Various PPP Models have been applied to the water and sanitation in developing countries (Bpdws, 2011; Partnershipsforwater, 2011; Gia & Fugelsness, 2010; Fall et al., 2009; Martin, 2009). According to Bpdws (Op.cit), improving partnership governance in water services is dependent on a number of governance dimensions. For instance, "power-balanced partnerships" and "shared incentives" are necessary for ensuring a PPP's viability whereas "customer focus and results orientation" are necessary for ensuring a PPP's effectiveness. Others include water resource protection; accountability and transparency; poverty responsiveness and sound financing mechanism and proactive risk management are found to significantly affect the viability of water and sanitation services in developing countries.

Considerably, a wider scale focuses more on infrastructure and service delivery (Thillai, 2010; Fall et al., 2009; Hajjah Dayang Suzana, 2009; Hannah, 2008; Ahadzi, 2004; ONG, 2003; Shakeri, 2002) and assessing performance using various factors (BPD, 2011; Ke et al.,

2011; Fischer et al., 2010; Cheung et al., 2009a; Cheung et al., 2009b; Hay, 2009; ADB, 2008; Jacobson & Choi, 2008; Sciulli, 2008; Guunigan, 2007; Jamali, 2007; Nisar, 2007; Efficiency Unit, 2006 cited in Cheung et al., 2009; Trafford & Proctor, 2006; Li, 2003 etc.). There is also evidence of numerous researches and articles that have been done in the water sector alone without PPPs (Hajjah Dayang Suzana, 2009; Al-Mohanndi, 2007; Baggett, 2007; Madema, 2008; Sallah-Philips, 2006; Husain, 2000; Akosa, 1990). These border more on issues of policy, implementation guidelines and experiences a view supported by the Institute for Public-Private Partnerships (IP3) (2000b cited in Zhang and Jia 2009). However, the application of PPPs Models to different sectors may differ in context, purpose and perspective. For instance, those in the water and sanitation sector may focus more on issues to do with accessibility, sustainability, affordability and quality aspects among others and those in infrastructure development may generally focus on enhancing service provision and delivery. Nevertheless, the motive behind the arrangement (between the public and private sector) may border on a number of factors such as value for money and risk responsibilities. Various ways of applying PPP Models in different environments need to be considered.

Preliminary results indicate that though similarities have been noted in PPPs arrangements across the global world, there are a number of variations in the manner PPPs have been applied and implemented. This has led to individuals and institutions tasked to evaluating their performance experience some difficulties mainly due to lack of sufficient comparable data. Performance measurement as it relates to how effective existing PPP Models have been, especially in relations to cost, time and quality factors still remain a challenge to a larger extent. However, a number of factors have been researched on and evaluated.

2.7 Application and Relevance to the Zambian Case

Based on the knowledge and experience derived from the above developed and developing countries on PPPs and considering that there are a lot of similarities in the manner PPPs are conceived and implemented, though the thrust may differ, Zambia could just be on the right path to using the concept of PPP to improving effectiveness in the delivery of public service, particularly as it relates to the provision of water and sanitation. As allude to above, a PPP is not a new phenomenon. The PPP concept has spread to all parts of the world and is being

implemented using various models if not common. For instance, the London underground which opened in 1863 was a form of long-term concession PPP. Similarly, PPPs/PFI have been done in various sectors such as transport, ICT, water and energy, health, construction to mention but a few. As for Zambia, PPPs have commenced in roads, rails, border post support infrastructure, energy, estate and housing and agriculture and are at various stages of implementation but none in water and sanitation sector a concern to the researcher. There are definite common expectations of PPPs, inter alia, creating jobs and capacity building, bringing in expertise for various aspects of the project cycle and accelerated investment in infrastructure to improve service delivery. These apply to most types of PPP regardless of where it is being implemented. Zambia is not an exception. While certain PPP Models may not suit well in the Zambian environment by virtue of their characteristics, they can easily be adapted in line with the Zambian PPP regulatory, legal and institutional frameworks and various policies and guidelines available.

Where the regulatory, legal and institutional frameworks have gaps that may affect the initiation and implementation of PPPs, there is definitely room for improvement.

2.8 Literature Synthesis

2.8.1 Introduction

This section brings together the conceptual underpinning the PPP concept, PPP Models/schemes, their implementation and performance and applicability of existing PPP Models in the development of the Zambian Water and Sanitation Sector in a bid to synthesise the literature. Currently, there is no formal PPP in the water and sanitation sector thereby informing the research at hand. This is despite many developed and developing countries venturing into PPPs as a strategic option for enhanced public service delivery among others. The focus is more on the use of existing PPP Models for increased effectiveness.

2.8.2 Literature synthesis

The School of Built and Natural Environment (2011) notes that given the changing economic, social and political environment, coupled with globalisation and budget constraints, a PPP has become unavoidable and indeed desirable in many countries worldwide. A number of studies testify to this fact (ACCA, 2012; PartnershipsUK, 2012; Kappeler

& Nemoz, 2010; Fall et al., 2009; Ghobadian et al., 2004; Li, 2003; Partnershipbc, 2003). It is also noted that there has been a move by many developed and developing countries towards increased reliance on PPPs for infrastructure development. This is in a bid to overcome broad public sector constraints in relation to either a lack of public capital and/or public sector capacity, resources and specialised expertise to develop, manage and operate infrastructure assets (School of Built and Natural Environment, 2011). PPPs are now used to accelerate economic growth, development and infrastructure delivery and to achieve quality service delivery and good governance (School of Built and Natural Environment, 2011). This calls for enhanced value for money especially from the effectiveness point of view. Nonetheless, and given that the spectrum of nature and types of PPPs are overwhelming thereby making its definition difficult, it is generally acknowledged that the PPP concept still remain a difficult subject especially on evaluating its performance and is much debated (School of Built and Natural Environment, 2011; Al-Shqairat, 2009; Ghobadian et al., 2004; Li, 2003).

Despite various definitions/meanings attached to a PPP (Mouraviev & Kakabadse, 2012; ADB, 2008; Nisar, 200; Ghobadian et al., 2004; ONG, 2003; Fourie & Burger, 2000) the underlying principle is that, regardless of the undertaking, two or more partners strategically come together based on their perceived mutually exclusive benefits arising from the agreement. This creates some kind of symbiotic relationship between partners. Based on this kind of relationship, each partner derives maximum benefit from the undertaking and believes that the benefits or the value to be derived therefrom is worth much more than the cost of going into partnership. The rights and obligations to economic benefits are likely to flow from either side of the partner by nature of the undertaking and meaning. For instance, in a privatisation (Grimsey and Lewis, 2002 cited in Jamali, 2007; ADB, 2008; Ghobadian et al., 2004; McDonald and Reuters, 2005), the transfer of ownership and/or decision making responsibility to private interests occurs (in part or in total) to non-state actors involved in water delivery; in a PSP, obligations are transferred to the private sector rather than emphasising the opportunity for partnership and corporatisation (ADB, 2008; McDonald and Reuters, 2005). A PSP is considered to be the most popular institutional form of commercialisation in the Southern Africa where water services are ring fenced into standalone 'business Units' owned and operated by the state but run on market principles.

However, Ghobadian et al. (2004) notes that from the Labour Administration point of view, a PPP emphasis is more on the flow of resources and know-how between the public and private sectors for mutual benefits, whereas from Han's (2000) point of view is more on the flow of resources from the private sector to the public sector. As for Fernandez's (1999), the emphasis is more on ownership of assets remaining with the public as opposed to more of cooperation between the public and private sectors. Nonetheless, and according to Ghobadian et al., (2004), PPPs share three key characteristics, i.e. sharing of risks between actors, are long-term relationships, and are construed around a shared aspiration of bringing about a desired public policy outcome. PPPs have also seen a paradigm shift from just engaging the private sector as providers of finances to aspects that enhances value for money such as risk allocation and responsibilities to both parties. However, risk allocation and responsibilities may differ depending on the arrangement and may also hinge on the expected performance levels. According to Mouraviev & Kakabadse (2012), future PPP research in transitional countries such as Russia, particularly in the areas of organisational and power arrangements in partnerships, may delineate new concepts such as government as a guarantor of a PPP project, social significance of a project and risk management in a country's contextual environment. This is likely to add another dimension in the manner PPPs are viewed and perceived world over.

A review of PPPs on a case by case basis across a cross section of countries or geographical location reviewed that in Europe, PPPs/PFIs are used as vehicles to finance public infrastructure (Kappeler & Nemoz, 2010; Li, 2003) and they cut across arrangements that relate to Outsourcing, Concession, Joint public/private ownership and privatisation. As for western and Central African countries, PPPs arrangements range from performance – based service contracts to full concessions (Fall et al., 2009) as opposed to one model. This is similar to the European, American and Asian PPP arrangements and experiences. As for Europe in particular, the strategic focus is more to do with public finance to deal with aspects of social and economic developments. For the Asian countries experiences, the PPP concept hinges on addressing many facets of social and economic challenges ranging from capital additionality to social and economic developments (ACCA, 2012). As for Southern Africa, PPPs are more of a hybrid of those that have been implemented in Europe, Asia or America considering that the region is still undergoing development. Notwithstanding the above drive

and experiences, Western and Central African countries and Europe have been cited as having the longest PPPs implemented so far. Nonetheless, there is no single European or Asian model for PPP although according to Kappeler & Nemoz (2010) and Partnershipbc (2003), the UK has the most PPPs experience of any jurisdiction worldwide and continues to diversify across sectors. While the PPP purpose appears to be common in terms of involvement of private sector and utilisation of its resources in the provision and delivery of public services, PPPs are perceived differently in terms of context and perspective (Cheung et al., 2009b).

In identifying and conceptualising existing models of PPPs commonly used in PPPs arrangements and in a bid to establish their context, purpose and perspective, a cross section of knowledge and ideas on PPPs as captured from various scholars (ACCA, 2012; Mouraviev & Kakabadse, 2012; Ball, 2011; Fall et al., 2009; Nisar, 2007; Ghobadian et al., 2004; Li, 2003; ONG, 2003 etc.) have been established and critically appraised in order to signify the underlying theory on the use of existing PPP Models to increase effectiveness in the Zambian Water and Sanitation Sector. For instance, the reasons/benefits and arguments for and/or against the benefits of PPPs are indeed combinations of both financial and non-financial factors as indicated below.

According to ACCA (2012), PPPs are looked at as a source of capital additionality (raising finances) and public funding capacity. This has also been alluded to by Cheung et al. (2009), ADB (2008) and Ghobadian et al. (2004). It is all about shortage of government funding to deal with infrastructure development and public service delivery. Among other reasons and benefits advanced by many scholars include the need for private incentive, high quality of service required, economic development pressure demanding more facilities, and to address inefficiency (Cheung et al., 2009). Others include it being a strategic partnership tool for reaping mutual benefits (Roumboutsos and Chiara, 2010; Jamali, 2007; Trafford and Proctor, 2006); enable government meet a wider range of policy objectives and aligning risks and responsibilities between the public and private sectors (Ghobadian et al., 2004); tackle challenges such as enhancing public sector performance, high public service cost, absence of required skills in public sector bodies and absence of incentives to reward performance (al-Shqairat, 2009); establish value for money (Cheung et al., 2009a; Zou et al., 2008; Nisar, 2007; Pitt and Collins, 2006; Allen, 2001); need to use PPP as a tool for greater efficiency,

use of available resources in a more effective manner, and need to use PPP as a catalyst for broader sector reform (ADB, 2008). The Partnershipbc (2006) provides seven benefits associated to government and tax payers namely, improved service delivery; improved cost-effectiveness; increased investment in public infrastructure; reduce public sector risks; deliver capital projects faster; improve budget certainty; and make use of assets. As for the private sector, the benefits are to do more with access to secure, long-term investment opportunities. In providing what makes the PPPs attractive or unattractive as a procurement system in UK, Li et al., (2005) list a number of positive and negative factors on page 65. However, and according to Lattemann et al., (2009), reasons may vary from one project to the other and from one country to the other depending on the motive behind taking the PPP route as a strategic option though the common denominator seems to suggest that broadly, the financing and value addition options tend to take the centre stage.

However, the central question in delivering an effective partnership is how to balance social goals with a profit motive as well as how to support innovation whilst still maintaining standards (Moulton and Anheier, 2001 cited in Nisar, 2007; Todd and Ware, 2000). Overall, and whatever the reasons, enhancing public service delivery has become a common thread for PPPs. This has made a PPP to become a popular strategic option globally. Nonetheless, the context, purpose and perspective in which the PPP concept may be perceived could differ depending on where and how it is applied. ACCA (2012) report acknowledges that reasons may differ and depend on the type of PPP in a particular country, across countries and continents. The main driver is said to be the gap that subsist between the demand for infrastructure development and service provision and government's ability to fund these developments. Mouraviev & Kakabadse (2012) also conclude that only the long-run view of PPPs may offer an accurate assessment of their benefits, costs, and externalities. These to a larger extent could determine the underlying reasons, benefits or motives behind PPP.

In looking at the use of existing PPP Models to establish as to whether they could increase effectiveness in the development of the Zambian water and sanitation sector, the literature acknowledges the various PPP Models, how they are structures, implemented and their ultimate performance.

Pidd (2003) defines a model as an external and explicit representation of part of reality as seen by the people who wish to use that model to understand, to change, to manage and to control that part of reality. They are ‘tools for thinking’ or ‘convenient worlds’. The structuring, implementation and their ultimate performance would largely depend on the type of model being used. The literature makes reference to various models ranging from performance based service contracts to full concession (Fall et al., 2009; Locussol et al., 2009; ADB, 2008; McDonald & Ruiters, 2005) that have been used in various sector including water and sanitation and that they can take the form of BOT; BOOT; BTO (Mouraviev & Kakabadse, 2012; Al-Shqairat, 2009; Gunnigan, 2007; Li, 2003; Li, 2003). Nonetheless, the thrust and their performance may differ depending on the agreement between parties. Li (2003) provides a list of UK government recommended PPP Models together with their opportunities and challenges while acknowledging that there are some overlaps with a number of PPP projects fitting into more than one category (Refer to Table 2.12 on page 74). Their adoption would also depend on various options or arrangements (SADC, 2007). However, though existing PPP Models have been implemented in many countries across the global world, they have not been implemented to the same extent in Zambia particularly in the Water and Sanitation Sector. Assessment of their performance still possesses some challenges especially based on quantitative indicators of factor used for measurement than qualitative an aspect requiring further research.

The literature also points to the fact that there is need to structure the PPP Model for the purpose of implementation and performance monitoring and evaluation. Taking into account the models or arrangements highlighted above, there is need to ensure that a contractual agreement defining the roles and responsibilities of the parties is in place; sensible risk – sharing among the public and the private sector parties; and that the financial rewards to the private party commensurate with the achievement of pre-specified outputs (ADB, 2008). According to ADB (2008), a successful PPP is designed with careful attention to the context or the enabling environment within which the partnership will be implemented and can also be reformed or PPP to be accommodated within existing conditions. There is need to consider reform objectives, policy environment, legal, regulatory and institutional frameworks, financing requirements and resources of the sector, political constraints and stakeholders concern (ADB, 2008). A PPP should be built upon a sector diagnosis that

provides a realistic assessment of the current sector constraints such as technical issues; legal, regulatory and policy frameworks; institutional and capacity status; and commercial, financial and economic status (ADB, 2008), and set a clear sector strategy and road map and government commitment and a designated champion coupled with sufficient stakeholders consultation (Refer to Figure 2.2, p. 80). This goes without saying that successful implementation of a PPP may also largely depend on how the PPP was structured. This will be critical for any proposed existing PPP Model implementation in the Zambian Water and Sanitation sector.

While a wider range of PPPs schemes have been implemented in Western and Central Africa (Fall et al., 2009), Europe, Asia and America (Partnershipbc, 2003; PartnershipsUK, 2012; HM-Treasury, 2012; ACCA, 2012; Kappeler & Nemoz, 2010), according to Fall et al. (2009), successful PPPs implementation would require the following:

- The need for a challenging environment with no room for mistakes by paying more attention to preparation and implementation;
- Affermages appears to be a well-adapted PPP Model in the region due to its remarkable benefits;
- Successful PPPs require the involvement of the local partners to inculcate the required interest and ownership;
- Successful partnership require well-designed sector reforms such as unbundling the key functions of policy formulation, regulation, financing, asset ownership, service provision and establishing contractual relationships between public and private partners.

This is similar to Zhang & Jia (2009) who assert that successful implementation of PPPs depends to a larger extent on the development of sound legal procedures, agreements and contracts that clearly defines the relationship between the two parties. It is further noted that without thoughtful and professional legal frameworks and contracts, disputes are likely to occur (Institute for Public-Private Partnerships, 2000b cited in Zhang & Jia, 2009). The case for Zambia is that various institutional, policies and legal frameworks are in place (National Water Policy, 1994 and 2010; Water Supply and Sanitation Act, 1997; Water Resources Management Act, 2011; PPP policy and Act, 2009) to support the efficient and effective

implementation of the PPPs to be initiated. As to whether the institutional and legal framework currently in place is sufficient or not is a matter of opinion. Nonetheless, Fall et al. (2009) argue that given the scarcity of qualified professional and character of the local political economy, the establishment of an “independent” or even an “autonomous” regulatory agency has arguably added little value to the PPPS.

While PPPs have often been credited with outstanding success in certain cases, it has also been strongly contested with a number of shortcomings (Ghobadian et al., 2004). Various performance measures and/or factors have been used to determine the performance of PPPs Models (successes and failures). These include among others Institutional and legal frameworks, VFM and risk allocation and responsibilities. Cost, time and quality factors cannot be delinked from these performance measures and can affect both risk and VFM and impact on PPPs Model effectiveness. The literature points to the fact that cost, time and quality factors have not been addressed independently and adequately in the determination of effectiveness and in relation to existing PPP Models. For instance, Ahadzi (2004) research focused more on PPP in infrastructure procurement and came up with a generic model of minimising pre-contract time and cost overruns and not extended to their implementation. Fall et al., (2009) in their report have highlighted some performance ratios based on data from UNICEF/WHO on impact of PPPs to help achieve the MDGs. It is reported that both coverage and connection ratios have improved towards the MDGs targets though in some cases there is a slump. The report also notes that a certain level of reliability has been achieved, operational efficiency is essential for financial sustainability and that successful PPPs have reduced water losses attributed to Non-Revenue Water (NRW), have helped improve water resources management, and water tariffs have usually declined in constant terms. Similarly, Martin’s (2009) performance analysis of four performance dimensions of access, quality service, operational efficiency and tariff levels suggest that the overall performance of water PPP projects has been generally quite satisfactory despite limitations relating to data, reliability and the ambiguity of indicators. Martin (2009) concludes that water PPPs are a viable option in developing countries. Nonetheless, assessing performance of PPP Models still remain controversial although a well-designed partnership could be a valid option to turn around poorly performing water utilities in developing countries.

The other factor key to assessing PPP Models performance includes value for money (Cheung et al., 2009a; Zou et al., 2008; Nisar, 2007; Pitt and Collins, 2006). This includes other measures such as time, cost, and quality and resonates well with risk factors. Nonetheless, ONG (2003) concludes that a successful partnership depends largely on the nature of the project, the commitment of the partners involved and the ability to communicate and willingness to trust. Their applicability cuts across developed and developing countries, Zambia alike though their context, purpose and perspective may differ depending on the agreement and thrust.

2.8.3 Summary

It is discernable from the literature that the PPP/PFI concept is quite diverse in context, purpose and perspective and remains a complex undertaking though still developing globally. It has been used globally and signifies an important strategic tool that could be used to leverage the benefits between the public and private sectors. It is also true that a PPP may delineate new concepts depending on the country's contextual environment in which they are undertaken thus various performance measures and indicator may vary accordingly. Nonetheless, there seem to be some commonalities in the manner PPPs are viewed. At least, there are parties involved; some form of contractual obligation to provide a service or otherwise; aspects of risks and related responsibilities; levels of ownership; a strategic option tool to deal with perceived weaknesses of parties involved etc. although these may not all be embedded in one definition. Regardless of the parties involved, either party looks forward to some form of economic benefits that may come in various forms and constitute critical pedagogical factors in enhancing public service delivery. To a larger extent, this determines the reasons or motive behind parties going into PPPs. Nonetheless, the involvement of both the public and private sectors to form a partnership based on their respective perceptions underpins the concept.

Like in many other developed and developing countries, PPPs have been used and continue to be used in various sectors of the economy such as transport, energy, construction, health, agriculture, water and sanitation etc. This entails that PPPs are widely applied as a means of raising finances and/or value addition in the provision of goods and services to the public. Regardless of the sector in question in which the PPP is applied, differences in purpose,

context and perspective, a PPP commands a wider acceptance globally thereby making it relevant to any countries context like Zambia. This is also true in that the Zambian MLGH that is vested with the mandate to provide the water and sanitation has commercialised the water supply and sanitation sector through the regulator - NWASCO. Commercialisation is considered to be similar to some form of PPP (McDonald and Ruiters, 2005).

It is also discernible from the literature that there are a number of challenges in determining PPP performance especially as it relates to quantification measures as opposed to qualitative measures. Not much has been done to assess existing PPP Model effectiveness using factors of cost, time and quality in their implementation especially in the water and sanitation sector. The need to establish how the three factors would relate in such a measure would also assist to strength the study in a bid aimed at minimising these gap. Therefore, in determining the usefulness of existing PPP Models in the sector, the researcher intends to investigate the use of existing PPPs Models in the development of the Zambian water and sanitation sector for increased effectiveness using cost, time and quality measures in order to inform future PPPs practitioners' intending to research in this area. The researcher intends to investigate into the use of existing PPP Models for increased effectiveness in the Zambian Water and Sanitation Sector taking into account the fact that there are no formal PPPs implemented yet in the sector in question. This will culminate into the development of a suitable Conceptual Beta Model that would be used by the government and other researchers. It will then act as a basis for future research on PPPs in the Zambia Water and Sanitation Sector and hoped that this research will set a tone in as far as evaluation of PPPs is concerned using factors of cost, time and quality. Subsequently, this has informed the questionnaire design and subsequent interview survey that form part of the methodology and leading to the gathering of data and subsequent analysis of results and discussion.

Chapter Three:

3.0 Research Methodology

3.1 Introduction

The literature review chapter focused on demonstrating a wider knowledge base of Public Private Partnerships (PPPs) drawn from diverse schools of thought that constitute existing body of knowledge of the subject matter. The views advanced by various scholars and their respective contributions to the subject of PPPs are documented, related and contrasted in order to provide a reasoned view based on the research at hand. This was done in a bid to justify the need to develop and propose a suitable conceptual model to be initiated in the Zambian Water and Sanitation Sector, based on lessons to be drawn from existing PPP Models using factors of cost, time and quality that will be subsequently tested. As such, and in line with the first objective, i.e. *“To identify and conceptualise existing Public - Private Partnerships (PPPs) Models commonly used in PPPs arrangements.”* the literature review has provided a detailed understanding of the PPP concept from various perspectives. Various reasons that motivate parties to engage into PPPs have been alluded to and a number of arguments in support or otherwise provided. The literature review further addressed the PPP Models/schemes that are used in both developed and developing countries taking a global perspective, their implementation, performance and applicability to the water and sanitation and related sectors. In summary, the literature review has highlighted a number of key findings towards the set objectives.

This chapter therefore presents the research methodology and subsequent methods and/or techniques that were used for data collection and analysis. The research paradigms and theoretical framework aimed at giving a world view or general perspective to guide the investigation at hand are addressed in a bid to signify the philosophical paradigm adopted and to facilitate the investigation using acceptable methods or techniques. The methodology adopted allowed the collection of data that was documented and analysed and whose results there from assisted in answering the research question, i.e. *“Can existing PPP Models be used effectively in the development of the Zambian water and sanitation sector?”* The research proposition for this study was expressed as follows:

“Existing PPP models cannot be used effectively in the development of the Zambian water and sanitation sector”

The above research proposition was focused on addressing the objectives of the research, i.e.

- (a) To identify and conceptualise existing Public - Private Partnerships (PPPs) Models commonly used in PPPs arrangements.
- (b) To critically evaluate if existing models of PPPs can be used to increase cost, time and quality effectiveness in the case of the development of the Zambian Water and Sanitation Sector.
- (c) On the basis of objectives (a) above, to suggest an implementable model of PPP for the Zambian water and sanitation sector.

A preliminary PPP Process Model (Alpha Model) is developed followed by a subsequent final PPP Process Model (Beta Model) that conceptualises the PPP effectiveness in the development of the Zambian Water and Sanitation Sector. In a research by Li (2003) on risk management of construction PPPs projects, whose aim was to develop a framework for successfully managing construction PPP projects, and though not completely similar, Li (Op.cit) used factors of VFM (cost savings; sustainability; risk transfer and public effective procurement) and Critical Success Factors (technological and economy improvement; benefit for the public; government avoidance of regulation constraints and government savings in transaction costs). Therefore, in determining the effectiveness of existing PPP Models, the focus was based on factors of cost, time and quality that were subjected to the rigours of empirical testing before they can be considered knowledge. The research methodology structure was provided in the introductory paragraph – Figure 1.3 above on page 26.

3.2 The Research Paradigm and Theoretical Framework

In order to focus, direct and shape any research undertaking, there are a series of pedagogical aspects that feed into each other and need to be established and framed in some form of systematic and/or critical thinking. These are theories behind research norms that may feed into certain philosophical commitments such as epistemology, ontology and axiology. Epistemology constitutes acceptable knowledge in a particular field of study and addresses the aspects of positivism, realism and interpretivism. Ontology is concerned with nature of

reality and raises questions of the assumptions researchers have about the way the world operates and the commitment held to particular views. It addresses the aspects of objectivism (how social entities exist in reality external to social actors) and subjectivism (understanding the meanings that individuals attach to social phenomena) and axiology (studies judgements about values) that anchor various research propositions.

As to what constitutes the most important determinant of the epistemology, ontology and axiology to be adopted, pragmatism argued that the research question is the best determinant (Saunders et al. (2009). Nonetheless, various scholars have given their views in agreement, partially or in full, based on already established and acceptable knowledge in the field of research on how research should be conducted using various research methods (broader perspective) cutting across various research philosophies, approaches, strategies, techniques and procedures to be employed. Saunders et al. (2009) uses a research ‘onion’ that acknowledges a number of layers that need to be peeled away before data can be collected to answer the research question (Table 3.1 below refers).

3.2.1 Competing Paradigms.

According to Bryman and Bell (2011) and Saunders et al., (2009), the key influence on understanding the epistemological and ontological foundations of business research has been Burrell and Morgan’s (cited in Bryman & Bell 2011 and Saunders et al., 2009) four paradigms, i.e. functionalist, interpretive, radical humanist and radical structuralist. It is suggested that they reflect the assumptions researchers make about the nature of organizations and could to some extent underpin its philosophical nature. Need therefore arises to establish a particular paradigm to direct the study.

A paradigm is a term frequently used in the social sciences but one which can lead to confusion because it tends to have multiple meanings (Saunders et al 2009: 118). It is common to assume that research methods are the same as a research paradigm. According to Saunders et al (2009: 106), the question of research methods belong to the centre of the research ‘onion’ by which means the issues underlying the choice of data collection techniques and analysis procedures are depicted (Figure 3.1 below refers). In other words, the research methods follow the research approach that is normally attached to a particular philosophy adopted. For instance, a research method may follow the deductive approach and

owes more to a positivism philosophy. Similarly, a research method may follow the inductive approach and owes more to interpretivism. Nonetheless, Saunders et al., (2009) believe that such labelling is potentially misleading and of no real practical value. In justifying the positioning of a paradigm in the ‘onion,’ Saunders et al (2009: 106) quote Guba and Lincoln who argues that the questions of research methods are of secondary importance to questions of which paradigm is applicable to your research.

“...both qualitative and quantitative methods may be used appropriately with any research paradigm. Questions of method are secondary to questions of paradigm, which we define as the basic belief system or world view that guides the investigation, not only in choices of methods but in ontologically and epistemologically fundamental ways” (Guba and Lincoln 1994:105).

Further definitions of a paradigm are provided below:

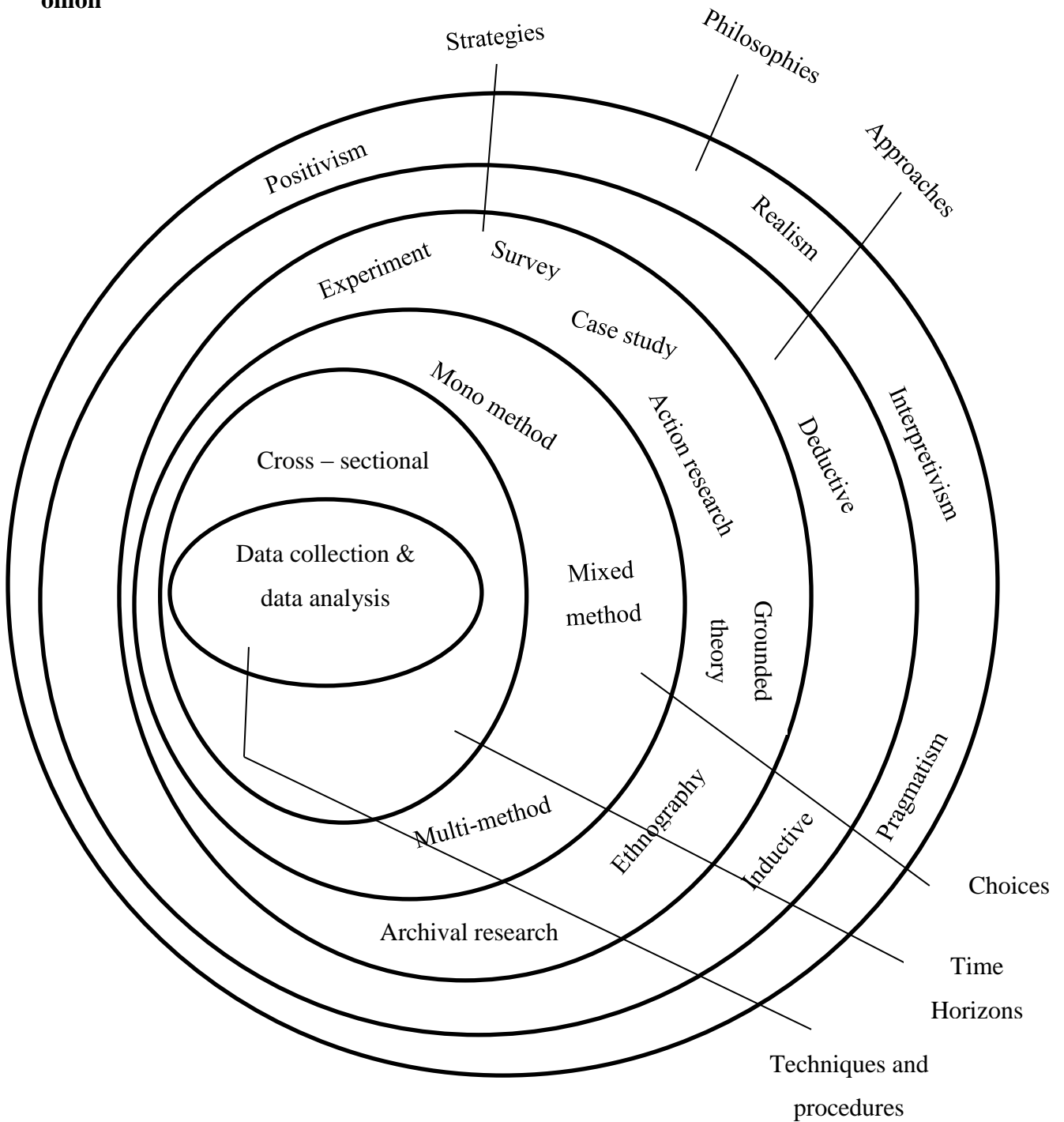
“A way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted”. Saunders et al. (2009: 118)

“A world view, a general perspective, a way of breaking down the complexity of the real world” (Patton 1978, p. 203 cited in Paramio Salcines 2000), or

“The source of methods, problem-field, and standard of solutions accepted by any mature scientific field at any given time” (Kuhn 1970, p. 103 cited in Paramio Salcines 2000).

However, and according to Bryman & Bell (2011: 24), the four paradigms are incommensurate with one another and that each paradigm must therefore develop independently of the others. This argument provides some form of perspective to allow the adoption of a suitable paradigm for the research at hand.

Figure 3.1: Understanding the research philosophies and approaches – The research onion



Source: Saunders, Lewis and Thornhill – 2008.

Given the broader scope of paradigms as indicated above, two common paradigms (positivism and interpretivism) have been contrasted in order to assist in the adoption of the paradigm suited for this research as indicated below.

3.2.1.1 Positivism Paradigm

The positivist paradigm uses a quantitative deductive approach to research and allows the researcher and his or her values separated from the topic of the research (Saunders et al. 2009). It is one of the epistemology that constitutes acceptable knowledge in a field of study. This is a philosophical stance of the natural science that involves working with an observable social reality and that the end product of such research can be law-like generalisations similar to those produced by the physical and natural scientists (Remenyi et al. 1998, p. 32 cited in Saunders et al. 2009, p. 113; Bryman and Bell 2011, p. 15). It involves the economic collection of large amounts (sample) of precise and comparable data under the control of the researcher to permit generalisation to populations, establish the theoretical framework from the outset and allows replication. Nonetheless, the term stretches beyond the principle of natural science and as they relate to social reality though the constituent elements may vary between authors. Positivism could entail the following principles namely, the principle of *phenomenalism*; *deductivism*; and *inductivism* (Bryman & Bell 2011: 15).

Saunders et al., (2009) note that it is perfectly possible to adopt some of the characteristics of positivism in a research, e.g. hypothesis testing, and uses largely qualitative methods. Positivism is therefore the epistemological position that advocates working with an observable social reality and the positivist researcher is likely to use a highly structured methodology in order to facilitate replication (Grill and Johnson, 2002 cited in Saunders et al., 2009). The emphasis is therefore on quantifiable observations that led themselves to statistical analysis.

This is also in line with Wilson (2006: 135) definition of a quantitative research, i.e. a research undertaken using a structured research approach with a sample of the population to produce quantifiable insights into behaviour, motivation and attitudes. It is more structured, involves large samples (100 to 200), more easily replicated, data can quantify the incidence of particular qualitative factors and analysis of quantitative studies tend to be more statistical in nature.

3.2.1.2 Interpretivism Paradigm

Where the social world of business and management is far too complex and cannot lend itself to theorising by definite laws in the same way as the physical sciences, a research philosophy nearer to that of the interpretivist is used. According to Bryman and Bell (2011: 17), interpretivism denotes an alternative to the positivist orthodoxy that has held sway for decades. It is predicated upon the view that a strategy is required that respects the differences between people and the objects of the natural sciences and therefore requires social scientists to grasp the subjective meaning of social action. The heritage of this strand of interpretivism comes from two intellectual traditions namely phenomenology and symbolic interactionism (Saunders et al. 2009: 116; Bryman and Bell 2011).

The phenomenological paradigm takes a qualitative inductive approach to research (Para. 3.2.1.1 above refers). It is an epistemology that advocates the differences between humans in our role as social actors. It is about how humans make sense of the world around us (Saunders et al. 2009: 124-127; Bryman & Bell 2011: 18). According to Bryman & Bell, the initial application of phenomenological ideas to the social sciences is attributed to the work of Alfred Schutz (1899 – 1959). This is a more subjective assessment required through the use of qualitative data mainly collected through interviews in order to set the main study results in context. A phenomenological paradigm plays a vital role in explaining and understanding business behaviours and performance.

On the other hand, the symbolic interactionism assumes that we are in a continual process on interpreting the social world around us. We interpret the actions of others with whom we interact and this interpretation leads to adjustment of our own meanings and actions (Saunders et al. 2009: 115; Bryman & Bell 2011: 17).

3.3 Methodology Adopted

The methodology that was adopted and employed in this study depended on a number of factors such as the nature of questions and objectives set; amount of data to be collected; emphasis of quantification of data leading to statistical analysis; ability to replicate etc. The nature of the question and objectives set for this study suggest more of a quantitative research strategy than qualitative meaning that hypotheses, testing is required. This entailed that the

study required the economic collection of large amounts of quantifiable observations that would lead to precise and comparable data (using descriptive statistics) under the control of the researcher to permit generations of population, establish the theoretical framework from the outset, and allow replication. Quantification was more emphasised in the collection and analysis of data, i.e. deductive approach in testing the theory, practices and norms of the natural science model and of positivism and embodies a view of social reality as an external, objective reality (Saunders et al. 2009; Bryman and Bell 2011).

While it is perfectly possible to work with both philosophies (pragmatism view), and considering that mixed methods of both qualitative and quantitative could be highly appropriate in this study, the positivist paradigm comes out predominantly and more suited to the research at hand while taking into account the suggestion of Tashakkori and Teddlie's (1998 cited in Saunders et al. 2009) of adopting a philosophy as a continuum rather than opposite position. This research is therefore skewed more on an epistemological fundamental of the positivist paradigm.

Based on the above assertions, the positivism paradigm has been used as the main philosophy employed in the research coupled with a detailed literature investigation to assist in the build-up of both the Alpha and Beta Models. It follows both theory and strategy where a deductive research approach is assumed in determining the effectiveness of existing PPP Models using factors of cost, time and quality though some elements of inductivity were also employed as a result of the knowledge to be arrived at through the gathering of facts from various experts in the industry. According to Bryman and Bell (2011) the last step of the deductive process involves induction.

As indicated above, the research orientation employed was primarily quantitative with some qualitative elements in order to allow a meaningful determination of results. This is regarded as being appropriate considering that the study is focused on a single purpose of determining statistically whether existing models of PPPs would be effective in the development of the Zambian water and sanitation sector. All the water utility companies in question have similarly characteristics in terms of their operational nature and are managed under the same ministry of Local Government and Housing. Questionnaires and semi-structured interviews were administered and conducted respectively and analysed statistically. In this way, a more

comprehensive understanding of the research phenomenon was facilitated and the research question addressed in totality. Results obtained from the research will allow the researcher to conclude generally, for example, that existing PPP Models can be used effectively in the development of the Zambian water and sanitation sector and comment on their reliability. The use of multi-methods (quantitative and qualitative) approach allows for triangulation or 'post – positivism' as a matter of realism (Saunders et al. 2009: 152) and a better approach to assist in the development of the conceptual model. For instance, a literature review technique was also used to investigate the effectiveness of PPPs (Gunnigan 2007) and the development of PPP models (Gunnigan 2007; ONG 2003). ONG (2003) while using the post-positivism philosophy, used a combination of literature investigation and inductive reasoning to build a model.

The quantitative and qualitative assessments of the existing PPP Models will in a way inform and shape the PPP Model to be introduced in the sector. Four (4) models were investigated through questionnaire and interview surveys which were conducted in the sector in question in order to assess, analyse, evaluate and set into context their suitability. Gunnigan (2007) used a similar approach to research though the research was qualitative in nature. This will allow an evaluation of the effective use of existing PPP Models in the sector.

Arising from an investigation of existing PPP Models using factors that affect effectiveness and using results from the questionnaire survey and interviews comparatively, and while attending to deviations, a conceptual mapping process was used to develop both the Alpha and subsequent Beta Models acceptable in the Zambian Water and Sanitation Sector. According to Pidd (2003: 138 – 168), a model is one of the tools for critical thinking. Cooper and Schindler (2008: 70) define a model as a representation of a system that is constructed to study some aspect of that system or the system as a whole. The developed model will therefore be a representation of a PPP Model to be developed in the Zambian Water and Sanitation Sector based on cost, time and quality effectiveness. The model would allow or facilitate in this case the initiation and implementation of future PPPs in the sector in question if acceptable to the implementers.

While there have been no PPPs in the sector in question, PPPs have been done in the construction sector and knowledge acquired from this will act as part of the learning agenda.

While the standards for measuring performance in the construction sector may slightly differ from that of the water sector, the common denominator is about achieving the set results and objectives (refer to glossary of terms). The use of the water utility companies, the regulatory authority and other stakeholders will provide cross-sectional views to assist in the establishment of whether existing PPP Models could be used effectively in the sector and also assist in the development of the process model. Details of both the data collection instruments to be used are provided below:

3.4 Sample Selection and Size

The sample was based on eleven (11) water utility companies and 11 City and Municipal Councils. This was based on the fact that there are eleven (11) water utility companies in the nine provinces of Zambia represented by three (3) City and eight (8) Municipal Councils respectively. These were purposely selected for data collection purposes. The water utilities by virtue of their set up are interconnected and interdependent with the Councils thus interrelated to one another in their respective provinces mostly affecting urban and peri-Urban population. All the water utilities were used in the study with their corresponding councils. This provided sufficient scope for the case size to be fully represented in this research. The sample also included some senior Government officers, private contractors, and other stakeholders in both the infrastructure and service delivery sectors, donor communities and regulatory authorities such as NWASCO. The choice of the companies and other respondents was based on their involvement in the provision of water and sanitation services to the urban and peri-urban and infrastructure sector of the Zambian population, provision of advice and support and their respective sector interest. Non-probability as opposed to probability sampling was used. In particular, purposive/judgemental sampling was used considering that the intended purpose was to get views from the target group with some PPP experience (not necessarily in the water sector) and/or those with expressed interest in PPPs. Purposive sub-case expert and non-proportional quota sampling was useful for individual respondents in order to allow solicitation of data from experts. Purposive sampling was also used based on managers' formal strategic positions in the organizations as used by (Paramio Salcines, J.L.P 2000). Nonetheless, and considering the nature of the sampling method used, an "elite bias" could be possible. This was minimised based on the proportional distribution of the respondents as shown in Figure 4.2 on page 117 (Data

analysis and presentation of results) where it was observed that 83 percent of the respondents represented strategic level managements with 32 percent and 51 percent for top and middle management respectively.

A sample size of 300 was used to obtain data from respondents from the eleven water utility companies, respective City and Municipal Councils, regulator and other stakeholders. This acted as a reasonable sample frame targeting managers at higher/middle levels with sufficient organization knowledge and experience. In other words, purposive sampling within a particular company or institution was based on higher level managers in strategic positions and level of operations. At least 180 responses were received and represented a response rate of about 60%. The response rate could have been lower than this had it not been the researcher's familiarity of the industry and interaction that he has had with the target respondents during the many workshops and seminars conducted. It was also observed that at some point, the data collected from commercial utilities was not much of a difference from what was collected in the earlier questionnaires, thereby deducing that a point of saturation was somehow reached.

Generally, questionnaire responses are normally low and not uncommon on PPPs. In related researches, Hay (2009) used a sample size of 211 with an overall return rate of 29%; Li (2003) and Li, et al. (2005) had 61 respondents (representing 12.2% of the total survey target of 500, though used a postal questionnaire and similar survey by the Institute of Public Policy Research only produced 9.7% response rate.

3.5 Data Collection Procedures

3.5.1 Questionnaire survey

A questionnaire survey technique was used to gather preliminary data to be used to investigate PPP Model effectiveness using three factors of cost, time and quality. At least 300 questionnaires were used to obtain data from respondents from the eleven water utility companies, respective City and Municipal Councils, regulator and other stakeholders. This was considered as a reasonable sample frame targeting managers at higher/middle levels with sufficient organization knowledge and experience and as alluded to in the sample selection and size paragraph above, a response rate of about 60% was achieved mainly based on the

researcher's familiarity of the industry and interaction that he has had with the target respondents during the many workshops and seminars conducted. Access to respondents was not therefore a bigger challenge despite some not being available due to other commitments.

Questions were designed to include aspects of knowledge of PPPs, number of years in the institution/organisation, and those aimed at measuring PPP models effectiveness in the Zambian water and sanitation sector such as cost, time and quality (See Appendices 2 & 3). A comparative case selection was also applied for an investigation of effectiveness in the real world view. This entailed considerable literature review (Gunnigan 2007; ONG 2003) on existing PPP Models to feed into the questionnaire and interview methods that was used.

Data collected using questionnaires was coded, entered, processed, linked and analysed quantitatively using EpiData software package and exported to the SPSS software to produced statistics that examined relationships, differences and trends. Data was also processed using Microsoft office programmes such as spread sheets and word to generate graphs, charts and tables in order to deduce the results there from and analysis done using the Data Analysis and Interactive Models by Miles and Huberman (1994) and displayed using metrics, graphs, charts, and tables along with a descriptive discussion of the results.

While the Structural Equation Modelling (SEM) is considered as a suitable techniques in determining the causal effects on the dependable variable (effectiveness) by the independent variables (cost, time and quality), thus confirmatory rather than exploratory in nature, SEM usually focuses on latent constructs (abstract psychological variables like "intelligence" or "attitude" rather than on the manifest variables used to measure these constructs). This research was focused more on measurable factors than latent constructs although latent constructs could be operationalized in a measurable way. Since the variables being used are already in measurable form, there is no need to start operationalizing them as may be done using SEM.

3.5.2 Semi – Structured Interviews

Semi – structured interviews were conducted with selected respondents in water utility companies and related institutions and individuals based on their knowledge levels and expertise. The purposive selection was a combination of some Board members and senior

managers in the water utility companies and councils; the regulator; PPP unit and selected stakeholders in the water sector, Government, contractors and cooperating partners. The interview survey was therefore used to gather among others individual knowledge or involvement in PPPs; sectors in which PPPs are implemented; data on sector resources (mainly funding) and sufficiency; data on PPPs, PPP Models they can opt for; attracting private sector and any obstacles; guidelines, policies, legislation etc.; and their views on cost, time & quality factors as they affect effectiveness. This data gathered from the interview survey was in line with what was requested for in the questionnaire. In this way, data and information from the questionnaire was validated by data and information arising from interviews. The interviews were pre-arranged within the specified time and though difficult to find the respondents due to numerous rescheduling of interviews leading to cancellations of some, 11 respondents out of a target of 15 were interviewed representing a response rate of 73 percent. Their views on the cross section aspects assisted in the perfection of the Alpha Model on what would make a good PPP Model to be used in the water and sanitation sector and the final determination and verification of the Beta Model.

Data was recorded using a Digital Voice Recorder (DVR). In transcribing the interviews conducted with respective experts on how they felt on increasing the effectiveness of PPP Models using cost, time and quality factors, the content analysis technique was used to analysis common responses using concepts and themes (conceptual analysis) and extending this to examining the relationships among the concepts and themes (relational analysis) to build on the former considering the relationship that may subsist amongst the three factors of cost, time and quality. In this context, content analysis is an approach used to analysis documents and text that seek to qualify contents in terms of predetermined categories and in a systematic and replicable manner (Bryman and Bell 2011). It can as well be used with either qualitative or quantitative data and in an inductive or deductive way (Elo & Kyngas, 2007). In this study, it was more of quantitative and deductive. The words, concepts, themes, and phrases were identified, coded and broken down into manageable categories and quantified in an objective manner. The coding was done based on frequency of concepts signifying the importance of the concept. The concepts were distinguished based on the thrust of the questions and/or thrust. Based on the numbers of occurrences recorded, Data was processed using Microsoft office programmes such as spread sheets and word to

generate graphs, charts and tables in order to deduce the results there from and in line with Data Analysis and Interactive Models by Miles and Huberman (1994). Data was displayed using metrics, graphs, charts, and tables and some data not coded but considered informative was quoted in the results analysis.

3.5.3 Collaborative Information on both Questionnaire and Interviews.

Information from the literature, questionnaire and interviews were used into the development of a final process model based on factors that increase PPP Model effectiveness. The model will act as a starting point for the formal introduction of PPPs in the sector if need arise. ONG (2003) and Ahadzi (2004) developed and validated similar models though not in the same sector.

A number of researches have used similar techniques before where both questionnaire and interview surveys are used or one of them. For instance, Cheung et al. (2009a) and Cheung et al. (2009b) used questionnaire survey on enhancing value for money and when investigating reasons for implementing PPPs projects respectively; Medema (2008) used semi-structured interview on Integrated Water Resource Management. Fischer et al. (2010) used a combination of questionnaire and expert interviews when looking at integrated risk management systems for PPPs projects. Similarly, ONG (2003) used both questionnaires and semi-structures interviews whereas Jamali (2007) and Jacobson and Choi (2008) used both literature review and survey in a customer satisfaction study. Both questionnaires and interviews have been used in similar PPPs research (ONG 2003). Data triangulation approach has also been used by Lattemann et al (2009) and Gunnigan (2007).

It is also important to note that consent was obtained from the interviewees for an interview as a way of ensuring that data was obtained in good faith and at arm's length. The researcher has also interacted with various senior managers' employees of these companies and other sector stakeholders through workshops, inaugural forums of the Zambia Water Forum and Exhibition (ZAWAFE) and numerous seminars conducted for more than 10 years now. This made data collection easier than it could have been.

3.5.4 Piloting of Data Collection Instruments

Ideally, a pilot study could have been carried out to test the design of the full-scale study in order to improve on the latter's quality and efficiency. This was not the case considering that a pilot study could have reduced the target sample population for the full research. The reason was that doing so would have reduced the sample population meant for a full study and not therefore influence the later behaviour of research subjects if they have already been involved in the research. The majority of the target respondents are in the same sector and exposed to the same or similar operations, i.e. the water and sanitation sector. All of the water and sanitation utility companies formed part of the sample population with mostly senior and middle managers being the target.

In order therefore to ensure the integrity of the data that was collected from the respondents, both the questionnaire and semi-structured interview instruments were pre-tested and exposed respectively in selected institutions to ensure appropriateness of the questions in terms of suitability and understanding. The instruments were pre-tested in three institutions namely, NWASCO (the regulator), the PPP Unit and MLGH. NWASCO regulates all the water utilities there by providing a helicopter view on their operations. The PPP Unit facilitates implementation of all PPP projects thus command sufficient knowledge of PPP issues and the MLGH is the overall shareholder of all the water utilities. The involvement and comments on the piloted questionnaire and interview surveys signified a common direction and compatibility with other respondents in the main sample. A similar undertaking was done by Li (2003), Li et al. (2005) and ONG (2003). They covered a wider range of issues pertaining to how the effectiveness of PPP Model could be determined using factors of cost, time and quality.

3.5.5 Reliability, Validity and Transferability

The research took a quantitative approach to analysing the data based on a sample of 300 respondents. This approach allowed this sample of the population to produce quantifiable insights using questionnaires and interviews that can easily be replicated and considered reasonable to validate the expected results. The data collection instruments were also piloted as in paragraph 3.5.4 above to expert respondents. This was aimed at ensuring integrity and reliability of the data to be collected and the results therefrom. In other words, the data

collected was based on well-informed sources with experience in the subject at hand. Similarly, the use of both questionnaire and interview as data collection instruments allowed validation based on data triangulation. Triangulation is said to overcome the intrinsic bias and errors associated with single methods by cross checking the data and findings (Denzin, 1970 cited in ONG 2003; Bryman & Bell 2011; Saunders et al. 2009; ONG 2003). Denzin (1984 cited in ONG 2003) refers to the following methods of triangulation.

Data source triangulation – This involves the use of a variety of data sources such as questionnaires, interviews etc. The researcher looks for the data to remain the same in different context. This form of triangulation has been used in this research by employing both questionnaires and interviews.

Methodological triangulation – This involves the combination of approaches in a single study such as a quantitative followed by a qualitative method. This is said to increase confidence in the interpretation. This form of triangulation has been used in this study. Though the research methodology is based quantitative research, both qualitative and quantitative methods have been used in the gathering and analysis of data. The questionnaires were statistically analysed (thus quantitative) and the semi-structured interviews were qualitatively analysed (thus qualitative).

This research has therefore used both questionnaires and interviews patched up with a detailed literature review.

3.5.6 Ethics and Accessibility

This research does not pose any ethical challenges as most of the information is in public domain. Physical access and cognitive access as may be termed by Saunders et al. (2009) was granted in all the key institutions where the respondents are. This is coupled with the fact that the researcher has had numerous interactions with most senior and middle managers operating in these institutions, firstly having been a civil servant for more than 13 years and secondly, through the many workshops and seminars conducted and attended. Consent forms were used to solicit participation of respondents in the interview and the respondent indicating what he/she feels about the disclosure of data or information obtained. This provided some form of safe guard in the manner the interviews was conducted and in the

event something contrary is done, the respondent could have some form of recourse. Nonetheless, as a chartered accountant, the researcher is bound by the ethical and code of conduct befitting the profession and as a long serving civil servant, the researchers was sworn in not to divulge any confidential information unless and/or otherwise compelled by law or public interest to disclose.

Chapter Four

4.0 Data Analysis and Presentation of Results:

PART A: Questionnaire Survey

4.1 Introduction

This part of the chapter aims at presenting the data analysis from the questionnaire survey and the results therefrom in a bid to assist in testing the research proposition. It is hypothesised that existing PPP Models cannot be used effectively in the development of the Zambian Water and Sanitation Sector (WSS). The decision will either be to reject or accept the research proposition. The critical analysis, evaluation and presentation of data collected based on the existing models of PPPs that are said could increase effectiveness of dimensions of cost, time and quality based on their respective attributes will therefore assist in determining as to whether the hypothesis holds true or false. The data collection in this preliminary study was achieved using a questionnaire survey designed to collect data on knowledge of PPPs and to determine how the use of existing PPP Models could increase effectiveness of dimensions of cost, time and quality.

Before the questionnaire survey was administered to respondents, it was piloted in three institutions (PPP Unit, NWASCO and MLGH) as a way of exposing and pre-testing the appropriateness of the questions both in terms of the manner in which they were phrased and understanding of meanings. For instance, it was considered appropriate to get acceptability of the attributes used for each of the three independent factors. As a result, the pilot found some problems in the manner some questions and attributes were phrased and difficulties in understanding some of the attributes. For instance, the revised questionnaire had the number of attributes on cost, time and quality increased. The questionnaire was then revised based on the suggested changes from the three institutions. This was aimed at increasing the reliability of the data to be collected. A similar undertaking was done by Li (2003), Li et al. (2005) and ONG (2003) and samples of both the revised and original questionnaire surveys are provided in Appendices 2 and 3 respectively on pages 238-251. The selection of the three institutions for piloting of the questionnaire was based on the key roles played by these institutions in the water and sanitation sector. For instance, the PPP Unit is key in ensuring

that the PPPs environment is created and provided and it is empowered to engage both the public and private sector participation in PPPs arrangements by virtue of the PPP policy and the Act, No. 14 of 2009. On the other hand, NWASCO ensures that the WSS services are regulated by virtue of the Water Supply and Sanitation Act, No. 28 of 1997 and borders more on efficient and sustainable WSS services provision whereas MLGH provides policy guidance, technical and financial control, and facilitates mobilisation of foreign and local funds for capital development (Government of the Republic of Zambia, 2007: p. xv). These institutions have therefore a thorough appreciation and understanding of the PPPs and the WSS environment in Zambia and elsewhere and therefore were able to provide meaningful input and critic to the questionnaire that was administered forthwith.

The questionnaire was administered to the target respondents in order to explore their views and opinions and the results therefrom lead to the development of an Alpha Model based on the preferred PPP Model(s) and were further investigated through semi-structured interviews with selected experts in the PPPs environment in a bid to authenticate the Alpha Model and subsequent development and verification of the Beta Model. According to Belting (2008), an expert is a person who has a high degree of skill and knowledge in a certain domain, field or industry (in this case, PPPs environment) due to long-time experience and has status, power-to-act and decision-making opportunities based on these skills and knowledge. The semi-structured interviews were used to synergise the results from the questionnaire survey and aid in minimising the limitations of using an individual methodology. This underscores the importance of the triangulation approach to research that was defined in the methodology chapter above. In this way, the results from the questionnaire that culminated into the development of the Alpha Model were authenticated by the results from the semi-structured interviews in order to develop and verify the Beta Model. This allowed the research findings to be presented using a combination of both quantitative and qualitative methods and as a way to aid enrich the study.

In line with the methodology chapter, data have been analysed using descriptive statistics despite using a purposive sampling technique though the focus is mainly on frequency counts, percentages and mean values. The use of descriptive statistics on a purposive sampling technique is supported by Tongco (2007) who notes that statistical analyses have

been used with purposive sampling and cites Neupane et al. (2002), Albertin & Nair (2004), Belcher et al (2004) to have used statistical analyses such as logistical regression models, frequencies and chi-square, analysis of variance respectively. Similarly, in a research by Ojelabi (2009) that involved a purposive sampling technique, data collected were analysed using both descriptive statistics (frequency counts and percentages) and inferential statistics.

4.2 Questionnaire Survey: Results, Analysis and Discussion

Based on the planned sample of the population as identified and reported in the methodology Chapter, 300 questionnaires were distributed and administered to the target respondents cutting across Commercial utility companies, City and Municipal Councils, PPP Unit, MEWD, NWASCO, MLGH among others. These were considered as key respondents who have either a direct or indirect involvement in the Water and Sanitation Sector in general. More importantly, the data gathering process was done in such a way as to allow information build up and facilitate the development of both the Alpha and Beta Models based on the most preferred PPP Model(s) as a function of the independent variables (cost, time and quality). A total of 181 fully completed questionnaires representing a response rate of 60.33% were received and/or collected and subsequently analysed and discussed. The response rate is considered to be in line with other study reports done using similar data collection instrument and suffice to generate the desired results, e.g. (Hay 2009). The responses also represent views and opinions cutting across all the nine provinces of Zambia (mostly councils and water commercial utilities) in various geographical locations. The results have been analysed and discussed according to each section in the questionnaire and respective questions asked accordingly.

4.2.1 Part A: Classificatory information

Part A of the questionnaire required the respondents to indicate to which company, organisation, institution or sector they belong to. The data is therefore intended to show the source and distribution of responses and subsequent respondents' levels of contribution to the research once analysed. The source and distribution levels based on the frequency and percentages would also be indicative of the likely levels of knowledge of PPPs to be adduced to respective key target institutions such as commercial utilities and councils. The higher responses from these institutions would subsequently assist in the determination of existing

PPP Models effectiveness using dimensions of cost, time and quality as they are likely to appreciate more on issues of water supply and sanitation based on their direct involvement in the provision of water and sanitation.

Question A1

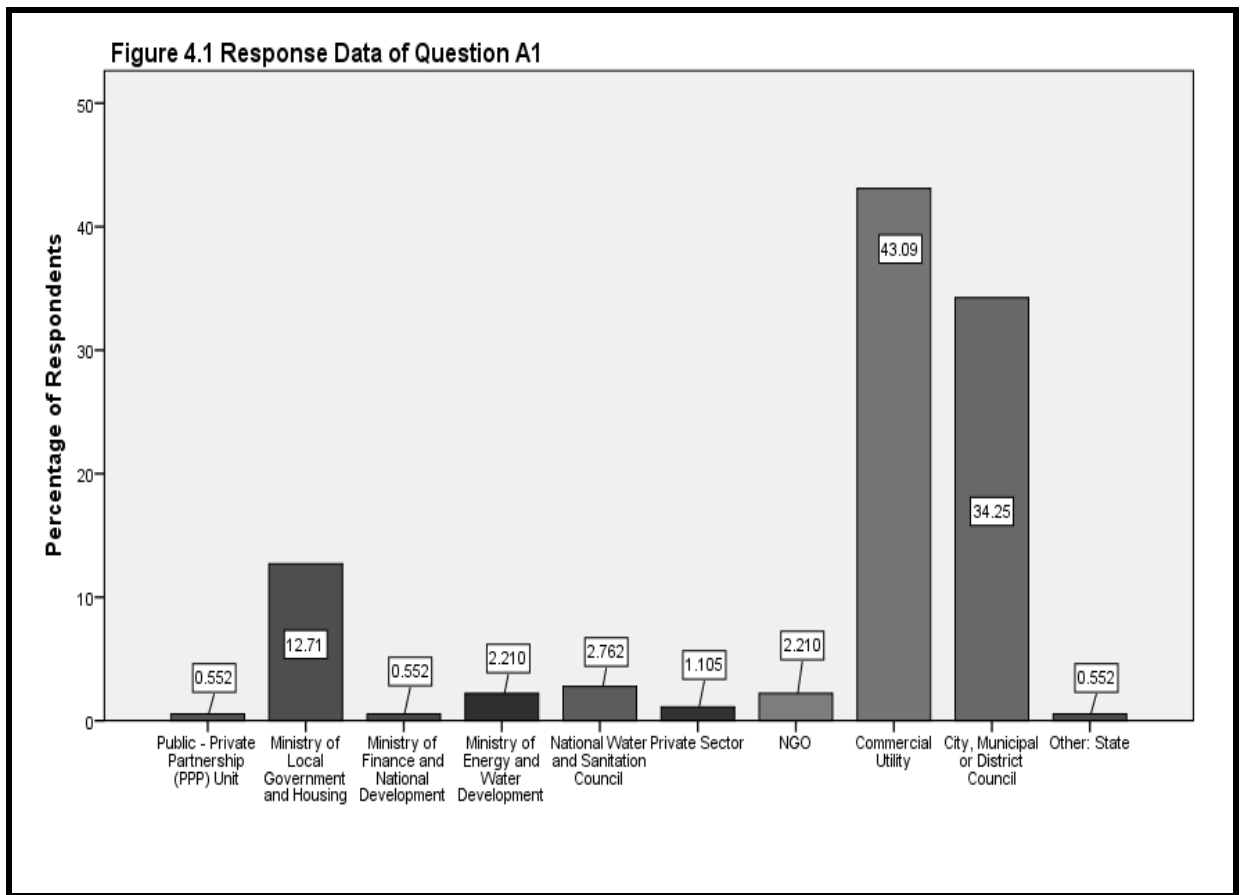
Respondents were asked to indicate as appropriate the institution to which they belong. Results show that 77.4 percent of the respondents were from Commercial Utilities and City, Municipal and/or District Councils an indication that these are the majority stakeholder institutions in the Water and Sanitation Sector in Zambia. The results are also in line with the information in the Introductory and Methodology Chapters that identify and indicate that the City, Municipal and District Councils, all operating under the MLGH, are the sole shareholders of respective Commercial Utility companies. Table 4.1 below shows the frequency and percentage of respondents for each of the institution.

Table 4.1: Respondents Company/Organisation/Institution or sector.

Company/institution	Frequency	Percent	Cumulative percent
Public-Private Partnership (PPP) Unit	1	0.6	0.6
Ministry of Local Government & Housing	23	12.7	13.3
Ministry of Finance & National Planning	1	0.6	13.8
Ministry of Energy and Water Development	4	2.2	16.0
National Water and Sanitation Council	5	2.8	18.8
Private Sector	2	1.1	19.9
NGOs ⁷	4	2.2	22.1
Commercial Utility	78	43.1	65.2
City, Municipal or District Council	62	34.3	99.4
Others: State	1	0.6	100.0
Total	181	100.0	

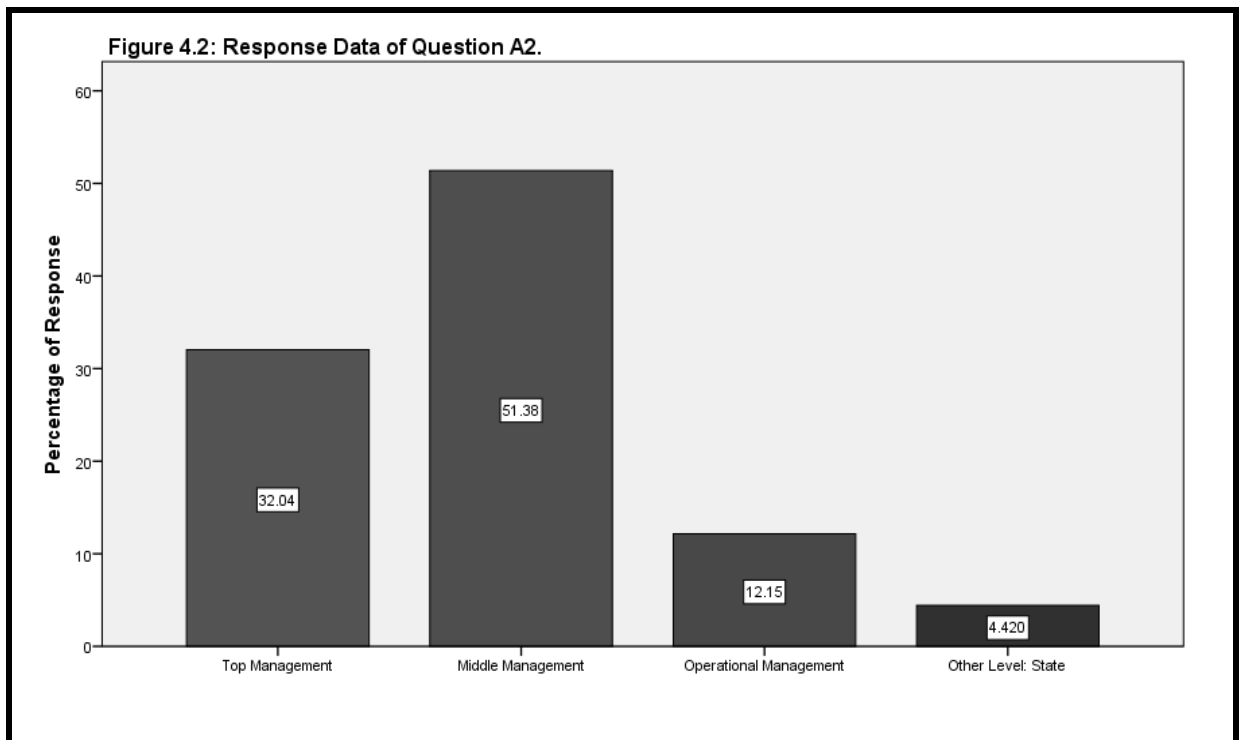
Further analysis shows that Commercial Utilities alone have contributed the highest response rate at 43.1 percent. Again this is in line with the situation on the ground where Commercial Utilities are ultimately involved in the provision of water and sanitation across the country. The above reasons explain why the data is skewed towards the three main grouping. Nonetheless, the rest of the respondents constitute stakeholders who are in the minority but make important contributions and/or decisions that affect the provision of water and sanitation. For instance, the PPP Unit and NWASCO have very few personnel directly

involved on technical issues of this nature. Thus their views are a representation of the institutions knowledge on technical issues of this nature. Nonetheless, the combination of the minority stakeholders that assumes a 22.6 percent is considered important and likely to influence the results of the research in some way. This is due to the fact that the MLGH (12.7 percent) provides a helicopter view (in terms of direction) on all the City, Municipal and District Councils. The PPP Unit (0.6 percent) through government provides the needed PPPs environment and oversees the coordination and implementation of all PPP projects across the sectors. The MOFNP (0.6 percent) provides policy direction, treasury function and overall coordination of all projects including PPP projects and the Private sector (1.1 percent) constitutes the other party to any PPP procurement and/or arrangement. The above analysis has also been reproduced in bar chart form in Figure 4.1 below.



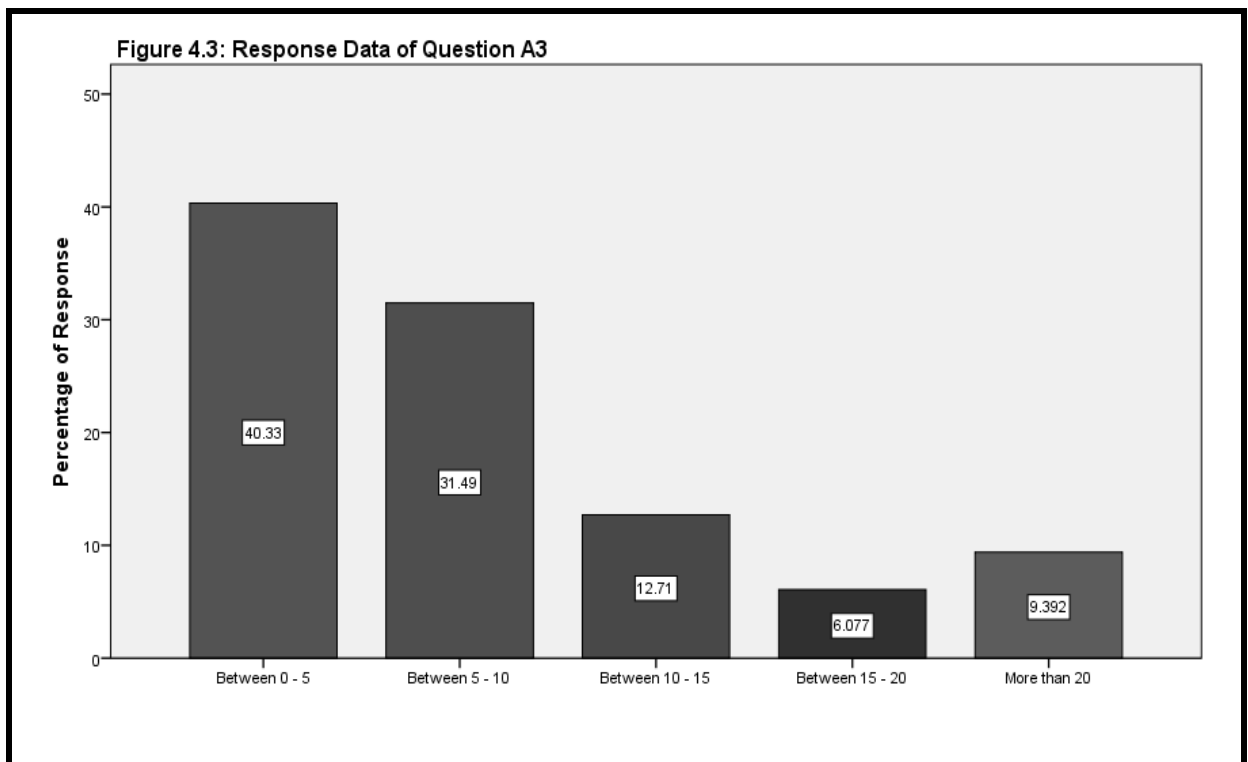
Question A2

Respondents were asked to indicate the category of management to which they belong by ticking the appropriate level. The results indicate that overall, 83.42 percent of the respondents represent strategic levels of management with 51.38 percent and 32.04 percent representing middle and top management respectively. This is an indication that the majority respondents are likely to have sufficient levels of knowledge expected to respond on the subject at hand considering their strategic levels in management. Staff in higher levels of management are normally exposed to sufficient organisational knowledge and involved in tactical operations of their respective institutions. Data provided could easily be replicated and relied on. The higher percentage at middle levels is considered normal in that most functional organizational structures normally have fewer numbers at the strategic apex and more at the middle level. Nonetheless, some operational level employees are likely to have vital knowledge of the operation nature of the institution and the few were purposively selected to participate in this research based on the number of years served in their respective institutions and knowledge of the research scope. As such, only 17.0 percent represents lower level management. These categories of management have been presented in Figure 4.2 below.



Question A3

Respondents were asked to indicate the number of years served in their respective institutions in order to provide the expected confidence levels in terms of organisation knowledge and operational nature. The results indicate that the majority respondents range between 0 – 5 years (40.33 percent) and 5 – 10 years (31.49 percent) representing 71.82 percent of the total respondents. The balance of 28.18 percent represents those above 10 year in the institution. This pattern of age distribution indicates that the further the range of years, the fewer the number of respondents with more years served in their respective institutions. Nonetheless, more than 59.67 percent ($31.49+12.71+6.077+9.392$) of the respondents have served more than 5 years in their respective institutions. While years within range 0 – 5 would be considered ideal depending on the level of management (say top management), the overall percent is more than 50.0 percent. This is considered to be sufficient in terms of organization and sector knowledge and understanding the operational nature of the institution and would contribute to ensuring validity and reliability of data obtained. Figure 4.3 below refers.

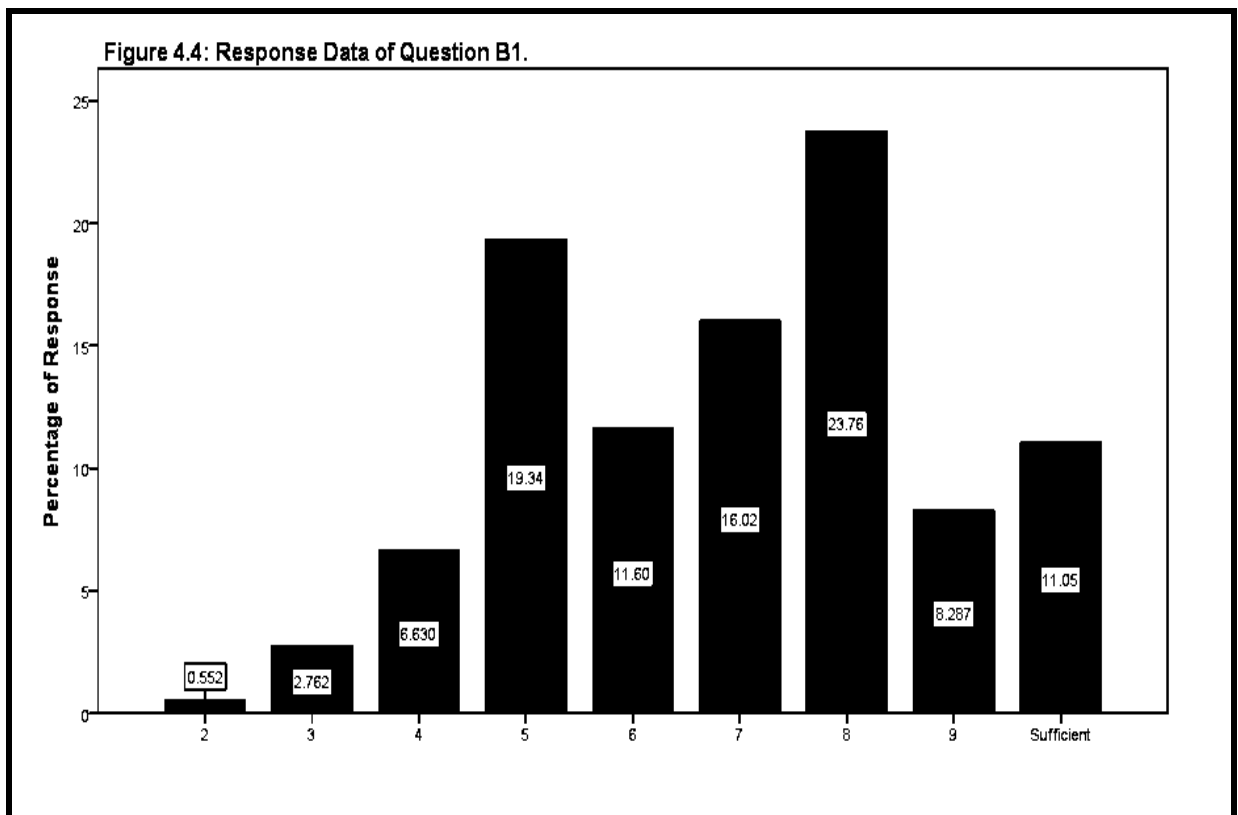


4.2.2 Part B: Public – Private Partnerships (PPPs) information

This section sought to determine the respondents' levels of knowledge of PPPs, the sectors in which they have been implemented or being implemented in Zambia or elsewhere, the type and suitability of PPP Model(s) that would be best suited in the Zambian Water and Sanitation Sector. The results have been presented separately for each of the three questions.

Question B1 and B2

Questions B1 and B2 sought to determine the respondents' levels of knowledge of PPPs and the sectors in which PPPs have been implemented or being implemented in Zambia and elsewhere respectively. The levels of knowledge are critical to assist in determining to what extent the use of existing PPPs Model could increase effectiveness of dimensions of cost, time and quality in the Zambian Water and Sanitation Sector. It would also be important to note that the higher the levels of knowledge exhibited by the respondents on PPPs, the more reliable and valid the data to be provided will be. Figure 4.4 below indicates the levels of knowledge of PPPs whereas Figure 4.5 identifies the sectors in which PPPs have been implementation.

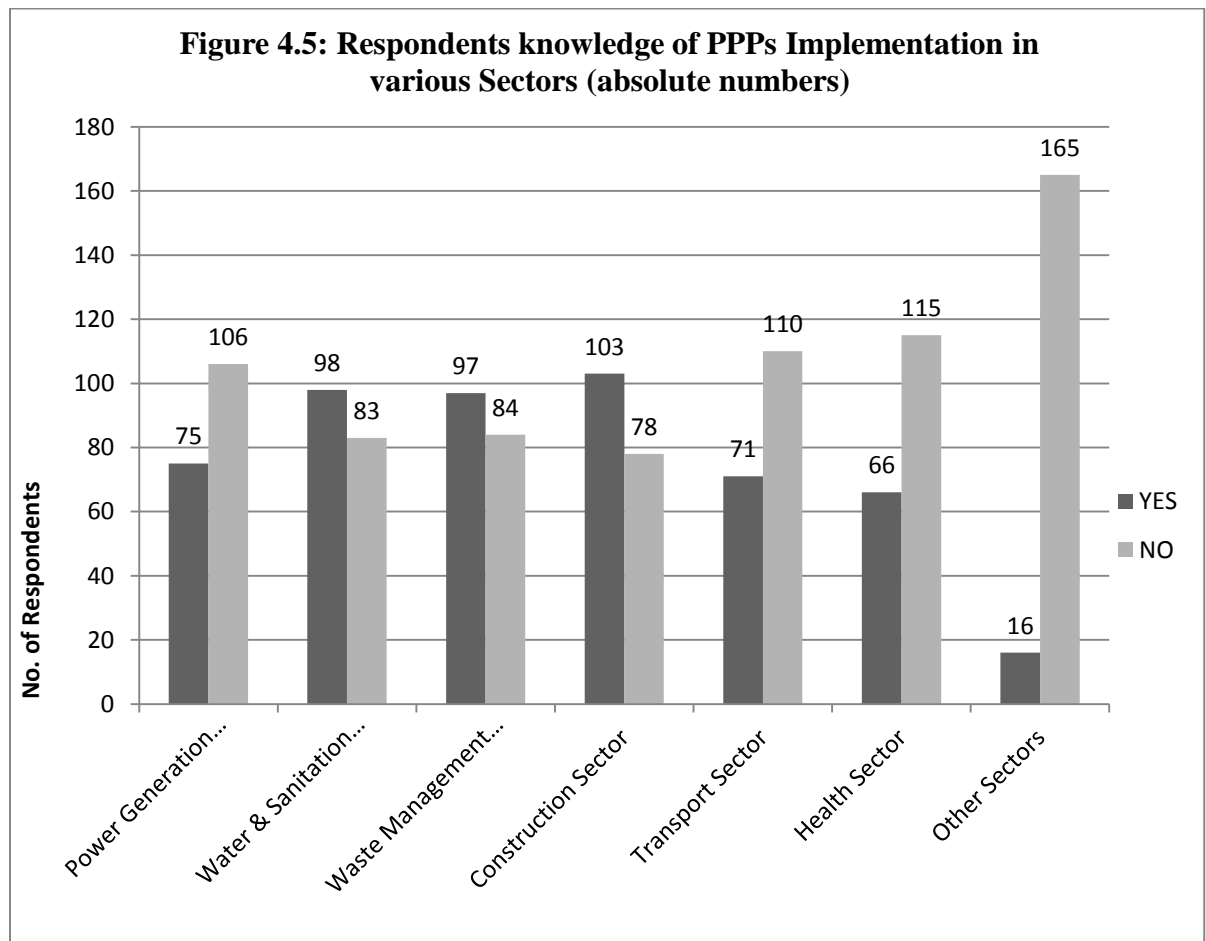


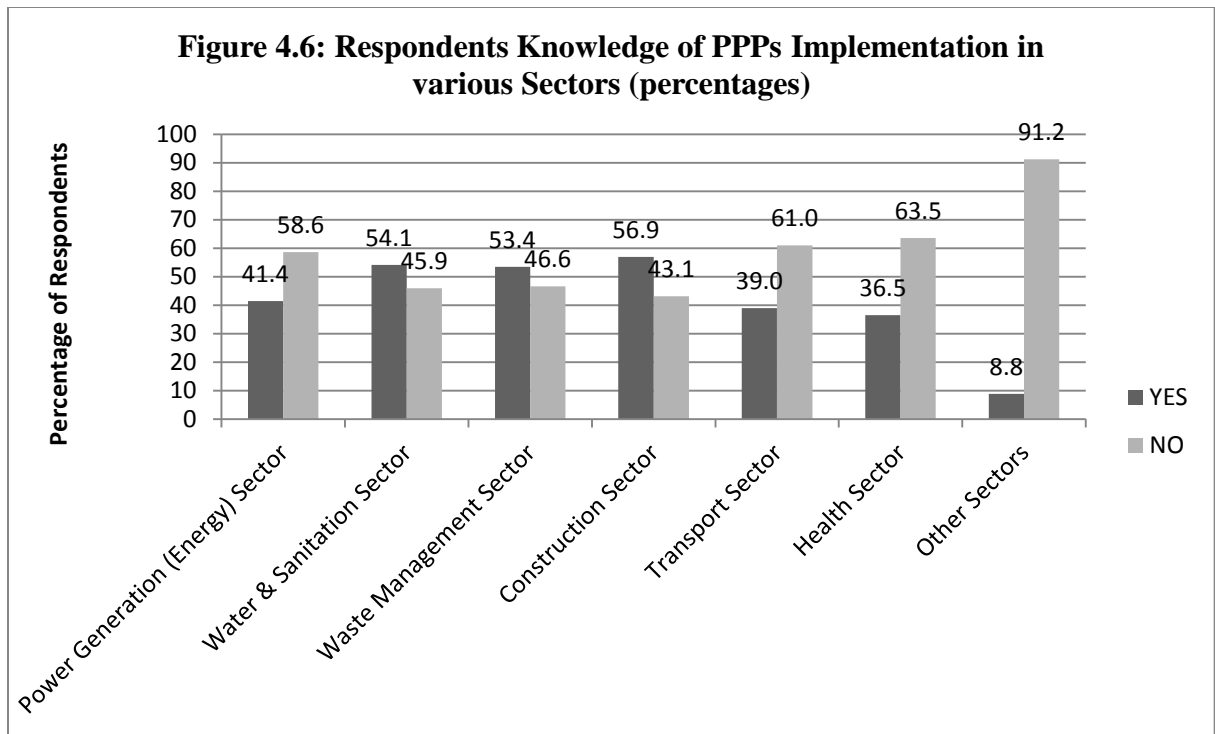
Based on Question B1, it is evident that at least 90.06 percent of the respondents have levels of knowledge ranging from average to sufficient (Sum of levels 5 to sufficient) with only 9.94 percent constituting those below average. Out of this, 71.72 percent have knowledge levels above average and 19.34 percent constitutes those with just average levels of knowledge. These levels of knowledge are considered sufficient in ensuring the validity and reliability of the subsequent data to be collected from respondents. Arising from the introductory (background) and literature review chapters, this research is premised on the foundation that at the moment, there are no PPPs in the water and sanitation sector in Zambia despite other sectors such as construction experiencing PPPs. These results therefore feed well into questions B2, B3 and Part C of the questionnaire that require the respondents' to exhibit sufficient levels of knowledge on PPPs for the purpose of ensuring the reliability and validity of the research results and conclusion.

Based on Question B2, respondents were asked to indicate whether they "agreed or disagreed" on which sectors PPPs have been and/or are being implemented in Zambia or elsewhere based on their levels of knowledge as in B1 above. The results vary considerably from sector to sector and are shown both in absolute and percentage terms (refer to Figures 4.5 and 4.6 below). The levels of knowledge of PPPs implementation in sectors of Water and Sanitation (54.1 percent), Waste Management (53.5 percent) and Construction (56.9 percent) are all above 50 percent and much higher than in sectors of Power Generation (41.4 percent), Transport (39.2 percent), Health (36.5 percent) and others (8.8 percent) all rated below 50 percent.

The highest levels of knowledge of PPPs implementation in the identified sectors are in construction pegged at 56.9 percent, whereas the lowest levels of knowledge are in other sectors pegged at 9.2 percent. Nonetheless, these results are indicative to the researcher that the respondents levels of knowledge of the existence of PPPs in the sectors in question are reasonable and a good starting point to knowing the types of PPP Models that would be considered suitable and their subsequent ranking for suitability. It is also evident from the results and as captured in the literature review chapter that PPPs in Zambia are developing and will possibly continue to do so especially in other sector that have recorded lower knowledge levels such as power generation, transport and health sectors.

The PPP Models used in the questionnaire were identified in the literature review and have been used in many developed and developing countries. The literature review covered sufficiently sectors in which PPPs have been or are being implemented across developed and developing countries. It is the view of the author that while PPPs are still a new and developing concept especially in developing countries like Zambia, the results are indicative of their existence in different sectors of the economy and construction being one of the preferred sectors that has benefited highly. This is also an indication that there is still much more that developing countries like Zambia could do possibly by ensuring that the investment potential in all the critical sectors of the economy is enhanced and as a way of encouraging growth.





Summary of Questions B1 and B2

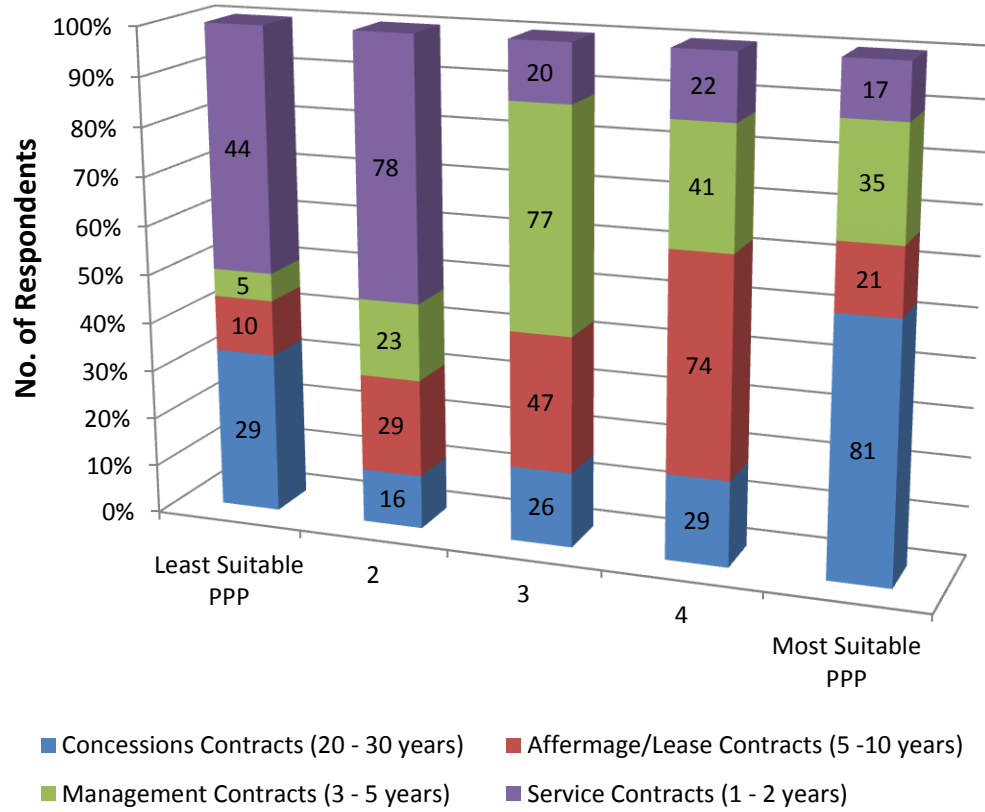
Arising from Questions B1 and B2 above, it is evident that respondents have sufficient levels of knowledge (90.0 percent) to ensure the reliability and validity of subsequent data to be collected from the rest of the questions B3 and Part C of the questionnaire. It is equally evident that respondents have acceptable levels of knowledge in sectors in which PPPs have been implemented in Zambia and/or elsewhere though results vary considerably from sector to sector. Respondents have more levels of knowledge of PPPs in sectors of water and sanitation, waste management and construction. These were rated above 50.0 percent with construction sector rated first with 56.9 percent. Sectors of power generation, transport, health and other sectors were rated below 50.0 percent of levels of PPP sector knowledge. “Other sector” low rating is based on many respondents not able to identify additional sectors other than those provided in the questionnaire thus indicating very low levels of knowledge. Nonetheless, the progressive results provide a good indication that PPPs are developing in Zambia despite having none in the water and sanitation sector.

Question B3

This question elicit from respondents the types of PPP Models that would be best suited in the Zambian Water and Sanitation Sector by ranking them in their order of suitability, “**1 as the least suitable and 5 as the most suitable**”. The PPP models included Concessions, Affermages/Lease, Management, Service and ‘Other’ to be stated. The most suitable PPP Model ranked by the respondent was to be used in the rating of various attributes on cost, time and quality dimensions in order to determine the extent to which the respective existing PPP Model could increase effectiveness of dimensions of cost, time and quality in the subsequent Part C of the questionnaire. For instance, for a particular respondent who had ranked Concessions as the most suitable PPP Model, it was used as a dependent factor to rate various attributes of cost, time and quality against it; similarly, if it was Service contract, it was used to rate various attributes of cost, time and quality against it etc. In this way, the overall model effectiveness would be deduced based on how each of the existing PPP Model could increase effectiveness of dimensions of cost, time and quality. The results for Part C of the questionnaire are analysed on page 140.

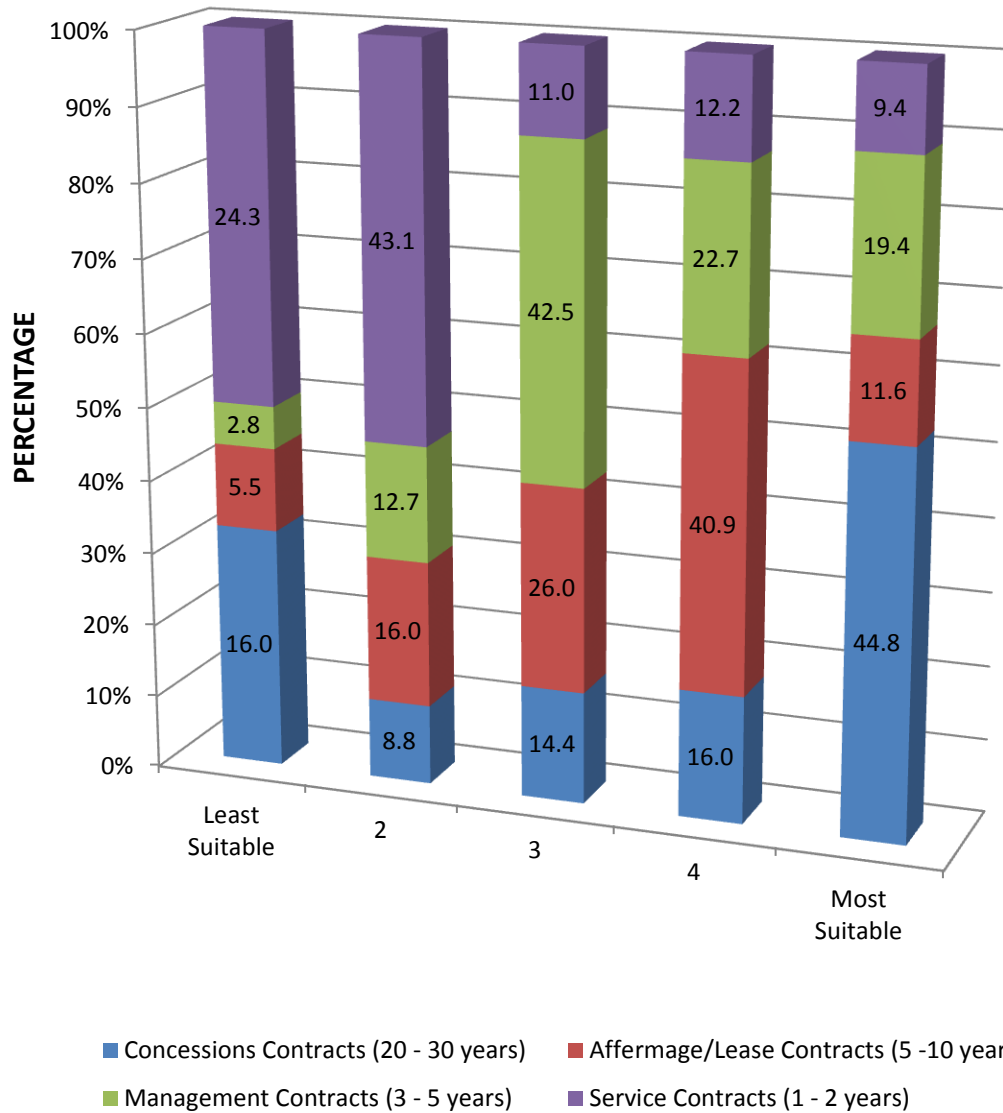
The PPP Models used in the ranking were identified in the literature review and are commonly used in both developed and developing countries, Zambia alike. However, and despite the questionnaire providing the respondents with an option to include any other PPP Model possibly known by them for rating purposes, none was provided. Figures 4.7 and 4.8 show how the results have been ranked both in absolute and percentage terms respectively based on the four (4) models.

Figure 4.7: Ranking of PPPs Model in order of their suitability in absolute numbers



Note: There were no “Other” PPP stated and ranked by the respondent as requested. The rankings were therefore done based on 4 models and each was ranked using an appropriate rank from the 5 choices.

**Figure 4.8: Ranking of PPPs Models in order of their suitability in percentage
(1 as Least suitable & 5 as the Most suitable)**



Note: There were no “Other” PPP stated and ranked by the respondent as requested. The rankings were therefore done based on 4 models and each was ranked using an appropriate rank from the 5 choices.

The results vary considerably according to the level of suitability, i.e. from the “**Least Suitable**” to the “**Most Suitable**” in the following manner.

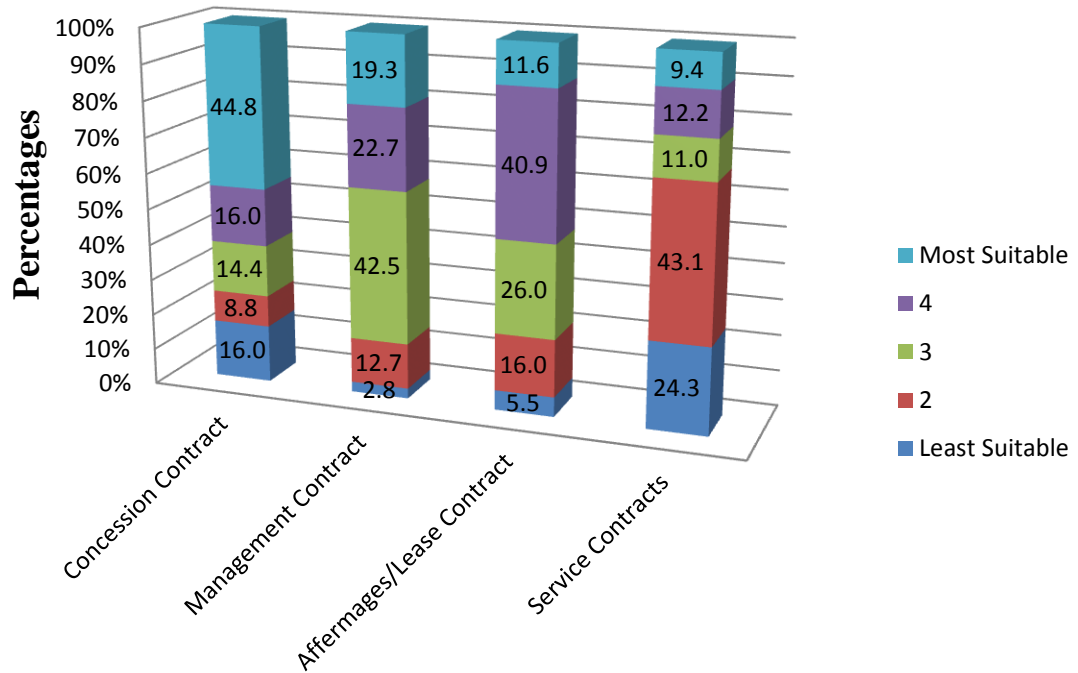
- At the Least Suitable Level, Service Contracts (1 – 2 years) are ranked higher than the rest with 44 respondents representing 24.3 percent as compared to Management Contracts (3 – 5 years) ranked lower with 5 respondents representing 2.8 percent respectively. This indicates that at this level of suitability, Service Contracts are much preferred to the rest. Nonetheless, Concession Contracts are ranked higher than Affermages/Lease Contracts with 16.0 and 5.5 percent respectively.
- At Level 2 of suitability, again Service Contracts (1 – 2 years) are ranked higher than the rest with 78 respondents representing 43.1 percent as compared to Management Contracts (3 – 5 years) ranked lower with 23 respondents representing 12.7 percent respectively. Again, this indicates that Service Contracts are much preferred to the rest at level 2. Nonetheless, at this level of suitability, Management Contracts and Affermages/Lease Contracts rankings have improved by 9.9 percent (12.7 – 2.8) and 10.5 percent (16.0 – 5.5) respectively whereas Concession Contracts preference has reduced by 7.2 percent (16.0 – 8.8).
- At Level 3 of suitability, Management Contracts (3 – 5 years) are ranked higher than the rest with 77 respondents representing 42.5 percent as compared to Service Contracts (1 – 2 years) ranked lower with 20 respondents representing 11 percent respectively. This has seen Service Contracts ranking to reduce drastically by 31.5 percent (42.5 – 11) from the previous level with improvements in Affermages/Lease and Concession Contracts ranking.
- At Level 4 of suitability, Affermages/Lease Contracts (5 – 10 years) are ranked higher than the rest with 74 respondents representing 40.9 percent as compared to Service Contracts (1 – 2 years) ranked lower with 22 respondents representing 12.2 percent respectively. Management Contracts have also fallen in ranking by 19.8 percent (42.5 – 22.2) in comparison with the previous level.

- At the Most Suitable Level, Concession Contracts (20 – 30 years) are ranked higher than the rest with 81 respondents representing 44.8 percent as compared to Service Contracts (1 – 2 years) ranked lower with 17 respondents representing 9.4 percent respectively. This has also seen Affermages Contracts to fall by a wider margin of 29.3 percent from the previous level pushing.

However, as part of the analysis and based on Figure 4.8 above, it must be noted that there were no ‘Other’ PPP Model indicated and ranked respectively by respondents. Respondents focus was more on the PPP Models that were provided in the questionnaire. It could therefore be observed that there is a percentage differential at each level of suitability. While the respondents were given a further option to include any other PPP Model other than the four options provided in the questionnaire, none was provided as “Others”. This created percentage differentials at each of the levels as a five scale rating was assumed. For instance, at most suitable, a total of 85.2 percent has been plotted leaving a differential of 14.8 percent that should have represented ‘Others’. Nonetheless, the overall behaviour and ranking trend of each PPP Model in line with the 5 levels of suitability are shown progressively as depicted in Figure 4.9 below and could be described as follows:

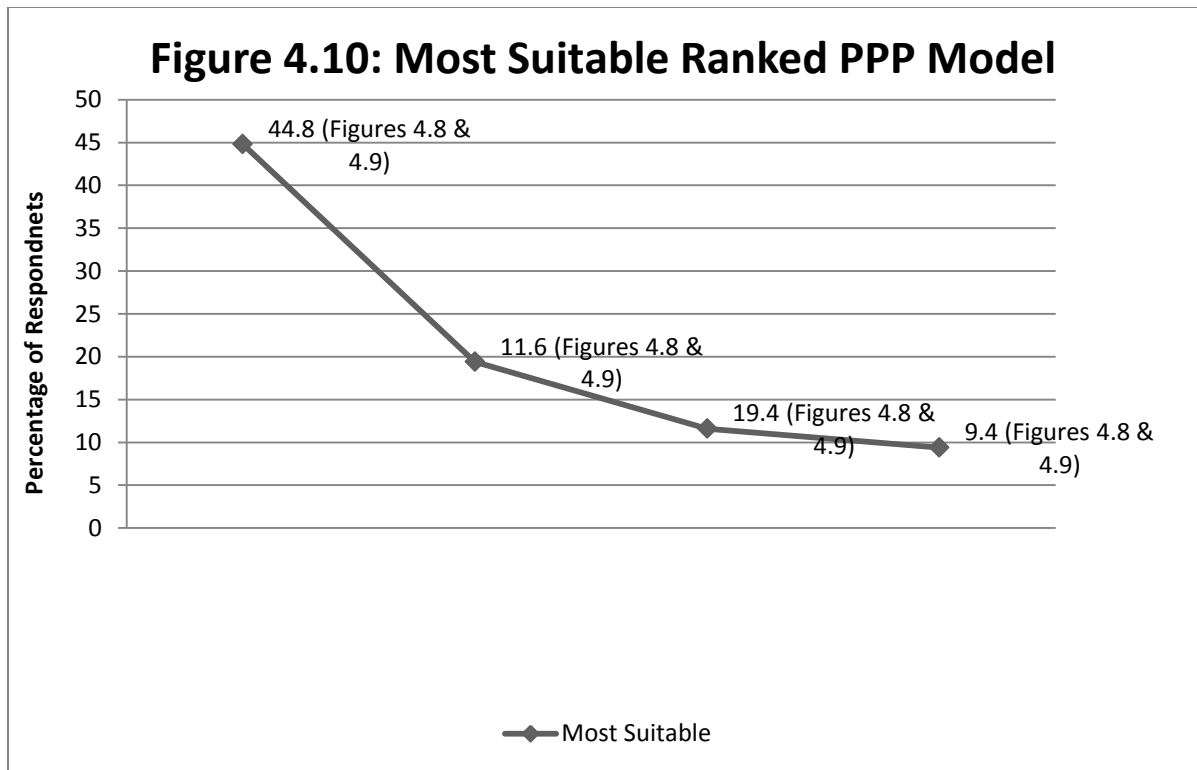
- Service Contracts ranking increased from 24.3 percent to 43.1 percent up to Level 2 before falling to an average of 19.6 percent $(11.0+12.2+9.4)/3$ at the last 3 Levels.
- Management Contracts continued improving from least suitable to Level 3 rising up to 42.5 percent before going down to an average of 21.0 percent $(22.7+19.4)/2$ at the last two levels.
- Affermages Contracts ranking continued improving from least suitable to Level 4 rising up to 40.9 percent before going down to as low as 11.6 percent at Level 5.
- Concession Contracts ranking continued improving to as high as 44.8 percent across all levels though it recorded a slight fall at Level 2 before rising again. It also represents the highest ranked PPP Model at the most suitable category.

Figure 4.9: Ranking Trends of each PPP Model in a progressive manner



4.2.3 The Most Suitable Ranked PPP Model.

As indicated above, the suitability rankings of PPP models were based on “**1 for the least suitable PPP Model and 5 for the most suitable PPP Model**”. In accordance with the scale, the most suitable ranked PPP Model should assume the rate of 5, followed by 4 in that order. Based on Figure 4.10 and as deduced from Figures 4.8 and 4.9, it is evident that Concession contracts (20- 30 years) are ranked as the most suitable PPP model with 81 respondents representing 44.8 percent. This is followed by Management Contracts (3 – 5 years) with 35 respondents representing 19.4 percent then followed by Affermages/Lease contract (5 – 10 years) with 21 respondents representing 11.6 percent and lastly Service contracts (1- 2 years) with 17 representing 9.4 percent. This is despite all ranked at below 50.0 percent by respondents as reflected in Figure 4.10 below.



The determination of the most suitable ranked PPP Model as depicted in Figures 4.9 and 4.10 is further looked at by using mean values. The mean values have been calculated based on the pattern of scoring by respondents. As in Table 4.2 below, it is evident that Concession contracts are still ranked as the most suitable PPP Model based on the mean value ranking position. In this case, the higher the ranking position, the higher the mean value and the most suitable the model is.

Table 4.2: Mean Values and Ranking Position for Most Suitable PPP Models

PPP Model	Mean	Ranking Position
Concession Contracts (20 – 30 years)	3.65	1
Management Contracts (3 – 5 years)	3.43	2
Affermages/Lease Contracts (5 – 10 years)	3.37	3
Service Contracts (1 -2 years)	2.49	4

It is evident from the above analysis and results that despite the variations in rankings, Concessions Contracts (20 – 30 years) are the most preferred overall based on both the most suitable ranked existing PPP Model, mean values and ranking position. This is likely to be followed by Management Contracts (5 – 10) though with a lower preference with the least being Service Contracts. The most suitable ranked existing PPP Model was arrived at by ranking them on the likert scale of 1 – 5 with 1 being the least and 5 being the most suitable respectively. On the other hand, the mean ranking positions were arrived at by weighting the scores from the least suitable to most suitable of each existing PPP Model in question. This indicates that each of the existing PPP Models has a reasonable level of suitability based on the mean value calculations. The PPP Models are used in Part C of the questionnaire in a bid to determine as to whether their use could increase effectiveness of dimensions of cost, time and quality.

It is the view of the author that the variations in terms of rankings could be as a result of respondents' perception on PPP Models and preferences in terms of their characteristics and/or arrangements. For instance, some respondents would prefer a lower duration to a higher one and vice versa. This is also supported by some merits and de-merits associated with some project investment appraisal techniques such as Pay – Back method, Net Present Value (NPV) method, Internal Rate of Return (IRR) method, Accounting Rate of Return (ARR) method among others. For instance, in a Pay – Back method, an individual investor would prefer an investment that has a shorter duration as opposed to a longer one. Such an investor is said to be risk averse based on the premise that investments with shorter durations are easier to forecast in terms of risk and expected return. The longer the period, the higher the risk and vice versa. Based on this premise, the author asserts that the shorter duration adduced to Service contracts could have motivated respondents to rank them higher as evidenced at least suitable and Level 2 of suitability respectively. Investors with this kind of preference also works on the premise that quicker returns based on a shorter period could be re-invested and generate more returns than expected from longer maturity periods. This is also normally the case when investments are made in developing countries that are normally considered not stable and risky especially from the political point of view. In other words, the uncertainty perceived by investors and said to surround the investments could to a larger extent determine the preference levels of investments.

On the other hand, other project investment appraisal techniques such as NPV, IRR and ARR are normally associated with longer durations in order to get a meaningful return as opposed to Pay-Back method. These kind of investors are risk takers as they believe that the higher the risk, the higher the return. Based on this premise, the researcher asserts that the longer durations adduced to Management, Affermages/Lease and Concessions contracts could have motivated respondents to ranking them higher at 3, 4 and most suitable levels based on the premise that longer investment could generate more returns than expected from short-term investments.

While these perceptions and preferences by the respondents' have not been tested in this research, thus constituting a limitation in this study, the researchers assertions are based on the theory of project investment appraisal techniques and economic theory in relation to what motivates individual investor to invest their capital in certain projects.

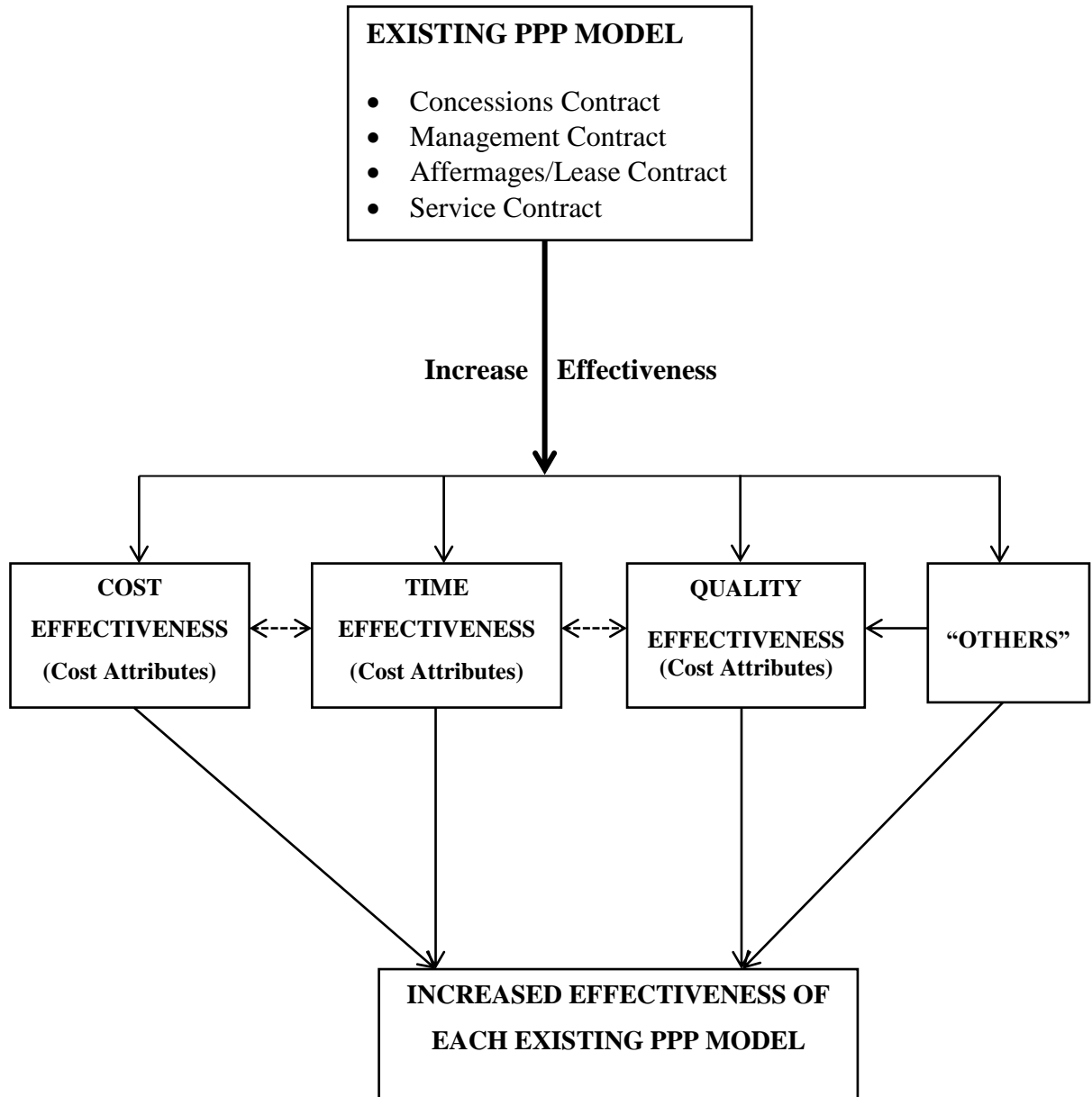
Below, a Propositional Model to be used in determining as to whether existing PPP Models could increase effectiveness of dimensions of cost, time and quality is proposed. This will be tested using the responses in Part C of the questionnaire.

4.2.4 Proposed Propositional Model of Increased Effectiveness

Arising from the literature review, questionnaire survey and the results on the most suitable ranked PPP Models, a Propositional Model depicting how increased effectiveness would be achieved has been proposed taking into account the existing Public – Private Partnership Models and dimensions of cost, time and quality. The Propositional Model is based on the premise that the existing PPP Model(s), the dependent factor (s), and as ranked by respondents, could increase effectiveness of dimensions of independent factors of cost, time and quality individually and/or put together. In other words, increased effectiveness would vary according to the impact arising from respective dimensions. The levels of impact are to be determined from the ratings in Part C of the questionnaire and subsequent determination of results by way of mean values. This should result into increased overall effectiveness of each existing PPP Model in question.

The proposed Propositional Model is depicted in Figure 4.11 below:

Figure 4.11: Proposed Propositional Model of increased effectiveness



The proposed Propositional Model of existing PPP Models for increased effectiveness has been deduced in Figure 4.11 above. The rationale behind the Model is that, the top box includes all the existing PPP Models used by respondents to rank for their suitability. The middle boxes depict the three independent dimensions of cost, time and quality and “others” (as captured from the respondents’ comments in the questionnaire) and as used to rate for increased effectiveness using dimensions attributes. The bottom box depicts the cumulative effective that is likely to arise once the analysis and results have been deduced. The arrows show the flow or direction of processes embedded in executing the proposition. In other words, the Propositional Model is used to determine how the existing PPP Models could increase effectiveness of dimensions of cost, time and quality independently and/or put together based on the synergistic effect that is likely to arise from each of them.

It could also be deduced from the model above that the key factor here is the determination of increased effectiveness (represented by each model) arising from the use of existing PPP Models. It is also expected that the combined efforts of dimensions of cost, time and quality will signify the kind of relationship that subsist amongst them yet to be verified as part of the semi-structured interviews. For instance, a lower cost would entail increased time and compromise on quality; lesser time would compromise the expected quality and increase the cost; higher quality would require more time and a higher cost. The relationship amongst the three factors will need to be managed properly in order to achieve the expected levels of effectiveness.

The proposed Propositional Model will act as radar to developing the Conceptual Alpha Model after taking into account the analysis, results and discussions in Part C of the questionnaire below.

4.2.5 Part C: Factors or Measures of PPP Models Effectiveness

This section sought to determine the extent to which the most suitable ranked existing PPP Model in B3 above could increase effectiveness of dimensions of cost, time and quality based on their respective attributes from the respondents’ point of view. In other words, the author sought to determine how the use of existing PPP Models could increase effectiveness of dimensions of cost, time and quality. The dimensions of cost, time and quality and their respective attributes relate to each of the existing PPP Models in question and in total. For

instance, all the cost, time and quality attributes identified relate to Concessions, Management, Affermages and Service contract respectively and independently. The outcome in terms of which existing PPP Model is more effective (able to achieve the set objective or results) than the other will be depended on their respective suitability as ranked in Question B3 above. The attributes were deduced from the literature review, and in particular from the water utilities and regulator's perspective and as used in the monitoring and evaluation of the same. The pilot study as indicated in the methodology chapter provided a platform on which the relevance of the criteria against which the respondents assessed time, cost and quality factors was weighted and therefore assisted in their perfection. It was therefore inevitable to assess the significance of these factors and as represented by their respective attributes.

The respondents' were asked to rate all attributes for each of the three dimensions in accordance with the appropriate level of significance, i.e. *Insignificant, Slightly Significant, Significant, Very Significant and Extremely Significant* based on scales 1 – 5. Based on the pilot study, the weights were therefore considered suitable. While Concessions contracts were ranked as the most suitable overall (as in question B3 above), Management contracts and Affermages contracts ranked second and third respectively and Service contracts ranked the least, all the four (4) existing PPP Models have been used to rate against respective dimensions of cost, time and quality to determine increased effectiveness. In other words, each of the existing PPP Models as ranked by a respective respondent as the most suitable has been used in this section to rate against respective attributes. Figures 4.7 – 4.10 clearly indicates that at least each of the existing PPP Model were scored at level 5 of suitability. This will act as a build up to establishing which existing PPP Model would be the most effective overall despite Concession contracts being ranked as the most suitable as in section 4.2.3 above. In this way, increased effectiveness of dimensions of cost, time and quality would be determined. An effective PPP Model is one that achieves the set objectives or results as defined in the glossary of terms (Appendix 1), in this case to increase the effectiveness of dimensions of cost, time and quality. The results from the responses have been presented separately for each of the three questions below representing each of the dimensions.

4.2.5.1 Existing PPP Models at Most Suitable level Rated for increased Cost Effectiveness using Cost Dimension.

Question C1

Respondents were asked to rate each cost attribute based on the level of significant scales (1 - 5) against the most suitable ranked existing PPP Model as in section 4.2.3 above considered to increase effectiveness of cost based on cost attributes. As indicated in paragraph 4.2.4, the ratings for increased effectiveness of cost relates to each of the existing PPP Models at most suitable level in B3 above representing dependent factors. The ratings have been presented in both absolute and percentage forms as in Table 4.3 and Figures 4.13A, 4.13B and 4.13C respectively below.

Table 4.3: Cost Attributes Presented According to their Level of Significance

Cost Attribute	Insignificant	Slightly significant	Significant	Very Significant	Extremely Significant
Maintain standard tariff levels	14.4	16.6	38.1	20.4	10.5
Solve the problem of public sector budget restraint	5.5	8.8	22.1	35.4	28.2
Enhance Government's capacity to fund other services	5.5	6.6	17.7	32.6	37.6
Reduce public money tied up in capital investment	9.9	15.5	29.8	24.3	20.4
Increased accessibility to water and sanitation	0	4.4	12.7	30.9	51.9
Facilitate creative and innovation approaches	1.7	9.9	19.9	37.0	31.5
Reduce project total cost	13.3	16.6	35.4	27.1	7.7
Save time in delivering the project	5.0	13.3	26.0	38.1	17.7
Transfer risk to the private partner	18.2	17.1	27.1	19.3	18.2
Reduce public sector administrative cost	4.4	12.2	21.5	35.9	26.0
Improved maintainability of infrastructure	2.2	4.4	13.8	40.3	39.2
Technological transfer to public sector	4.4	5.0	22.7	35.9	32.0
Accelerated project development	1.7	4.4	21.5	43.1	29.3
Higher project value earned	2.8	10.5	26.5	37.6	22.7
Low project life cycle cost	13.8	16.6	35.9	22.7	11.0
Improved financial viability	3.3	7.2	19.9	40.3	29.3
Increased affordability	11.0	18.2	30.4	24.9	15.5
Financial sustainability	2.8	8.3	21.0	44.8	23.2
Operational efficiency	0	3.3	12.2	45.9	38
Productive efficiency	1.7	1.7	11.6	43.1	41.4

Table 4.3 above indicates that the levels of significance vary according to respondents' perceptions on how each cost attribute increases the cost effectiveness. Taking into account all the cost attributes in Table 4.3 above and the pattern of ratings, ratings below significant fall between 3.0 and 36.0 percent. Those that are significant fall between 11.0 percent and 38.5 percent whereas those that are above significant fall between 30.0 percent and 85.0 percent.

In terms of individual ratings of each cost attribute, there is only one cost attribute that is rated above 50.0 percent (i.e. increased accessibility to water and sanitation) in the extremely significant level. Nonetheless, cost attributes of improved maintainability of infrastructure, accelerated project development, improved financial viability, financial sustainability, operational efficiency have been rated at least above 40.0 percent under very significant level whereas the cost attribute of production efficiency has been rated above 40.0 percent at very significant and extremely significant Levels respectively but below 50.0 percent. The bar charts in Figures 4.13A, 4.13B and 4.13C reflect the above scenario. Probably, the percentage rating for these could improve further if the response rate is increased to more than 60.33 percent on which this study has been based and/or the sample population increased to more than 300 used in this study.

In terms of overall ratings (sum of significant to extremely significant), it could be deduced that all the attributes could increase cost effectiveness considering that their ratings range between 64.0 percent and 97.0 percent. Nonetheless, at very significant and extremely significant levels only, 70.0 percent (14/20 rated above 50.0 percent) of the cost attributes are said to increase cost effectiveness. The cost attributes, have been reproduced in Table 4.4 below to include their mean values and ranking positions. The cost attributes have also been ranked according to the respondents' preference in Table 4.12 on page 164 below justified by their mean values in descending order of importance.

Based on the mean and ranking positions in Table 4.4 below, it is evident that the first four (4) cost attributes are critical in increasing cost effectiveness. Arising from the literature review, dilapidated infrastructure that requires to be maintained (ranked position 4) is among the many challenges noted that is associated with poor water supply and sanitation service provision not only in Zambia but among other developing and developed nations globally.

The infrastructure challenge in most cases has led to low levels of production and operational efficiency (ranked 2 and 3 respectively) and led to low levels of accessibility to water supply and sanitation (ranked position 1). This is in line with the information in the literature review indicating that commercial utilities have challenges at water reticulation, production, storage and distribution. Nonetheless, the rest of the 16 cost attributes are also important to increasing cost effectiveness at different levels as positioned by their mean values although maintain standard tariff levels has been ranked the least of all the 20 cost attributes possibly with a view that those who could afford should pay more than those who may not thereby avoiding a standard tariff.

In Figure 4.12 below, the mean values have also been plotted against ranking positions clearly showing that there is a negative linear correlation (negative slope) between the two variables as depicted by a line of best fit though with minor outliers especially for attributes 12, 13 and 17 that may need further investigations. The negative slope is an indication that the respondents' preference in terms of which cost attributes are considered more significant than others in terms of increasing cost effectiveness varies. The higher the ranking, the higher the preference and vice versa. For instance, increased accessibility to water and sanitation is highly preferred thus ranked first whereas maintain standard tariff levels is lowerly preferred thus ranked last. These results would be considered critical at the point of project planning and implementation in that a clear and well documented project schedule clearly showing which activities to implement first, concurrently, or lagged (i.e. activity sequencing) would be cardinal.

Table 4.4: Mean Values and Ranking Positions of Cost Attributes According to Contribution to Cost Effectiveness.

Cost Attribute	Mean Value	Ranking Position
Increased accessibility to water and sanitation	4.30	1
Productive efficiency	4.20	2
Operational efficiency	4.20	3
Improved maintainability of infrastructure	4.10	4
Accelerated project development	3.94	5
Enhance Government's capacity to fund other services	3.90	6
Facilitate creative and innovation approaches	3.87	7
Technological transfer to public sector	3.86	8
Improved financial viability	3.85	9
Financial sustainability	3.77	10
Solve the problem of public sector budget restraint	3.72	11
Reduce public sector administrative cost	3.67	12
Higher project value earned	3.67	13
Save time in delivering the project	3.50	14
Reduce public money tied up in capital investment	3.30	15
Increased affordability	3.15	16
Transfer risk to the private partner	3.02	17
Low project life cycle	3.01	18
Reduce project total cost	2.99	19
Maintain standard tariff levels	2.96	20

Figure 4.12: Ranking Positions Plotted against Mean Values as in Table 4.4 above

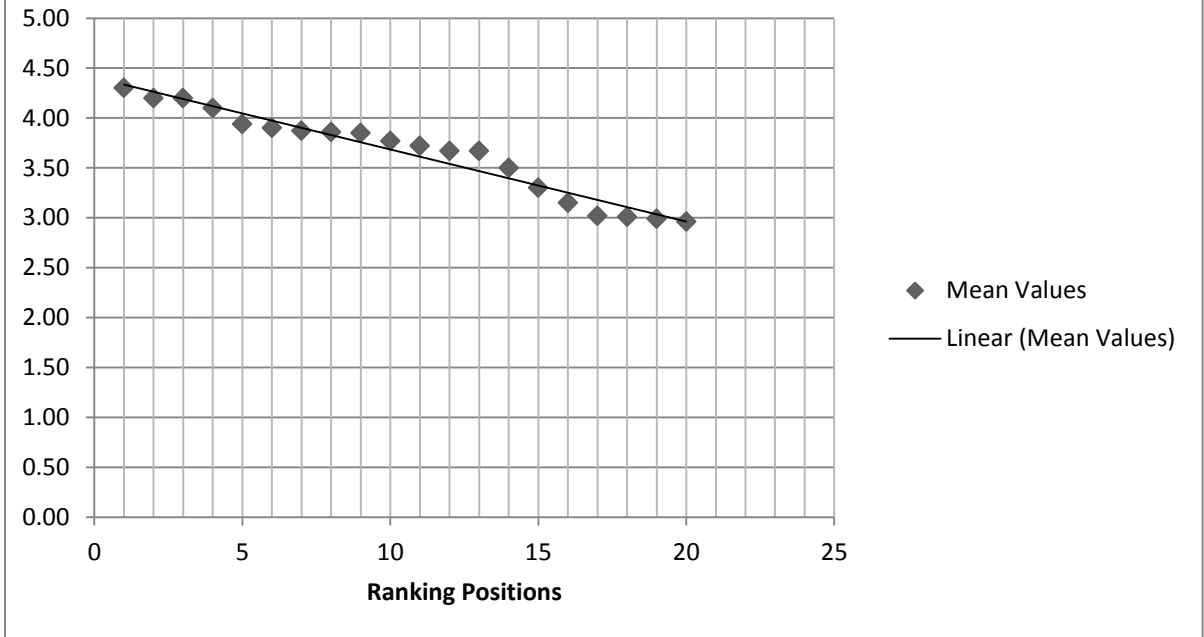


Figure 4.13A: Respondents Rating of each Cost Attribute (in percentages based on Table 4.3 above)

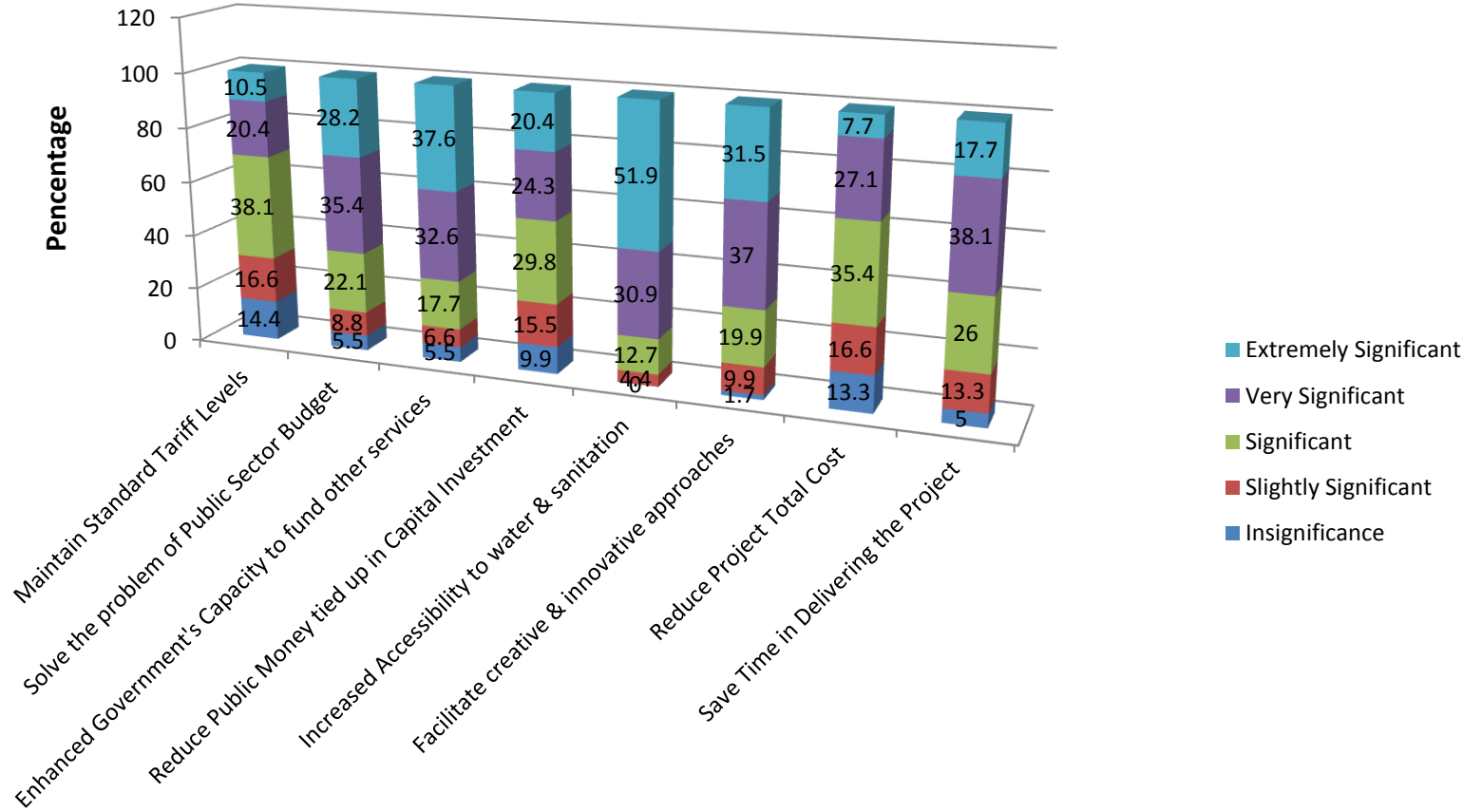


Figure 4.13B: Respondent Rating of each Cost Attribute (in percentage based on Table 4.3 above)

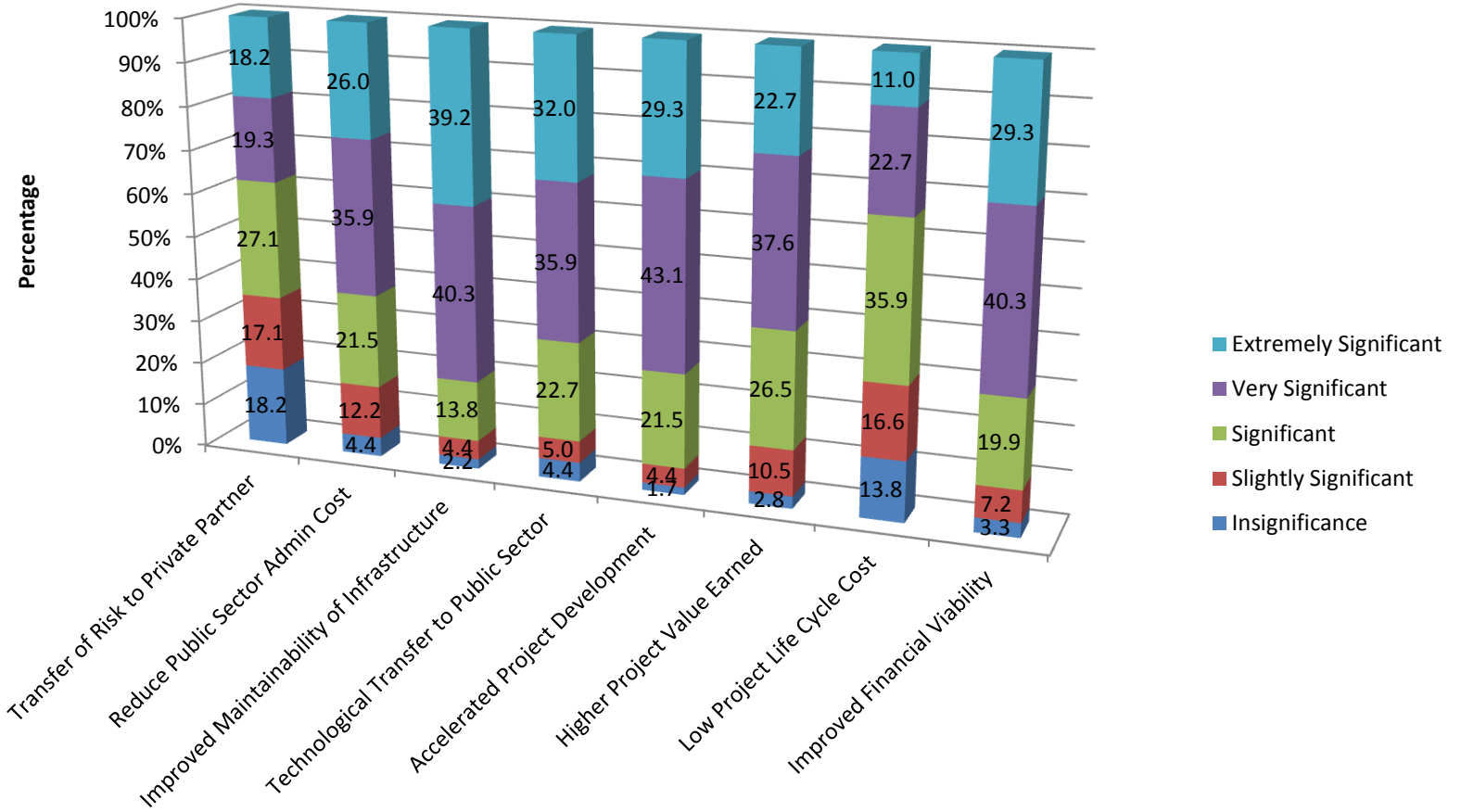
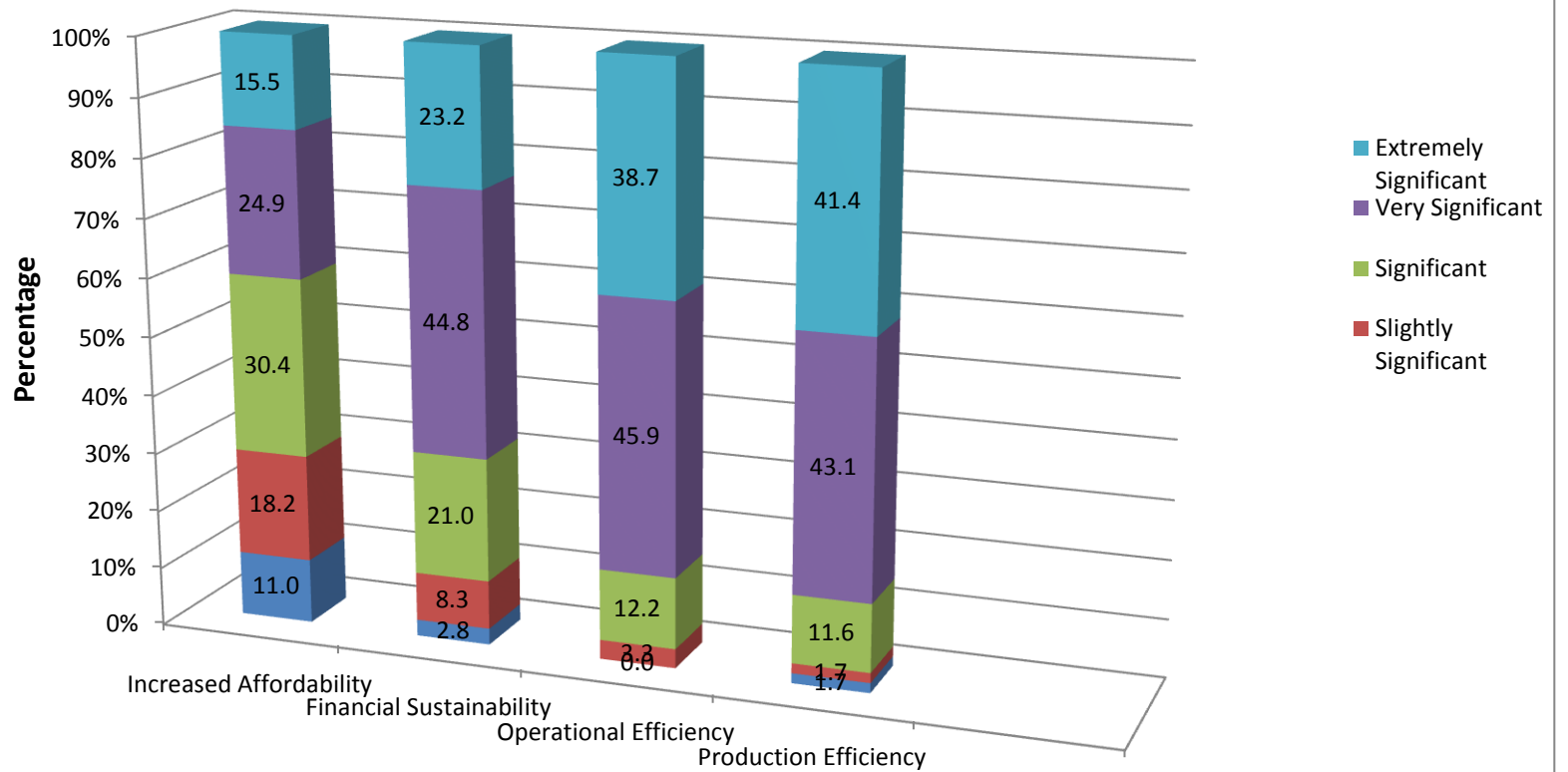


Figure 4.13C: Respondents Rating of each Cost Attribute (in percentage based on Table 4.3 above)



4.2.5.2 Existing PPP Models at Most Suitable level Rated for Increased Time Effectiveness using Time Dimension.

Question C2 asked respondents to rate each time attribute based on the level of significance against the most suitable ranked existing PPP Model as in section 4.2.3 above considered to increase time effectiveness based on time attributes. Again as indicated in paragraph 4.2.4 above, the ratings for increased time effectiveness relates to each of the existing PPP Models at most suitable level in B3 above as dependent factors. The ratings have been presented in tabular form, i.e. in Table 4.6 in absolute terms and Figure 4.15 in percentage terms.

Table 4.6 below indicates that the levels of significant vary according to how respondents' perceive each of the time attributes. Taking into account all the time attributes and the pattern of ratings, ratings between 3.0 and 9.5 percent fall below significant. Those that are significant and above fall between 89.0 and 96.5 percent. Those that are just significant fall between 13.0 and 43.5 percent whereas those that are above significant fall between 48.5 and 90.0 percent.

In terms of individual ratings of each time attribute, there is only one attribute that is rated above 50.0 percent, i.e. increased accessibility in terms of hours of continuous water supply) in the extremely significant level category. Nonetheless, time attributes of improved activity duration estimate at significant level; improved activity definition, improved project schedule development, improved activity resource estimating and improved project schedule control at very significant level; and improved billing efficiency at extremely significant level have been rated at least above 40.0 percent but below 50 percent. The bar chart in Figures 4.15 reflects the above scenario. Again as in paragraph 4.2.4.1 above on cost attributes, probably the percentage ratings for those rated between 40 – 50 percent could improve further if the response rate is increased to more than 60.33 percent on which this study has been based and/or the sample population increased to more than 300 respondents used in this study.

In terms of overall ratings, (Sum of Significant to Extremely Significant), it is evident that all the attributes could increase time effectiveness as their ratings fall between 89.0 and 96.5 percent. Nonetheless, at very significant and extremely significant levels only, time attributes are said to increase time effectiveness by 90.0 percent (9/10 rated above 50.0

percent). The time attributes have been reproduced in Table 4.5 below to include their mean values and ranking positions.

Based on the mean and ranking position in Table 4.5, it is evident that the first three (3) time attributes are critical in increasing time effectiveness. Arising from the literature review, some of the factors adduced to poor water supply and sanitation services are reduced access to continuous water supply, inefficiencies in billings and lack of effectiveness and efficiency when it comes to response time to customer complaints, request for meters and new connections among others. This has resulted in increased customer complaints, customer inability to settle bills in good time and illegal connections. This has also contributed to lower financial turnover and increased unaccounted for water due to the commercial utility companies' non-responsiveness to customer demands. Increased accessibility in terms of hours of continuous water supply, improved billing efficiency and response time to customer complaints have therefore been ranked in positions 1, 2 and 3 respectively based on their mean values. Nonetheless, and based on the ratings, the rest of the 7 time attributes are also important to increasing time effectiveness with improved activity duration estimating ranked the least of all.

In Figure 4.14 below, the mean values have also been plotted against ranking positions clearly showing that there is a negative linear correlation between the two variables as depicted by a line of best fit though with a minor outlier for attribute 4. The negative slope is an indication that the preference of the respondents in terms of which time attributes are considered more significant than others in terms of increasing time effectiveness varies. The higher the ranking, the higher the preference and vice versa. For instance, increased accessibility in terms of hours of continuous water supply is highly preferred thus ranked first whereas improved activity duration estimating is lowerly preferred thus ranked last. Similarly, like for cost attributes, these results would make project scheduling and implementation easier.

Table 4.5: Mean Values and Ranking Positions of Time Attributes According to Contribution to Time Effectiveness.

Time Attribute	Mean Value	Ranking position
Increased accessibility in terms of hours of continuous water supply	4.29	1
Improved billing efficiency	4.19	2
Response time to customer complaints, request for meters and new connections	4.08	3
Improved project schedule control	3.78	4
Quick amelioration of sewer blockage	3.78	5
Improved project schedule development	3.74	6
Improved activity resource estimating	3.64	7
Improved activity sequencing	3.59	8
Improved activity definition	3.55	9
Improved activity duration estimating	3.51	10

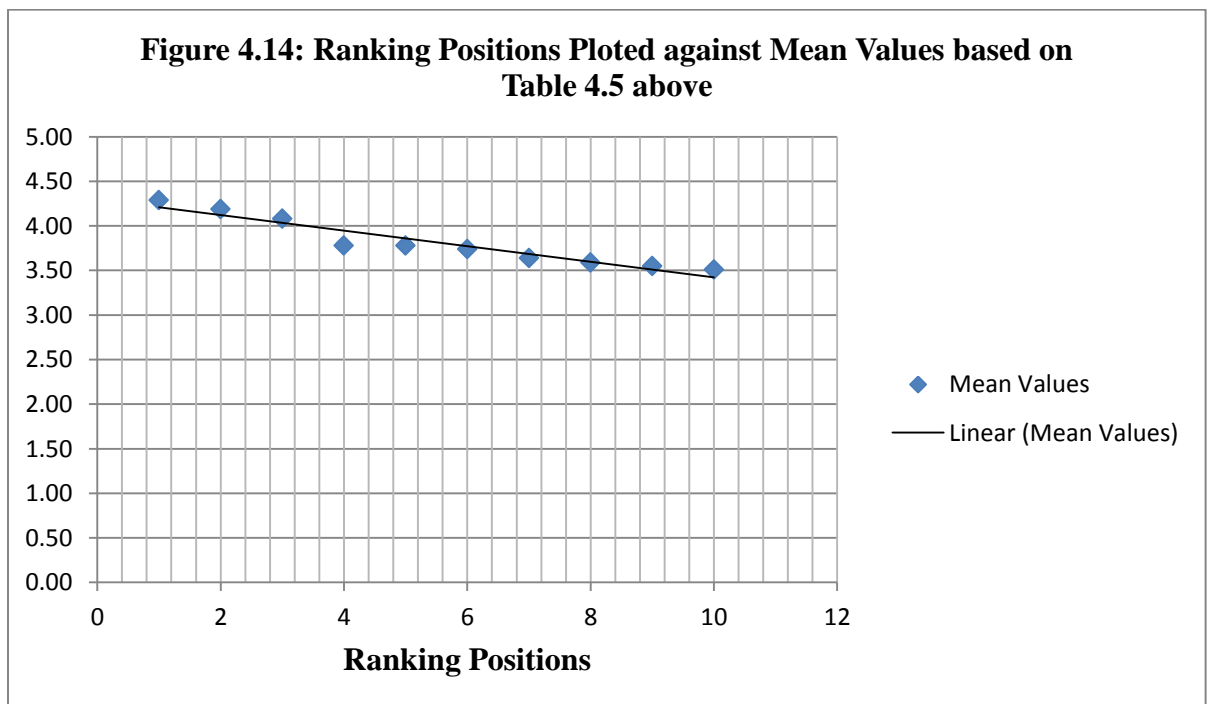
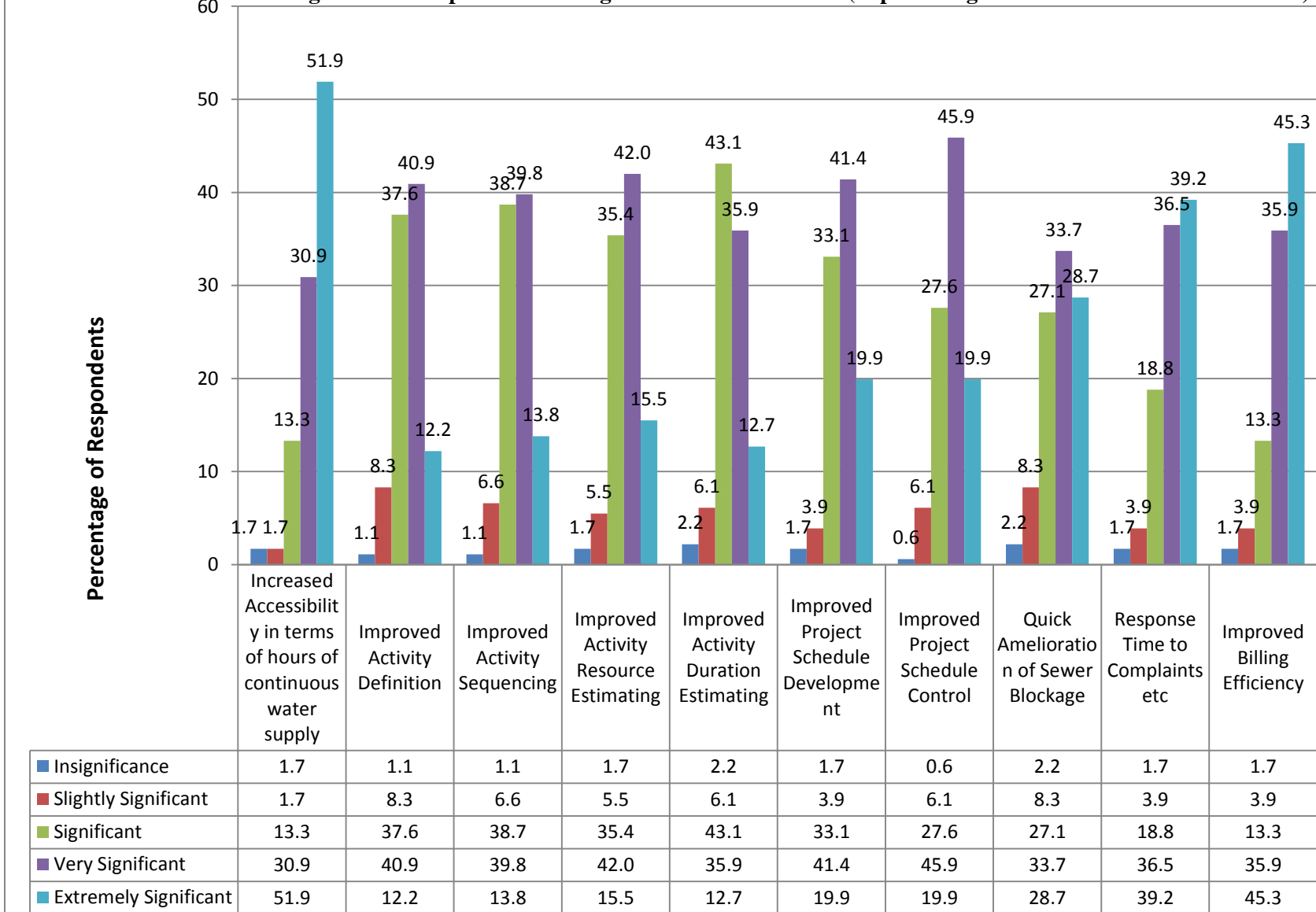


Table 4.6: Time Attributes Presented According to their Level of Significant

Time Attribute	Insignificant	Slightly significant	Significant	Very Significant	Extremely Significant
Increased accessibility in terms of hours of continuous water supply	1.7	1.7	13.3	30.9	51.9
Improved activity definition	1.1	8.3	37.6	40.9	12.2
Improved activity sequencing	1.1	6.6	38.7	39.8	13.8
Improved activity resource estimating	1.7	5.5	35.4	42.0	15.5
Improved activity duration estimating	2.2	6.1	43.1	35.9	12.7
Improved project schedule development	1.1	3.9	33.1	41.4	19.9
Improved project schedule control	0.6	6.1	27.6	45.9	19.9
Quick amelioration of sewer blockage	2.2	8.3	27.1	33.7	28.7
Response time to customer complaints, request for meters and new connections	1.7	3.9	18.8	36.5	39.2
Improved billing efficiency	1.7	3.9	13.3	35.9	45.3

Figure 4.15: Respondents Rating of each Time Attribute (in percentage terms based on Table 4.6 above)



4.2.5.3 Existing PPP Models at Most Suitable level Rated for Increased Quality Effectiveness using Quality dimension.

Question C3 asked respondents to rate each quality attribute against the most suitable ranked existing PPP Model based on time attributes as in section 4.2.3 considered to increase quality effectiveness. The ratings have been presented in tabular form in Table 4.8 and Figure 4.17 based on percentages.

Table 4.8 below indicates that the levels of significant vary according to how respondents' perceive each of the quality attributes. Taking into account all the quality attributes and the pattern of ratings, ratings between 3.0 and 14.0 percent fall below significant. Those that are significant and above fall between 86.0 and 100.0 percent. Those that are just significant fall between 13.0 and 32.5 percent whereas those that are above significant fall between 55.5 and 83.0 percent.

In terms of individual ratings of each quality attribute, there is only one attribute that is rated above 50.0 percent, i.e. reliability of service provision in the very significant level category. Nonetheless, quality attributes of increased customer service quality, increased project functionality, quality systems output, quality performance or reduced error rate and sufficient pressure in order to meet the customer demand at very significant level; access to safe-piped drinking water and access to improved sanitation services at extremely significant level have been rated at least above 40.0 percent but below 50.0 percent. The bar chart in Figures 4.17 reflects the above scenario. Similarly, as for cost attributes, there is a likelihood that the percentage rating for those rated between 40 – 50 percent could improve further if the response rate is increased to more than 60.33 percent on which this study has been based and/or the sample population increased to more than 300 respondents used in this study.

In terms of overall ratings, (Sum of Significant, Very Significant and Extremely Significant), it is evident that all the attributes could increase quality effectiveness as their ratings fall between 86.0 and 100.0 percent. Nonetheless, unlike the case for cost and time attributes considered above, all quality attributes as set in the questionnaire are said to increase quality effectiveness at 100 percent at significant and above significant levels. The quality attributes have been reproduced in Table 4.7 below to include the mean values and ranking positions.

Based on the mean and ranking position in Table 4.7, and while all the attributes have been rated highly, it is evident that the first four quality attributes are critical in increasing quality effectiveness. Arising from the introductory chapter (Background) and literature review, some of the factors adduced to poor quality services are those that relate to lack of access to safe drinking water, improved sanitation services and reliability of service provision among others. Lack of safe drinking water has the potential to bring about diseases such as diarrhoea and typhoid mostly prominent in developing countries. Sewerage blockages have contributed to poor sanitation. Together, these factors have contributed greatly to low revenue (turnover) and increased Non-Revenue Water (NRW) due to the commercial utility companies' non-responsiveness to the expected customer demands. Therefore, access to safe – piped drinking water, access to improved sanitation services, reliability of service provision and increased customer service quality have been ranked in positions 1, 2, 3 and 4 respectively based on their mean values. Nonetheless, the rest of the attributes are also important to increasing quality effectiveness.

In Figure 4.16 below, the mean values have also been plotted against ranking positions clearly showing that there is a negative linear correlation between the two variables as depicted by a line of best fit though with a few minor outliers. The negative slope is an indication that the preference of the respondents in terms of which quality attributes are considered more significant than others in terms of increasing quality effectiveness varies. The higher the ranking, the higher the preference and vice versa. For instance, access to safe-piped drinking water is highly preferred thus ranked first whereas increased training of staff is lowerly preferred thus ranked last. Similarly, like for cost and time attributes, these results would make project scheduling and implementation easier.

Table 4.7: Mean Values and Ranking Positions of Quality Attributes According to Contribution to Quality Effectiveness.

Quality Attribute	Mean Value	Ranking position
Access to safe – piped drinking water	4.25	1
Access to improved sanitation services	4.13	2
Reliability of service provision	4.09	3
Increased customer service quality	4.09	4
Quality systems output	3.90	5
Increased project functionality	3.86	6
Sufficient pressure in order to meet the customer demand	3.77	7
Increased office and front line service	3.69	8
Quality performance or reduced error rate	3.67	9
Increased training of staff	3.59	10

Figure 4.16: Ranking Positions Ploted against Mean Values based on Table 4.7 above.

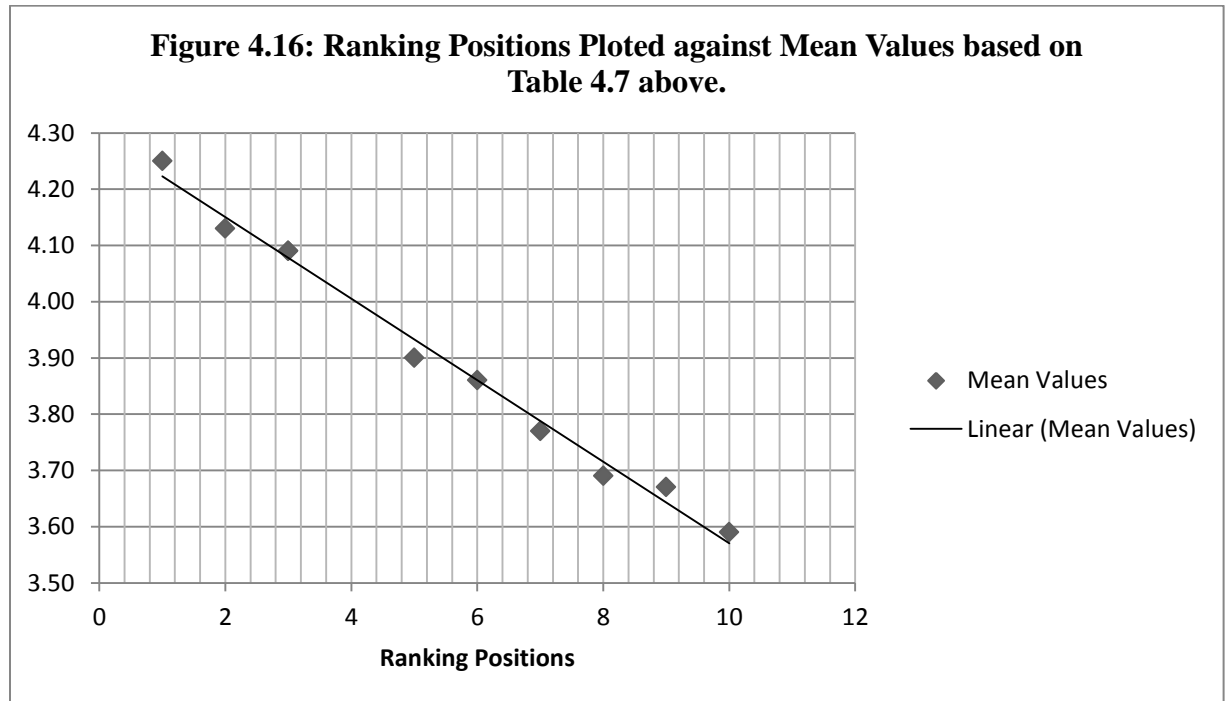
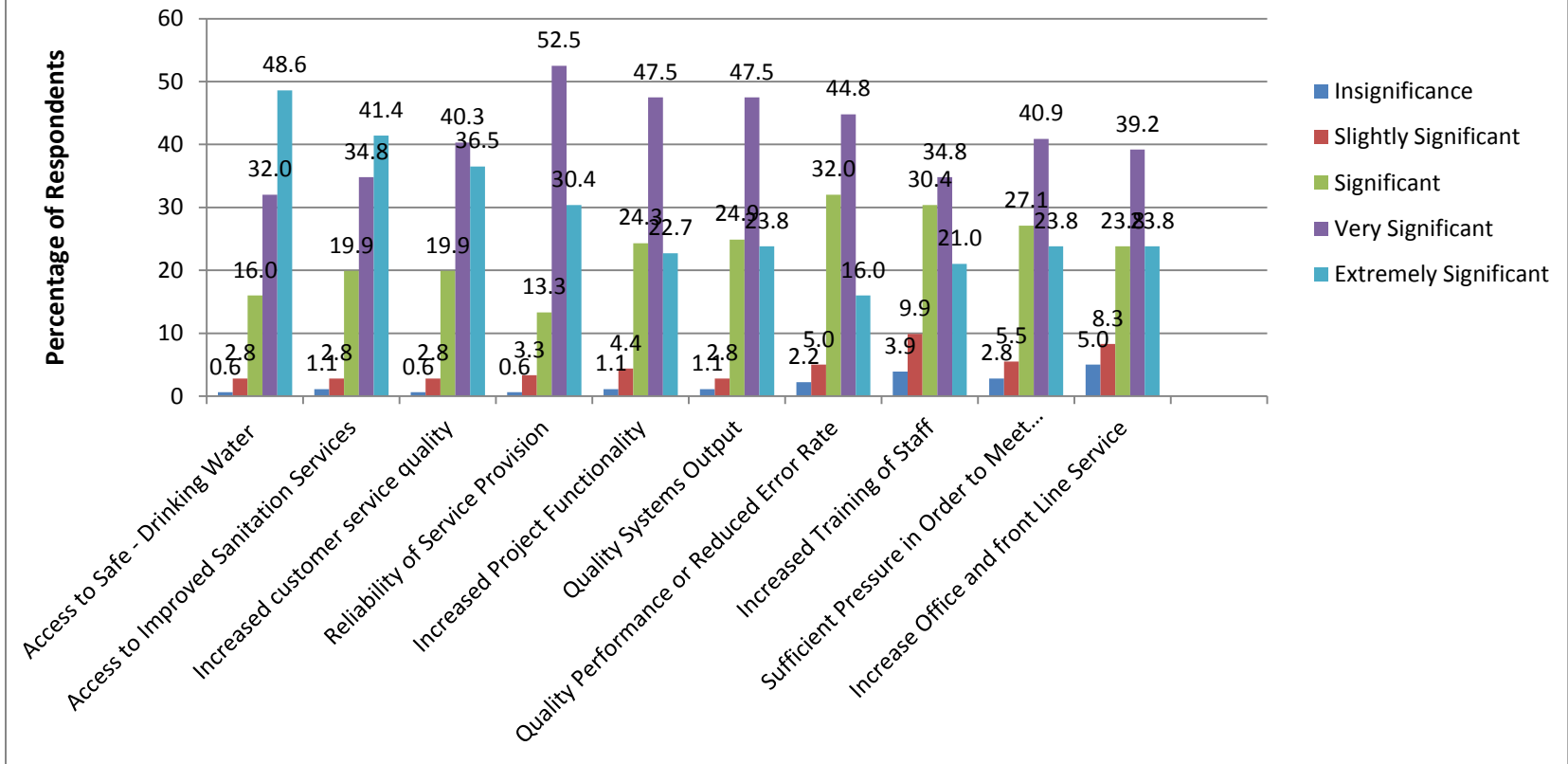


Table 4.8: Quality Attributes Presented According to their Level of Significant

Quality Attribute	Insignificant	Slightly significant	Significant	Very Significant	Extremely Significant
Access to safe – piped drinking water	0.6	2.8	16.0	32.0	48.6
Access to improved sanitation services	1.1	2.8	19.9	34.8	41.4
Increased customer service quality	0.6	2.8	19.9	40.3	36.5
Reliability of service provision	0.6	3.3	13.3	52.5	30.4
Increased project functionality	1.1	4.4	24.3	47.5	22.7
Quality systems output	1.1	2.8	24.9	47.5	23.8
Quality performance or reduced error rate	2.2	5.0	32.0	44.8	16.0
Increased training of staff	3.9	9.9	30.4	34.8	21.0
Sufficient pressure in order to meet the customer demand	2.8	5.5	27.1	40.9	23.8
Increased office and front line service	5.0	8.3	23.8	39.2	23.8

Figure 4.17: Respondents Rating of each Quality Attribute (in percentage terms based on Table 4.8 above)



4.2.5.4 Part C Summary

Part C of the questionnaire has clearly demonstrated how cost, time and quality attributes (representing their respective dimensions) are used in determining increase effectiveness of existing PPP Models from the respondents' point of view. The results obtained will in turn assist in determining the extent to which the existing PPP Models as determined in Part B of the questionnaire could increase effectiveness of dimensions of cost, time and quality based on the impact. The results were achieved through the rating of each attribute based on suitable levels of significant using scales 1-5.

While the ratings vary from one attribute to the other and dimensions to dimension, it is evident from the results that all the attributes are likely to increase their respective dimension effectiveness based on the sum of significant, very significant and extremely significant levels as their ratings are all above 50 percent. However, and based on likert scales, various mean values have been calculated and ranked in a bid to show the overall picture. The mean values and ranking positions therefore show a clear indication of the respondents' preference in terms of which attributes would increase effectiveness more than the others. The mean values and their respective positions have also been plotted against each other and the plots clearly indicate a linear best fit line with a few outliers that may need to be investigated in future. These results will feed into the determination of the Conceptual Alpha Model in section 4.3 below and in line with the set research proposition.

4.2.6 Part D: Respondents further Comments.

This section required respondents to provide comments and/or suggestion they wished to make (if any) on how existing PPP Models could increase effectiveness in the Zambian Water and Sanitation Sector. About 49.17 per cent (89/181) of the respondents were able to provide comments on this part of the questionnaire out of which 46 different comments/suggestions were identified and tarried based on their frequency of occurrence. Seventeen (17) suggestions were eliminated as they already formed part of the attributes captured in Part C of the Questionnaire. In this way, duplication of the same attributes was avoided. Out of the remaining 29 (46 – 17) suggestions, only 20.69 percent (6/29) were associated to at least 3 respondents in accordance with the tarry. All attributes tarried below 3 by the respondents have been ignored based on the assumption that they are not significant

or not representative enough. Those considered to be representative were further exposed to experts in the sector as part of verification during the interview survey. Figure 4.18 and Table 4.9 below refer.

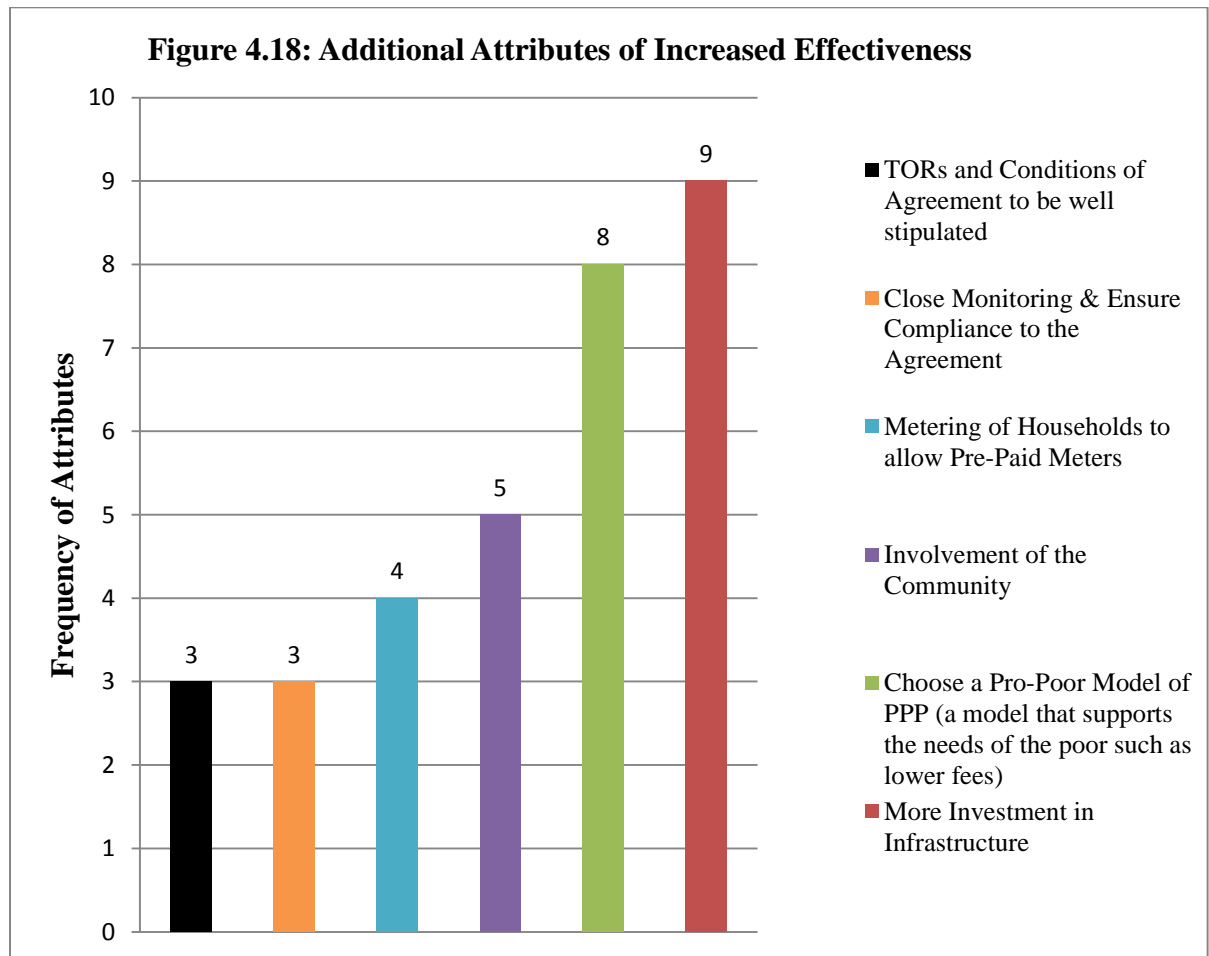


Table 4.9: Additional suggestions provided by respondents on increase effectiveness.

SUMMARY COMMENT/SUGGESTION	FREQUENCY OF OCCURRENCE										TOTAL
	1	2	3	4	5	6	7	8	9	10	
Zero-rate all ZESCO Taxes on water.	1	-	-	-	-	-	-	-	-	-	1
By focusing more on service provision with social implications other than economic benefits.	1	-	-	-	-	-	-	-	-	-	1
Terms of reference and conditions of agreement to be well stipulated.	1	1	1	-	-	-	-	-	-	-	3
Bring on board the community for more VFM	1	1	1	1	1	-	-	-	-	-	5
PPPs to only apply to connections and distributions.	1	-	-	-	-	-	-	-	-	-	1
Improved partnership with Local authorities	1	1	-	-	-	-	-	-	-	-	2
More investments in infrastructure	1	1	1	1	1	1	1	1	1	1	9
Improved quality of life.	1	-	-	-	-	-	-	-	-	-	1
To be implemented in the Peri-Urban.	1	-	-	-	-	-	-	-	-	-	1
More private sector involvement.	1	-	-	-	-	-	-	-	-	-	1
Metering to allow Pre-paid meters should be used.	1	1	1	1	-	-	-	-	-	-	4
Effective monitoring of funds.	1	1	-	-	-	-	-	-	-	-	2
Close monitoring and ensure compliance to the agreement is adhered to.	1	1	1	-	-	-	-	-	-	-	3
Classification of roles and spheres of influence between policy makers, administration and service operators.	1	1	-	-	-	-	-	-	-	-	2
Change in the mindset of customers and employees (work culture).	1	1	-	-	-	-	-	-	-	-	2
Reduced political influence.	1	-	-	-	-	-	-	-	-	-	1
Enhanced planning.	1	-	-	-	-	-	-	-	-	-	1
Improved labour efficiency.	1	-	-	-	-	-	-	-	-	-	1
Minimise on profit motive.	1	1	-	-	-	-	-	-	-	-	2
Choose a pro-poor model of PPP.	1	1	1	1	1	1	1	1	1	-	8
Separate water from sanitation.	1	-	-	-	-	-	-	-	-	-	1
Minimise costs by avoiding luxury cars.	1	-	-	-	-	-	-	-	-	-	1
Minimised bureaucracy amongst partners.	1	-	-	-	-	-	-	-	-	-	1
Planning and budgeting is made easier.	1	-	-	-	-	-	-	-	-	-	1
Reduced capital flights.	1	-	-	-	-	-	-	-	-	-	1
Sufficient sensitisation on PPPs.	1	-	-	-	-	-	-	-	-	-	1
Board members to be appointed on merit.	1	-	-	-	-	-	-	-	-	-	1
Performance assessment.	1	-	-	-	-	-	-	-	-	-	1
Increased provider and customer interface.	1	-	-	-	-	-	-	-	-	-	1

Based on Figure 4.18, it is evident that putting more investments in infrastructure as a higher frequency of occurrence followed by the need to choose a pro-poor model of PPP (a model that supports the needs of the poor such as lower user fees) and then involvement of the community. These among others were further tested as part of the semi-structured interview to be conducted in the second phase of the research.

In the next paragraph, and based on the proposed Propositional Model in section 4.2.4 above, a Conceptual Alpha Model for increased effectiveness is developed.

4.3 Development of Conceptual Alpha Model for Increased Effectiveness.

Arising from the Propositional Model in paragraph 4.2.4 above and as presented in Figure 4.11, and the analysis and results from Part C of the questionnaire, a Conceptual Alpha Model has been developed. The Conceptual Alpha Model provides additional information by aligning the various attributes that increases each of the dimensions to the dimension itself. For instance, attributes of cost to the cost dimension, attributes of time to the time dimension and those of quality to the quality dimension and then “others”. The attributes adduced to the cost, time and quality dimensions and as deduced from the literature review are used as measures to determine the operational performance of the water utilities in terms of effectiveness and efficiency and also from the regulator’s perspective, for monitoring and evaluation purposes. The attributes were used in the questionnaire survey, investigated, ranked and found to increase effectiveness of their respective dimension at different levels as per mean value ranking positions. Paragraph 4.2.5 above refers. As indicated in the methodology chapter, and as part of the questionnaire survey, the attributes were exposed, pre-tested and changes made during the pilot study. As a build up to developing a Conceptual Alpha Model, the dimensions and respective attributes are restated in Table 4.10 below in order of their preference based on their mean value ranking positions categorised as High, Medium and Low preference as captured from Tables 4.4, 4.5 and 4.7 above. Nonetheless, increased effectiveness may be achieved by mixing some attributes in these categories based on resource availability and ease of implementation.

Table 4.10: Factors, their respective attributes and Mean Value Ranking (as in section 4.2.5 above)

Factor	Factor Attributes	Mean Value Ranking
Cost (Tables 4.3, 4.4)	<ol style="list-style-type: none"> 1. Increased accessibility to water and sanitation 2. Productive efficiency 3. Operational efficiency 4. Improved maintainability of infrastructure 	High (1 – 4)
	<ol style="list-style-type: none"> 5. Accelerated project development 6. Enhance Government’s capacity to fund other services 7. Facilitate creative and innovation approaches 8. Technological transfer to public sector 9. Improved financial viability 10. Financial sustainability 11. Solve the problem of public sector budget 12. Reduced public sector administrative cost 13. Higher project value earned 14. Save time in delivering the project 15. Reduce public money tied up in capital investment 16. Increased affordability 17. Transfer risk to the private partner 18. Low project life cycle 	Medium (5 -18)
	<ol style="list-style-type: none"> 19. Reduce project total cost 20. Maintain standard tariff levels 	Low (19 – 20)
Time (Tables 4.5, 4.6)	<ol style="list-style-type: none"> 1. Increased accessibility in terms of hours of continuous water supply 2. Improved billing efficiency 3. Response time to customer complaints, request for meters and new connections 	High (1 – 3)
	<ol style="list-style-type: none"> 4. Improved project schedule control 5. Quick amelioration of sewer blockage 6. Improved project schedule development 7. Improved activity resource estimating 8. Improved activity sequencing 9. Improved activity definition 10. Improved activity duration estimation 	Medium (4 – 10)
Quality (Tables 4.7, 4.8)	<ol style="list-style-type: none"> 1. Access to safe – piped drinking water 2. Access to improved sanitation services 3. Reliability of service provision 4. Increased customer service quality 	High (1 –4)
	<ol style="list-style-type: none"> 5. Quality systems output 6. Increased project functionality 7. Sufficient pressure in order to meet the customer demand 8. Increased office and front line service 9. Quality performance or reduced error rate 10. Increased training of staff 	Medium (5 – 10)
“Others” (Table 4.9).	<ul style="list-style-type: none"> • Terms of reference and conditions of agreement to be well stipulated. • Bring on board the community for more VFM • More investments in infrastructure. • Metering to allow Pre-paid meters should be used. • Close monitoring and ensure compliance to the agreement is adhered to. • Choose a pro-poor model of PPP. 	N/A – to be tested further in the semi – structured interviews.

High = Mean Values from 4 and above; Medium = Mean Values from 3 and above but below 4; and Low = Mean Values of below 3. This is shown in Table 4.11 below:

The attributes presented in Table 4.10 above and as represented by each independent variable (Cost, Time, Quality and ‘Others’, in section 4.2.5 above) were arrived at using a thorough tabulation and mean value ranking positions arising from Part C of the questionnaire. Part C of the questionnaire required to rate the attributes using the “Most Suitable” ranked PPP Model in Part B of the questionnaire as a dependent variable against each independent variable. For instance, if Concessions contract is ranked as the most suitable PPP Model, it was used to rate cost, time and quality dimensions using their respective attributes.

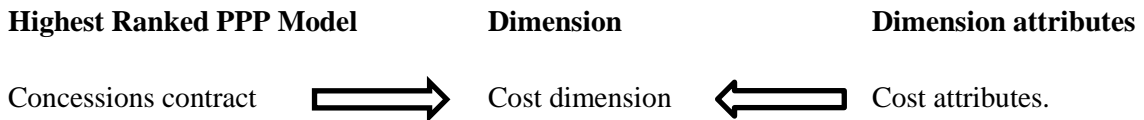


Table 4.11: Summary of Mean Value Categories for Cost, Time and Quality Attributes Based on Mean Value Rankings and weighting (as in Table 410)

Factor Attribute	Mean Value Ranking Categories		
	High (4 and above)	Medium (<3>4)	Low (>3)
Cost Attributes	1, 2, 3 & 4	5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, & 18	19 & 20
Time Attributes	1, 2 & 3	4, 5, 6, 7, 8, 9 & 10	Nil
Quality Attributes	1, 2, 3 & 4	5, 6, 7, 8, 9 & 10	Nil

Table 4.11 above indicates the mean value ranking categories within which cost, time and quality attributes fall. For instance, cost attributes 1, 2, 3 and 4 fall in the high mean value ranking category whereas 19 and 20 fall in the low mean value category respectively. This entails that for decision making purposes, it is indicative of the attributes whose contribution to effectiveness could be high or low and a mix of some attributes from different categories would be ideal for the purposes of resource balancing.

4.3.1 Conceptual Alpha Model

A Conceptual Alpha Model has been developed that shows how the existing PPP Models could increase effectiveness of dimensions of cost, time and quality taking into account the existing PPP Models as ranked in Table 4.2 and mean value rankings and categories Table 4.11 above.

The logic behind the development of the Conceptual Alpha Model is premised on the revelation that some attributes are likely to increase effectiveness of their respective dimension much more than others. In this case, the attributes with high mean value categories have a higher effect than those with medium and low mean value categories respectively as depicted in Table 4.10 and 4.11 above. This will in turn show how the preferred model(s) would increase effectiveness on the dimensions in question.

The Conceptual Alpha Model therefore aims to depict how the existing PPP Models as ranked in Table 4.2 would increase effectiveness of dimensions of cost, time and quality. The Model also aims to determining the effect or impact in terms of contribution to increased effectiveness based on high, medium or low weighting of various attributes used in rating the levels of significance in order to assist in the decision making process. The Conceptual Alpha Model therefore shows the overall effective of each existing PPP Model when it comes to increased effectiveness of dimensions of cost, time and quality. Activities attributed to these dimensions could therefore be scheduled and implemented based on priority. However, in practice, this may not be attained and a mix of these activities may be ideal depending on the availability of resources.

As indicated in Paragraph 4.2.5 above, the dimensions of cost, time and quality were distinctively identified and extracted from the literature review whereas their respective attributes form part of the measures used to determine the operational performance of the water utilities in terms of effectiveness and efficiency and also from the regulator's perspective, for monitoring and evaluation purposes. Therefore, in arriving at the factors of cost, time and quality and their respective attributes, and considering that these variables were not latent but clearly manifested in the literature review, factor analysis could not be used. Factor analysis is a method of data reduction used to identify and extract relatively small set of variables (preferably uncorrelated) from a large set of variables (most of which

are correlated to each other). The factors were considered conceptually meaningful, few and relatively independent from the outset even without employing factor analysis as a statistical technique.

The Conceptual Alpha Model has also been extended by including other attributes that were identified by respondents and considered to increase effectiveness based on the analysis of Part D of the questionnaire survey. These are termed as “**others**” and will be tested further during the semi-structured interview process in order to authenticate their suitability or impact on the independent factors. The Propositional Model of how the existing PPP Models could increase effectiveness of dimensions of cost, time and quality is presented in paragraph 4.2.4 and clearly shows how the factors would relate to each other.

The increased effectiveness will be determined by each of the PPP Models arising from Part B of the questionnaire at the most suitable level, i.e. Concession contracts, Management contracts, Affermages contracts and Service contracts as dependent variables respectively, and cost, time and quality as independent variables for each of the models. While the most preferred PPP Model at “Most Suitable” level has been identified (Concession contracts) in Part B of the questionnaire, and possibly the most preferred PPP Model based on the respondents responses, the researcher endeavours to include in the Conceptual Alpha Model the other PPP Models at the “Most Suitable” level despite them not being ranked the highest. The inclusion of all the models in the Conceptual Alpha Model can further be justified in that the percentage ratings of all the existing PPP Models at “Most Suitable” level are below 50 percent thereby not giving any particular model an absolute advantage. The four (4) PPP Models as identified in the literature review have therefore been included accordingly and related to the results arising from the respondents. Each of these independent variables is represented by a number of attributes that are said to increase its effectiveness based on the mean value ranking positions and categories as indicated in Figure 4.19A, 4.19B, 4.19C and 4.19D below.

While Concession contracts are the most preferred, there is likelihood that the other contracts could be implemented as well on the phased approach considering that they are able to increase effectiveness of dimensions of cost, time and quality at reasonable levels. The Conceptual Alpha Model is broken down into four (4) levels, i.e. Level 1, 2, 3 and 4 based on

their mean values. For instance, all high mean values (as presented in Tables 4.10 and 4.11 above) from each of the dimensions have been grouped together to show the level of impact in terms of increased effectiveness (Figure 4.19A). Those with medium mean values have also been grouped together (Figure 4.19B) as well as those with low mean values (Figure 4.19C). These are depicted in Table 4.10 and 4.11 above, page 165 and 166. These culminates into a summary model presented in Figure 4.19D)

Figure 4.19 A: Conceptual Alpha Model using attributes that increase Cost, Time, and Quality effectiveness at various mean values using existing PPP Models - Level 1:High Impact.

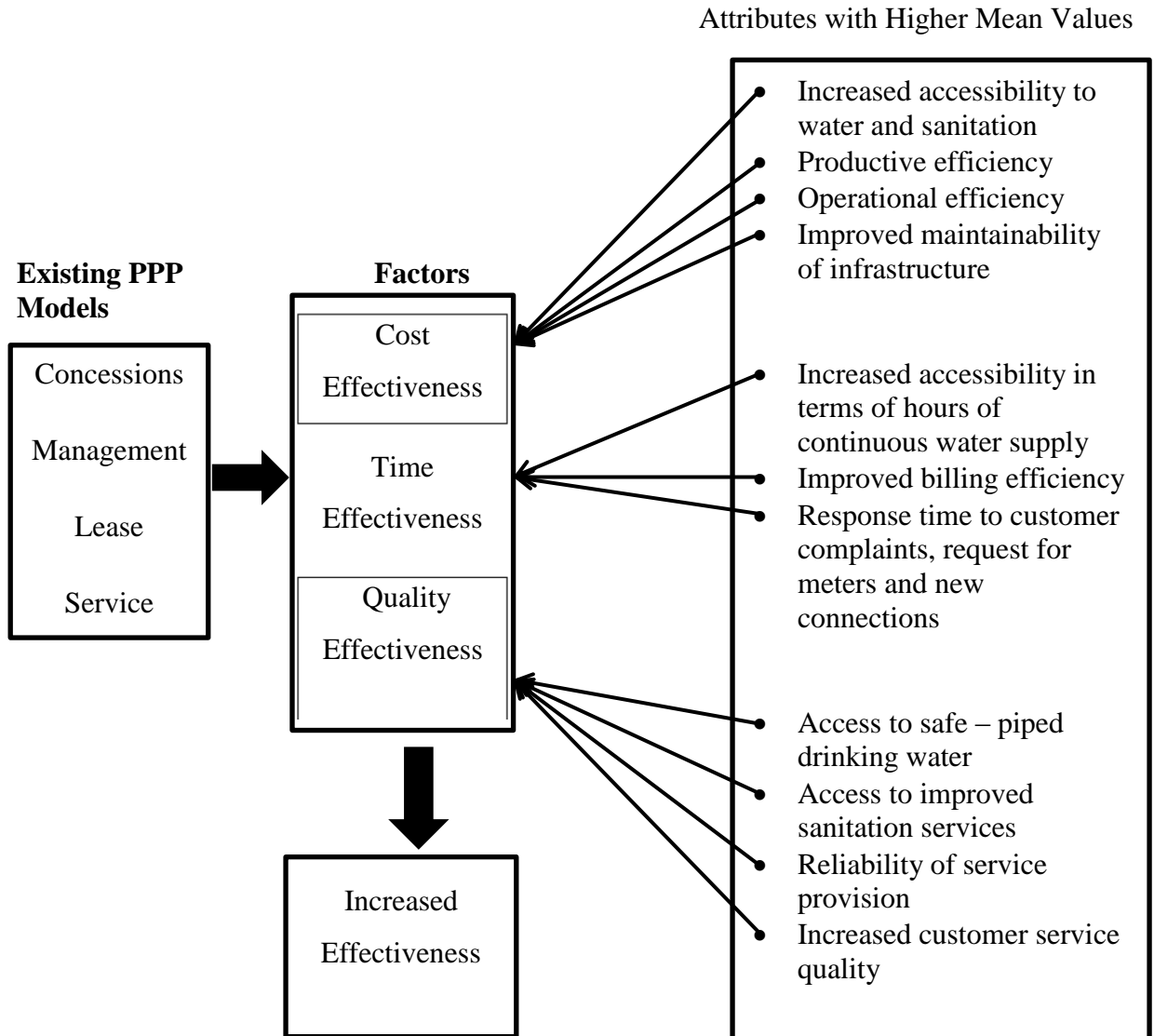


Figure 4.19 B: Conceptual Alpha Model using attributes that increase Cost, Time, and Quality effectiveness at various mean values using existing PPP Models - Level 2: Medium Impact.

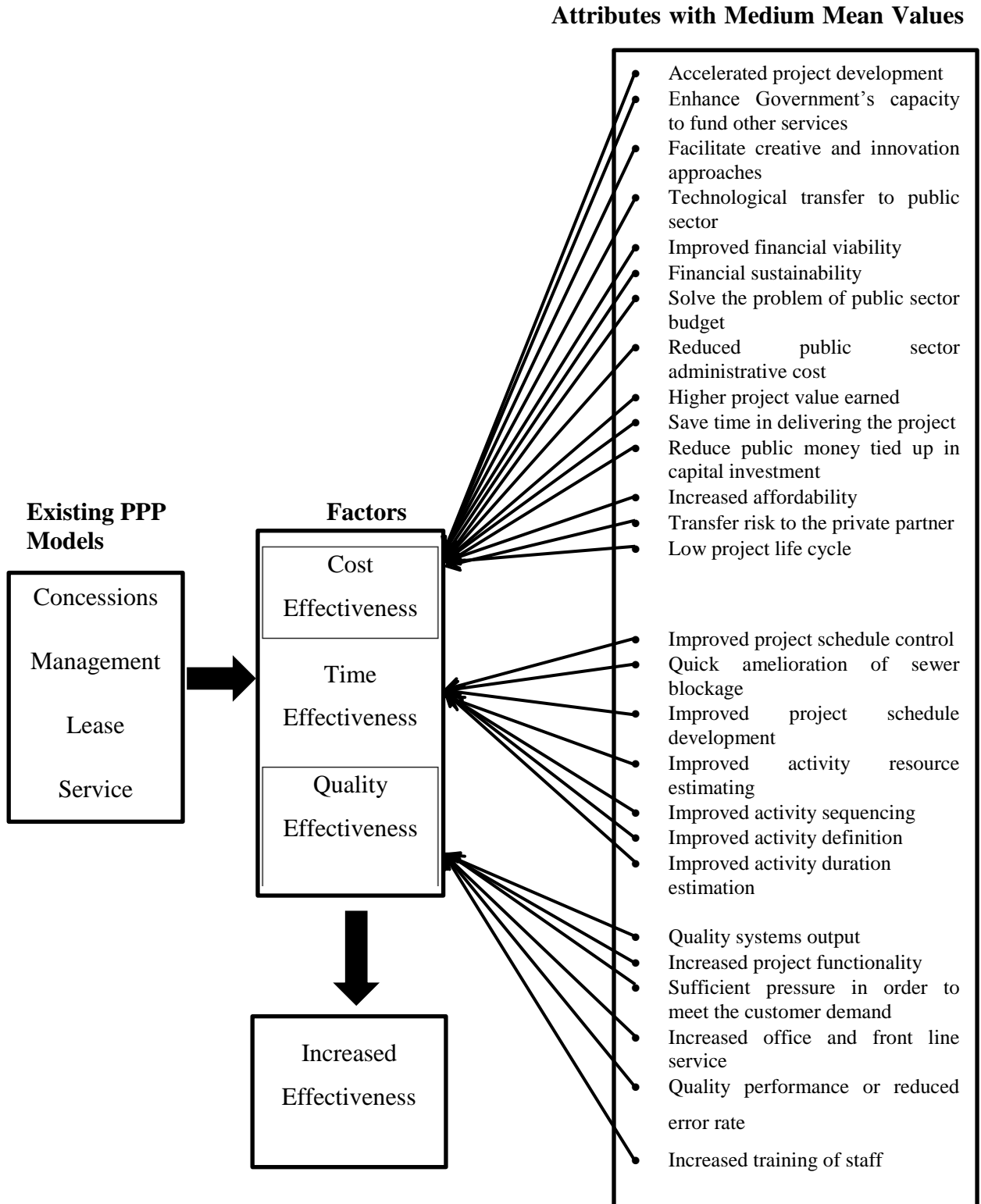
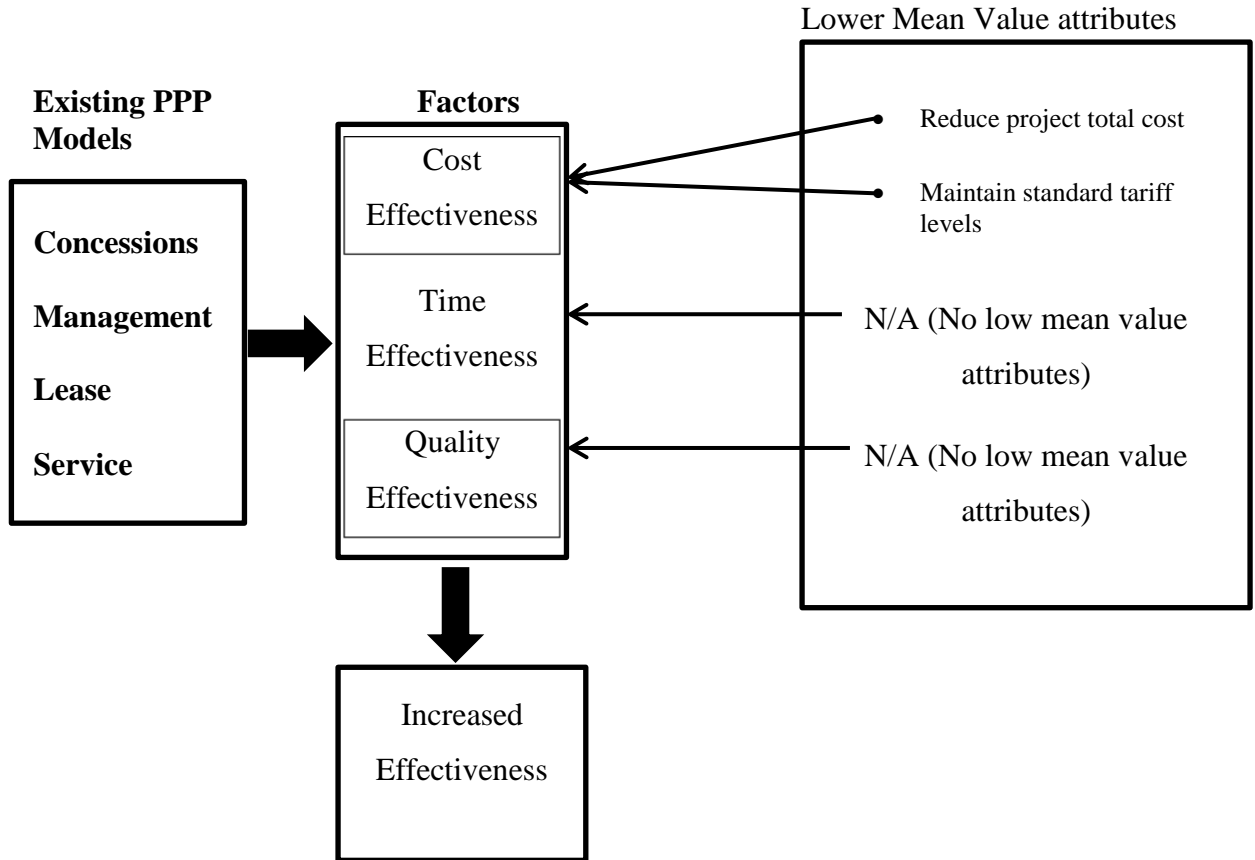
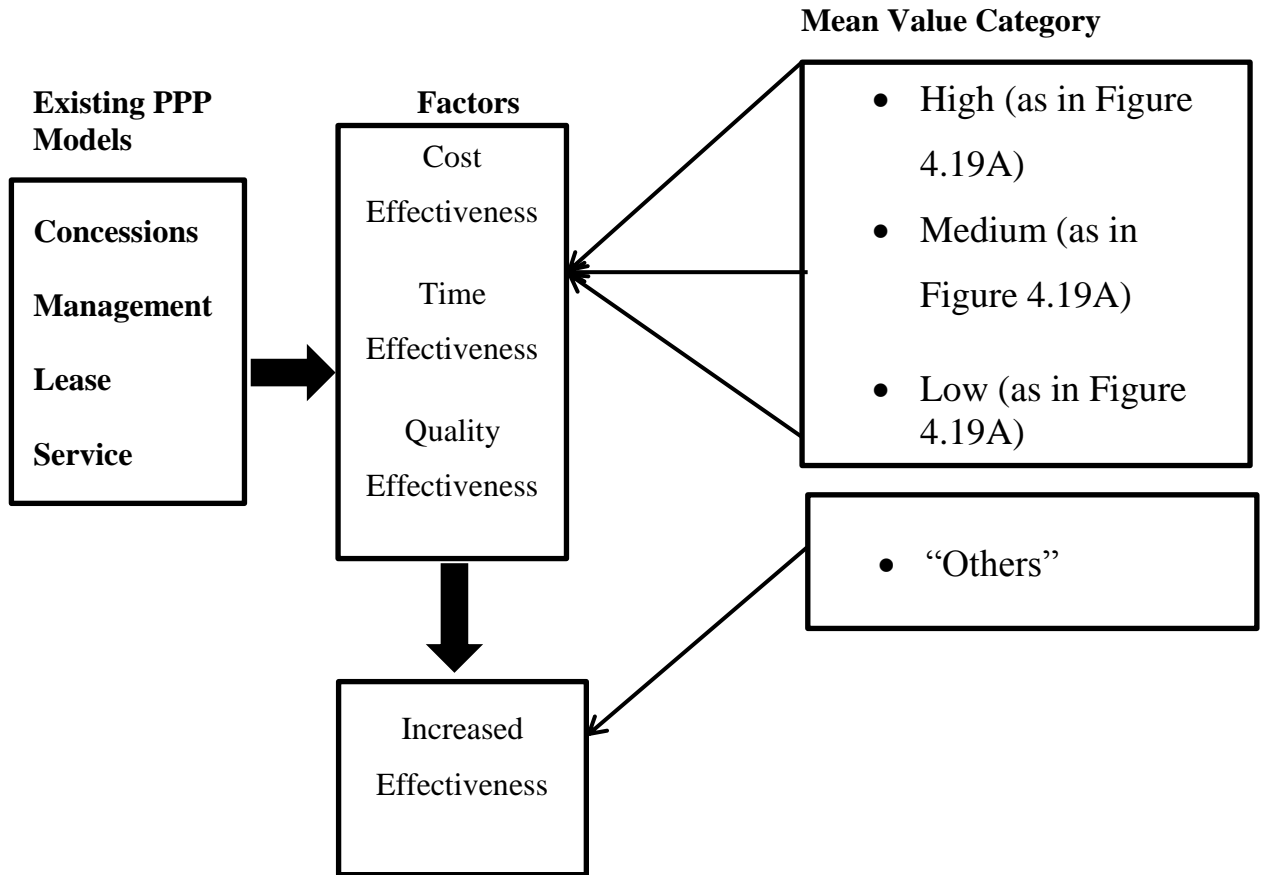


Figure 4.19 C: Conceptual Alpha Model using attributes that increase Cost, Time, and Quality effectiveness at various mean values using existing PPP Models - Level 3: Low Impact.



Note: There are no mean value attributes for Time and Quality.

Figure 4.19 D: Summary Conceptual Alpha Model for Existing PPP Model increased effectiveness - Levels 1, 2 and 3 Combined Impact.



The summary below depicts the rationale behind the 4 – Staged levels of the Conceptual Alpha Model arising from Figures 4.19A – 4.19D.

4.3.2 Summary and Conclusion of Section 4.3 above

Level 1 in Figure 4.19A constitutes cost, time and quality attributes that increase effectiveness of dimensions of cost, time and quality based on high mean values (i.e. mean values from 4 and above as in Table 4.11). These attributes signify respondents’ higher preference in terms of increasing effectiveness based on higher ratings. The attributes relate to each of the existing PPP Models independently and the rating of attributes to particular factors based on a most suitable existing PPP Model does not influence the outcome of the other. Level 1 has therefore a higher effect in terms of increasing effectiveness.

Level 2 in Figure 4.19B constitutes attributes that increases cost, time and quality effectiveness based on medium mean values (i.e. mean values from 3 and above but below 4 as in Table 4.11). Again, these have a medium preference in terms of increasing effectiveness based on medium ratings. In this case, Level 2 has a medium effect in terms of increasing effectiveness.

Level 3 in Figure 4.19C constitutes attributes that increases cost, time and quality effectiveness based on low mean values (i.e. mean values below 3 as in Table 4.11). Again, these have a low preference in terms of increasing effectiveness based on low ratings. In this case, Level 3 has a low effect in terms of increasing effectiveness. However, it should be noted that there are only two (2) attributes for the cost factor and none for time and quality.

Level 4 in Figure 4.19D depicts a summary Conceptual Alpha Model signifies that the existing PPP Models could increase effectiveness of dimension of cost, time and quality at three levels of impact based of mean values. The synergistic effect of high, medium and low levels is projected. 'Others' are likely to affect the increased effectiveness. The mean value categories that signify the impact of the various attributes are not likely to be used in a mutually exclusive manner but in a combined effect. The Conceptual Alpha Model is further developed after the semi-structured interview in order to come up with a Conceptual Alpha Model. In other words, all the existing PPP Models are likely to increase effectiveness of dimensions of cost, time and quality based on their mean value ranking and impact levels.

It could be concluded therefore that all the existing PPP Models could increase effectiveness of dimensions of cost, time and quality at different levels of impact arising from the various attributes rated as high, medium and low in terms of mean values. In increasing effectiveness, a combination of attributes in terms of impact is cardinal though increased effectiveness may not only be achieved by high value rated attributes but possibly a combination of attributes that could be implemented together easily. For instance, attributes in high level categories may be combined with attributes with medium level category. A mix of them would be ideal from the resource availability point of view and subsequent ease of implementation.

PART B: Semi – Structured interviews

4.4 Introduction

This section presents and discusses the results gathered from the interview survey with selected PPP experts. These are experts as defined by Belting (2008) in paragraph 4.1 above. The interview survey follows the questionnaire survey conducted whose data was statistically analysed and the results therefrom used to develop a Conceptual Alpha Model as in PART A of paragraph 4.5 above. As in the questionnaire survey, a pre-determined set of interview questions were prepared to include issues that arose from the questionnaire and subsequently piloted with the same institutions used for the questionnaire survey pilot for perfection, alignment and flow of questions before the individual experts were contacted. In this way, an effective way of obtaining opinions, feelings and experiences was achieved and improved on reliability.

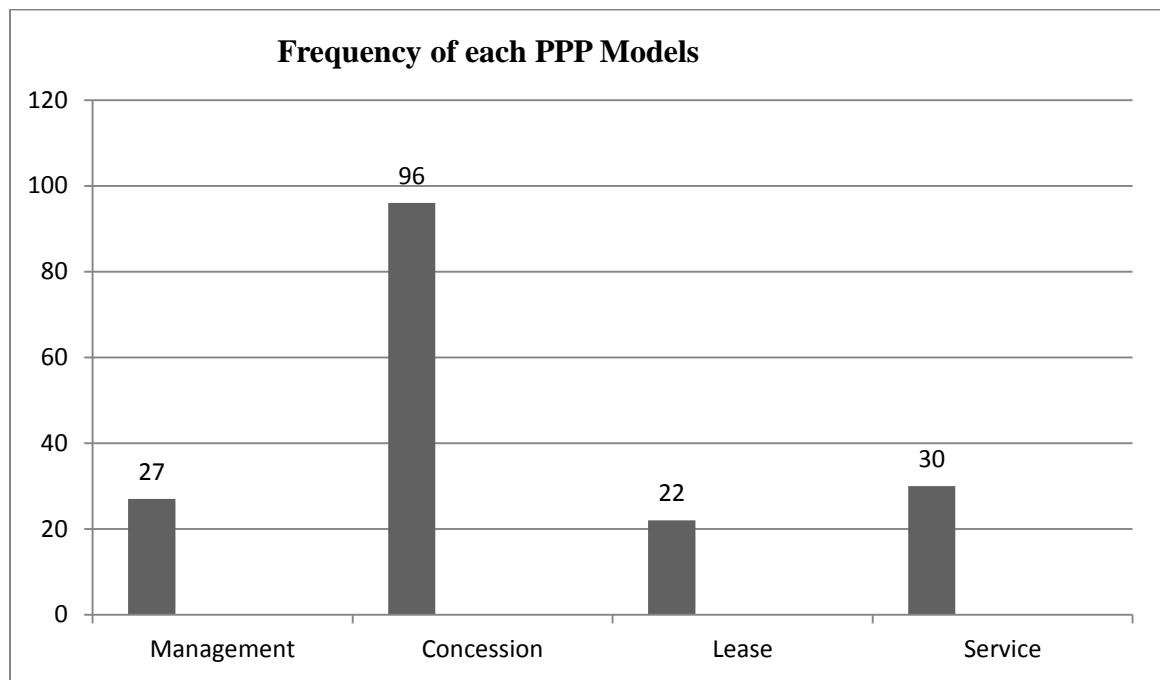
The interview survey has been used to further obtain collaborative data from selected PPP experts in various sectors. The results from the interview provide a synergistic effect on the results from the questionnaire and aid in minimising the limitations of using an individual methodology. This underscores the importance of the triangulation approach to research as defined in Chapter four on methodology. In this way, the results from the interview survey have been used to verify the results from the questionnaire survey. This culminates into the development of the Conceptual Beta Model and its subsequent verification. The interview survey also allowed the research findings to be presented using a combination of both quantitative and qualitative methods to aid enrich the study. The analysis and results have been presented in accordance with the main themes in the interview in collaboration with the questionnaire survey results and as signified by the use content analysis method of data analysis.

4.5 Knowledge levels of Public Private Partnerships (PPPs).

In PART A of the questionnaire survey, respondents were asked to rate their knowledge levels on PPPs. Based on the ratings therefrom, as indicated in paragraph 4.2.2 (Results, analysis and discussion), at least 90 percent of the respondents had knowledge levels ranging from average to sufficient. According to the analysis as in Figure 4.20 below, the experts

have confirmed the various PPP Models as reported in the questionnaire survey data analysis in Part A above and literature review and clearly indicate that though BOT, BOOT, and DBOOT are all forms of Concessions, they are normally undertaken in Greenfield kind of investment. In this way, Concessions could be distinguished and adopted based on this clarification.

Figure 4.20: Knowledge levels of identified PPP Models



Concession contract has the highest frequency of 96 representing 54.86 percent, followed by Service contracts with 30 (17.14 percent), then Management contracts with 27 (15.43 percent) and finally Lease contracts with 22 (12.57 percent). The higher frequency exhibited by Concession contracts clearly indicates a greater emphasis on this PPP Model and possibly the reason why respondents from the earlier survey preferred it for possible adoption in the development of the Zambian Water and Sanitation Sector. However, in both the questionnaire and interview survey, it is evident that there appears to be sufficient knowledge of identified PPP Models. Additionally, respondents had no problem confirming Concession contracts in various sector in Zambia, but had some reservations on others in terms of where they have been implemented or being implemented. For instance, respondents were of the

view that the leasing out of the water and sanitation sector to commercial utility companies amounts to Management contracts though indications are that all the user fees are retained by the commercial utilities thereby defeating the whole purpose of Management contract that requires that a certain amount in terms of management fees be paid to the operators. Similarly, respondents were of the view that full cost recovery cannot be achieved thus not able to make sufficient returns for subsequent capitalisation. This is despite additional capital injections from cooperating partners. As such, the social wellbeing of the public cannot be enhanced to the expected levels.

Respondents were also of the view that Service contracts have been done in many sectors in Zambia though not formerly acknowledged as PPPs. A number of respondents cited situations where water utility companies have partnered with some community groupings to provide water services and are paid some form of commission as a percentage of the revenue collected. Government hiring of companies to provide cleaning services under the “Make Zambia Clean” campaign was considered has forms of Service contracts though not acknowledged as PPP. The interview survey has therefore provided additional detailed explanations on PPP Models available in Zambia and/or elsewhere and has also authenticated the earlier results and literature review findings.

Notwithstanding the above analysis, the author is of the view that possibly, and for Zambia in particular, there is need to sensitise both the public and private sectors on what rely constitutes a PPP in line with the PPP policy and Act of 2009 and what is obtaining elsewhere in the world. This kind of communication would make the public appreciate further what PPPs are and the benefits associated with them mainly in terms of infrastructure enhancement and service delivery. This would assist in putting various PPPs into context and make their initiation and implementation easier.

4.6 Sectors in which PPPs have been implemented, in Zambia or elsewhere, and whether they have been successful or not.

This section aimed at getting respondents views on sectors in which PPPs have been and/or are being implemented in Zambia or elsewhere in order to establish the widespread of PPPs but also to get their views on whether PPPs have been successful or not.

According to respondents, a number of PPPs have been initiated and being implemented in the Zambian transport/service, agriculture and construction sectors. Predominantly, the construction sector was top on the agenda thus confirming the earlier results from the questionnaire survey where 56.9 percent of the respondents were in affirmative. One of the respondents stated as follows: *“PPPs have been initiated in the agricultural sector such as the concessioning of the Nasanga farms to a private investor and construction of dams in Chisamba, Lushitu and Chirundu as communal assets for the purposes of out grower schemes..... whereas the transport sector as seen the concessioning of the railway system and a number of service contracts have been initiated”*. Nonetheless, respondents were of the view that PPPs can be implemented in any sector. This is in line with what is noted in the literature review in Chapter Two.

As to whether PPPs have been successful or not, respondents expressed mixed feelings on this aspect considering that PPPs currently running in Zambia are at different stages of implementation. For instance, respondents were of the view that the Lusaka City Council is yet to determine the level of performance so far achieved for the Lubama market that was constructed under a Concession contract though the market is being used to capacity. Similarly, respondents' views were that proper performance of PPPs could only be assessed at the end of the period or concession although it was generally felt that they could be successful once fully implemented. Again, this is in line with the results from the assessment of various PPP Models in the Western and Central parts of Africa and as noted in the literature review. PPPs were considered as either successful or not depending on their levels of completion (Falls et al., 2004).

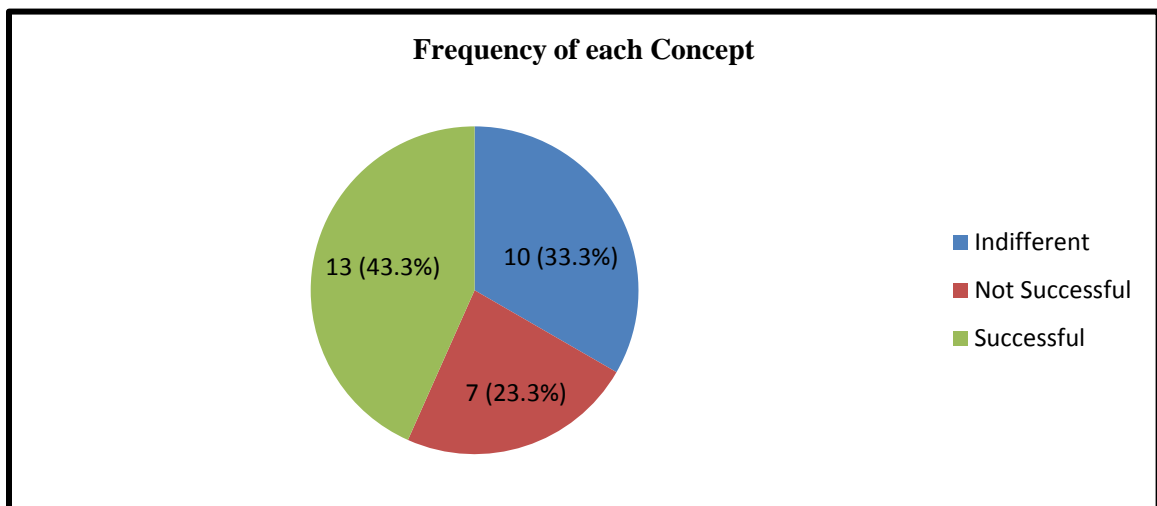
Nonetheless, and arising from the literature review chapter, paragraph 2.2.5, in 2001, a five-year Johannesburg water PPP management contract that emerged to bring in new expertise and efficiency in the delivery of public utility services was considered so successful (World Bank, 2010). Factors that contributed to the success included: higher levels of political commitment from the start; simple clear objectives such as to establish a viable, corporatized public water utility with well-defined performance targets; the municipality adopted a flexible approach to measuring the year-by-year impact of the private operator; both partners were committed to success and worked well together; and a strong focus on developing

human resources. This indicates that in a way, for PPPs to be successful, there is need for a favourable environment to support its initiation and implementation.

On the other hand, the Zambia Railways concession that was awarded to Railways Systems of Zambia (RSZ) was said not to have being successful and was eventually terminated by Government’s decision for non-performance. One respondent noted as follows: *“PPPs have a number of complications that needed to be addressed in the process of implementation such as the public perception of what they think a PPP should be, culture of thinking that Government should always subsidise on service provision, culture change by public utility companies providing water and sanitation services, and supervision that requires capacity building by the private sector.....these and many more may inhibit PPPs from succeeding”*. Nonetheless, respondents were of the view that with proper structuring of PPPs, their likelihood of success could be quite high.

Overall and according to the conceptual analysis in Figure 4.21, a frequency of ten (10) representing 33.3 percent shows indifferent, meaning that respondents’ could not categorically state whether PPP Models have been successful or not and that there success is depended on the type of model adopted. A frequency of seven (7) representing 23.3 percent indicates that PPP Models appear not to be successful based on a number of failures recorded where they have been implemented whereas a frequency of 13 representing 43.3 percent indicates that PPPs appear to be successful.

Figure 4.21: Determining Successfulness of PPP Models



While taking the views of the respondents into account, it is the author's view that if PPPs are to be successful, there is need for employees and the public at large to change their mind set so that they could buy in the private sector norms of operations. The private sector is perceived as being focused more on making profit and thus little attention paid on other social obligations. There is need for more sensitisation on the role of the private sector in public service delivery. It is important that critical success factors are identified early in the contractual arrangement and their performance monitored to a successful conclusion. Political will and commitment is a starting point.

4.7 Main benefits of introducing the preferred PPP Models in the Zambian Water and Sanitation Sector to both the public and private sectors.

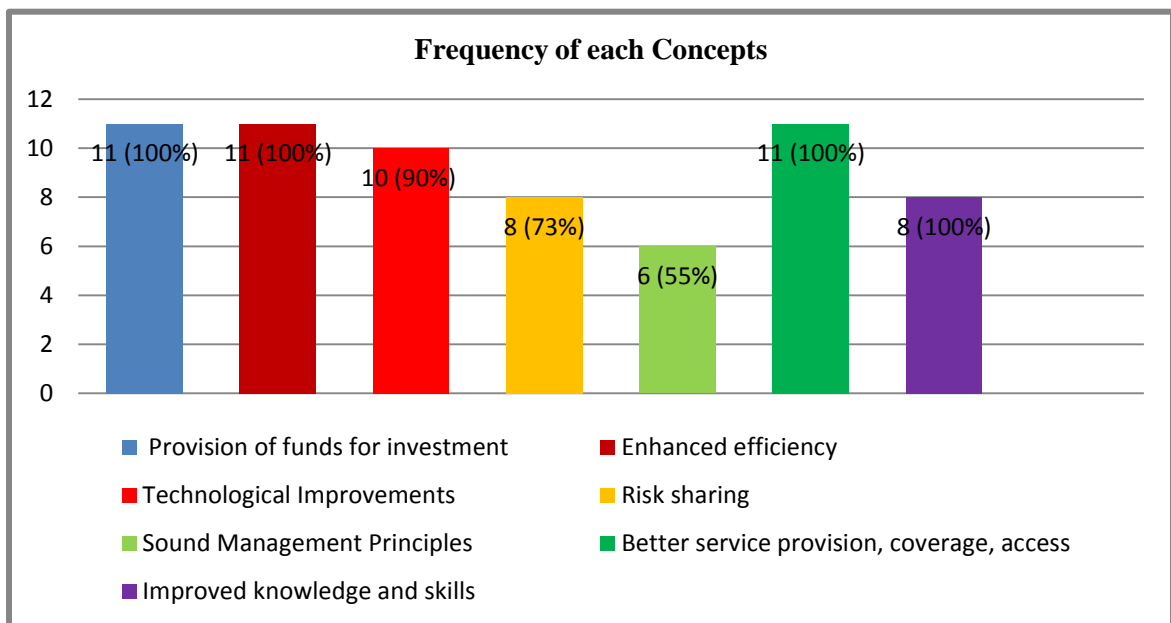
In the questionnaire survey, main focus was on ranking the preferred PPP Models. Concession contracts were ranked first with a 44.8 percent followed by management contract with 19.3 percent and Service contracts were ranked least with 9.4 percent. However, the results indicated that each of the existing PPP Model could be used to increase effectiveness based on the ratings from the cost, time and quality attributes and as represented by their respective mean value ranking positions and categories.

In this section, the author sought to know the main benefits associated with the introduction of the proposed PPP Models (Concessions, Management, Affermages and Service contracts) both to the public and private sectors regardless. Respondents were also asked to state if at all there are any demerits of doing the same and how they would be addressed and whether they agree with the proposed models.

According to the conceptual analysis, respondents are of the view that introducing the proposed PPP Models would benefit the public sector in form of capital meant for infrastructure development or enhancement, improved technology, enhanced efficiency, improved knowledge and skills, sound management principles and improved service provision, coverage and access. As in Figure 4.22 below, it could be extrapolated that there does appear to be greater emphasis on provision of funds for investment, enhanced efficiency and better service provision, coverage and access all rated 100 percent of the respondents. This is followed by technological improvements (90 percent), then risk sharing and sound management principles with 73 percent respectively and improved knowledge and skills was

considered the least with 55 percent. All of them appear to be ideal and need arise to consider them when determining the effectiveness of the proposed PPP Models. However, it was evident from all the respondents (100 percent) that higher tariffs may not be easily acceptable by the public and 45 percent were of the view that there could be elements of cultural despondence exhibited and the public sector may lack the capacity to monitor the performance of the private sector.

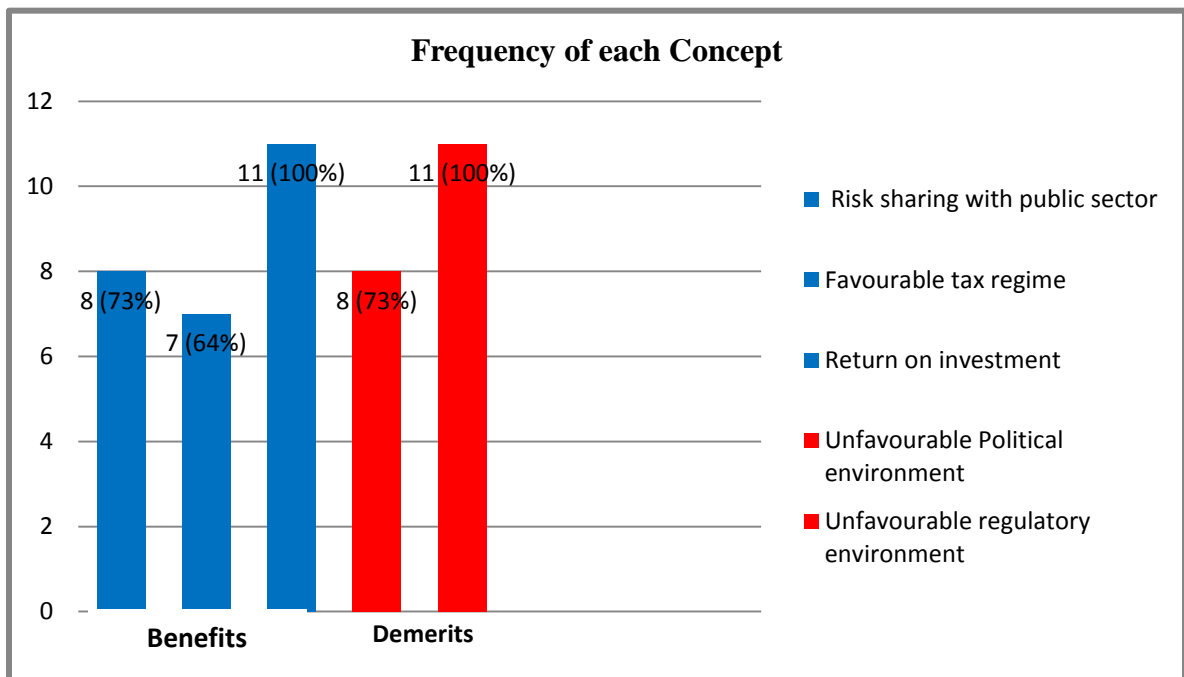
Figure 4.22: Main Benefits of Introducing PPP Models in favour of Public sector



As for the private sector, respondents are of the view that benefits would come in form of returns from capital invested or performance related fees based on achieving certain benchmarks as defined in the agreement; risk sharing with public sector; and favourable tax regime. According to Figure 4.23 below, there appears to be a greater emphasis on return on investment supported by all respondents (100%), then risk sharing with 73 percent and then favourable tax regime with 64 percent being the least. Nonetheless, both unfavourable political environment and regulatory environment appears to be major draw backs based on the higher frequency counts.

It could be deduced from the above analysis that the private sector is considered a vital partner for capital injection, risk sharing and ultimately value addition in terms of quality of service, increased quantities of water provision (24/7), and enhanced skills levels as a result of improved technological and infrastructure enhancement. This entails that efficiency could be enhanced and risks apportioned between the public and private sectors. The private sector would bring about good habits and management practices which are desperately needed in the public sector. In other words, the private sector should be allowed to participate in national affairs as a way of contributing to both the social and economic growth and development though ultimately the private sector main motive is to make profit. Ultimately, this entails that Government would unlock the budget potential to other needy areas of service provision. While the private sector operations are associated with higher tariffs, especially in the case of concessions and lease contracts, the private operator is likely to charge lower fees considering that the operations are for a long period of time. The private sector participation is also likely to increase the coverage in terms of distribution and the number of customers accessing the commodity.

Figure 4.23: Main Benefits & Demerits of Introducing PPP Models in favour of the Private sector



Similarly, and notwithstanding the above benefits, the introduction of PPPs in the water and sanitation sector would come with its own de-merit. While the private sector is likely to bring about enhanced efficiency, they are also likely to demand higher tariffs for the water and sanitation services provided and in the absence of much public awareness, the public may reject the move and become a point of social stress. The private sector is likely to charge economic rates and tariffs may be raised in relation to the cost of production and expected return on capital employed. Taking an example of toll fees from the road sector, these may not be easily acceptable by the public especially the locals in a country like Zambia where in most cases the levels of disposable incomes are very low. This is likely to bring about resistance and therefore not able to adhere to the private sector needs.

In addressing the de-merits, respondents were of the view that Government should put in place both a well-developed policy on and regulatory and legal framework that encourages Private Sector Participation. There is need to sensitise both the public and private sectors to appreciate the mutual relationship that should subsist between them taking into account both interests.

As to whether they agreed with the proposed PPP Models, all were in favour of the proposed models adopted but that their implementation should be based on a pro-poor kind of arrangement coupled with other factors considered below. Zambia is considered amongst the Least Developed Countries with higher levels of poverty (around 70 percent) and respondents felt that there is still need to subsidise the water services before an economic tariffs could be established. Concessions would be ideal for the purposes of tariff setting that needs to be reasonable in order for the public to buy in and allow the investor to recouple the capital invested in a longer period of time. A lower tariff would be set as opposed to an economic one. Similarly, considering that Government still has a certain level of infrastructure in the sector in question, respondents were of the view that a management contract could be adopted as it tends to reduce costs base on its use of already available infrastructure and its ability to attain an economic service provision. However, respondents were of the view that it may not be ideal for Zambia, considering that the current infrastructure is dilapidated. The need for infrastructure development would then arise but Government has no resources to do so. Based on this, Concession contracts would be preferred patched up with Management and/or Service contracts that are normally associated

with shorter periods. Nonetheless, management contracts would still be ideal once capitalization of infrastructure is done.

4.8 How the adoption of existing PPP Models could increase effectiveness.

(a) Cost effectiveness

According to the respondents and having taken into account the current nature of operations in commercial utilities, they were of the view that the cost arising from remedying the dilapidated infrastructure could end up going up in the process of remedying and perfecting the water supply and sanitation situation in the short run. As indicated in the literature review, most of the infrastructure were installed many years ago and has out lived their useful lives thus lacking efficiency. This has led to increased Non-Revenue Water (NRW) both from the commercial and production side in terms of losses.

Nonetheless, respondents were of the view that due to fusing into the system new technologies by the private sector that in turn could amplify the reticulation, production, storage and distribution of the commodity, the cost effectiveness may be achieved in the long run. This effectively entails that inefficiencies will be minimised and could lead to immense improvements in the output/input ratio in terms of water production and supply. The service levels would then be improved upon to the expected standard levels and tariff levels would be minimised due to reduced costs.

It was also the respondents view that Government could assist by zero rating some materials to be used in the reconstruction of the water and sanitation sector and provide some tax incentives for the private sector to have a reasonable return on its investment. This would assist in ensuring that the expected return is synchronised with the social expectation of the public. With new technology, efficiency is likely to improve thereby lowering the cost of production and ultimately the tariffs. It is also true that the private sector motive is to make a reasonable return and would ensure that the cost structure is minimised. Indications are that, cost effectiveness could be achieved in the areas of human resources as the private sector is sensitive to the number of staff they retain for a particular job as opposed to the public sector, how much should be paid and the skills levels. Ultimately, the private sector has a high tenacity to cost effectiveness by employing cost control and cost reduction strategies. These

are strategies that ensure that the cost of operation is maintained at a level that do not affect the bottom line and not compromise the set standards and accelerate tariffs. In other words, the need to justify every cost before incurring it becomes inevitable thus ensuring cost effectiveness. Cost effective is defined in the glossary of terms in Appendix 1.

(b) Time effectiveness

The respondents' views were that since the private sector motive is to make a profit, timely provision of the service would be cardinal. Time effectiveness could be achieved through improved service levels arising from quick response rate, increased supply hours (24/7) and ultimately improved work efficiency. Respondents were also of the view that improved efficiency as a result of infrastructure development will not only ensure cost effectiveness but improve on time accomplishment of various activities in the provision of water and sanitation. For instance, good piping would allow sufficient water to reach the consumer in good time. This effectively means that there will be a reduction in NRW; billing would be efficient and improved; resource estimating, sequencing of activities and project scheduling would be done timely; and response time to various complaints would be reduced.

(c) Quality effectiveness

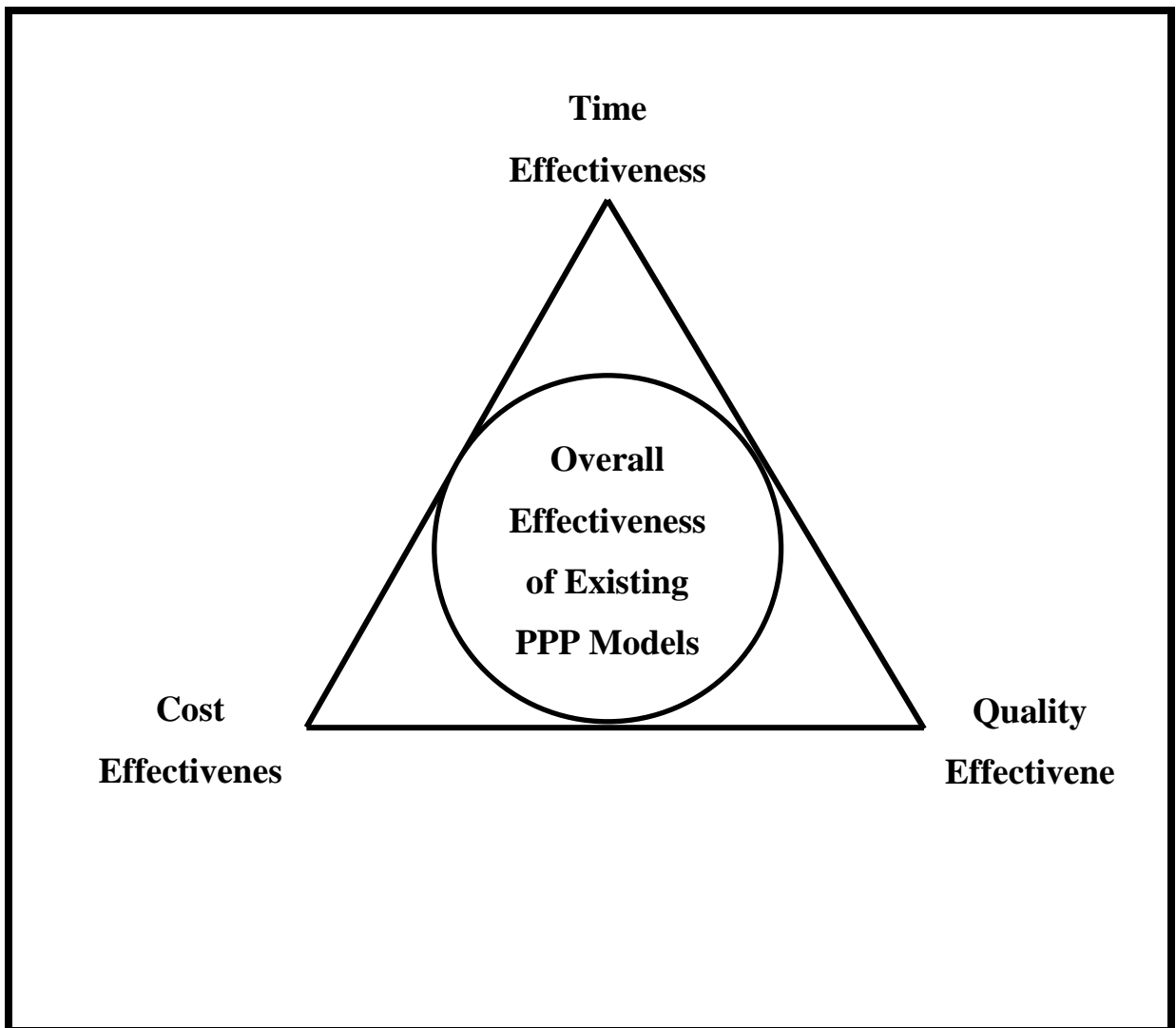
According to the respondents, quality may be achieved by meeting the standards prescribed in the sector by the regulator such as quality water provision with less bacteria content due to proper chlorination of water, and generally service provision. It was the respondents' view that if quality is not achieved, then the revenue generating ability would be compromised. This would in turn affect the private sector's incentives in terms of performance based fees or return on capital employed (ROCE). The regulator would also be up in arms with the private sector for not meeting the expected standard levels prescribed and by not doing so pushing the cost and time to rectify the poor quality higher.

Overall, respondents' view cost, time and quality effectiveness as synergistically related were individual inputs results into a much higher output when combined. In other words, the overall effectiveness is likely to be influenced by the contribution from each factor. The three factors therefore provide some kind of symbiotic relationship towards overall effectiveness as indicated in Figure 4.24 below.

Squeezing any of the three factors would mean exerting pressure on the other two factors and vice versa.

It is the author's view that there is need to take into account this kind of relationship in the establishment of overall effectiveness of the opted PPP Models and ensure that an equitable balance is established. Nonetheless, establishing an equitable balance would pose a challenge depending on the availability of resources on disposal.

Figure 4.24: Relationship amongst Cost, Time and Quality Effectiveness



Source: Author's own construction

4.9 Main sources of funding to the water and sanitation sector development in Zambia.

In this section, the author wanted to know the main sources of funding to the Water and Sanitation Sector and whether they are sufficient or not and any other sources of funding that would be ideal for the sector. This would in turn assist in determining by and large the perception of respondents as to whether they viewed PPPs as a means of funding or as a means of value enhancement in the provision and delivery of public services.

Historically, and according to the respondents, Government has been financing the provision of water and sanitation through the Local Councils across the country as part of its social obligation to the public. However, with the creation of water utility companies, financial support has been through the MLGH as part of budget support in form of grants. This trend has continued though the support is not sufficient considering the many challenges faced by water utility companies. The Water and Sanitation Sector has also been receiving finances from cooperating partners such as JICA, ADB, World Bank, the DANISH, Chinese Government, GIZ and the Devolution Trust Fund (DTF). For instance, it is said that more than 90 percent of the sector expenditure still come through foreign financing in form of budget support and/or project support (UNDP 2011) and the trend has also continued.

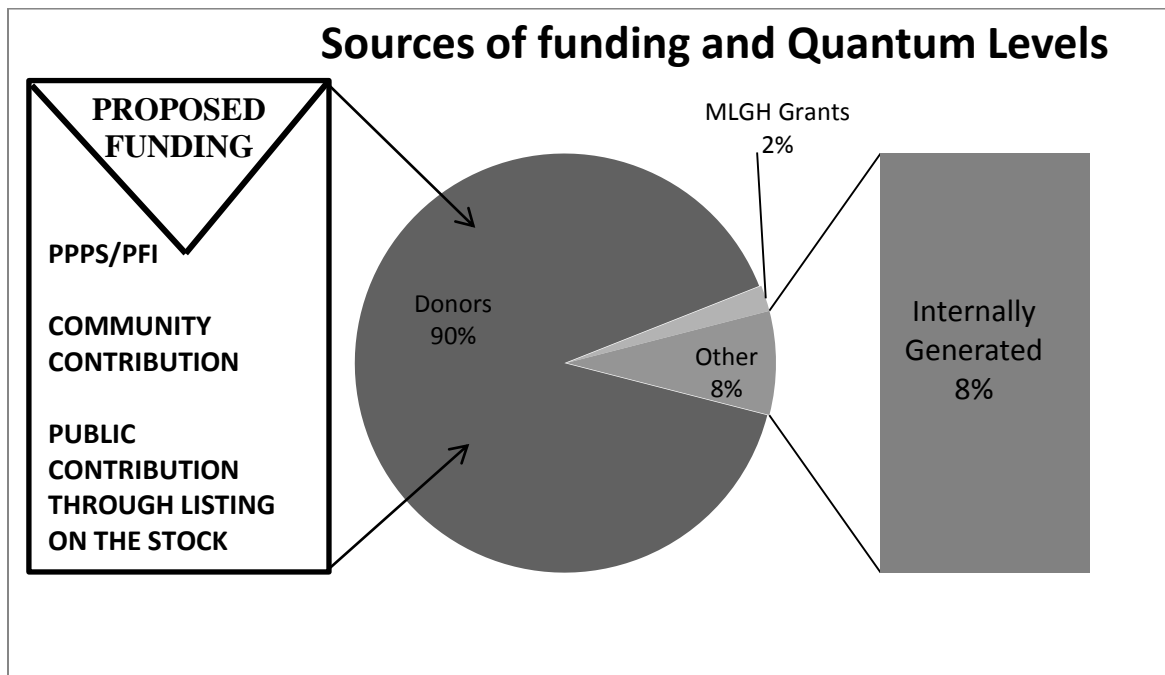
Respondents are of the view that donor funds are sometimes unpredictable and may only be released once certain conditions are met. The trend of having huge capital contributions to infrastructure development from Donors has not been encouraging and considered to be a disparate approach to funding the water and sanitation sector. Similarly, Donors have certain preferences when it comes to funding and therefore could cause a major strategic shift in terms of Government priorities. For instance, they would opt to fund either the urban or rural sector depending on their preference and not according to the strategic plan of the Government or utility company. This makes it difficult to determine exactly where the water priorities are and alternative financing would possibly act as a solution.

As indicated above, Government has also from time to time provided grants and loans through the MLGH to the water utilities though in small quantities than expected in order to fulfil their social obligations and continue having a say on water and sanitation provision. In another breath, some arrangements are made through Government where guaranteed loans

are obtained from the bilateral and multilateral lending institutions and commercial loans from local banks aimed at extending water projects. This is normally done through the MLGH in conjunction with water utility companies as long as their balance sheet could support the borrowing. At the moment, Government is now running away from subsidies and grants in order to save money for other critical areas of the economy. This entails that even the water sector subsidies are likely to reduce in some way and allow water utility company to charge slightly higher tariffs aimed at cost recovery. This will definitely not be received well by the public.

Other sources are in form of internally generated revenue by the water utilities from the water and sanitation services provided in form of user fees. These again are not sufficient due to lower tariffs charged in comparison to the cost of production. Figure 4.25 shows the current sources of funding, quantum levels and proposed funding..

Figure 4.25: Main Sources of funding for Zambia’s Water and Sanitation Sector



Based on the above analysis, respondents were of the view that the sources of financing to the water sector, either from Donors, Government and/or user fees are not sufficient. Donors’ funds are granted based on availability and are spread over many beneficiary countries needing aid. Government grants also follow certain priorities aimed at meeting

various social and economic obligations. The timing of grants is also critical as the funding may not be provided at a critical time when it is needed most. User fees may also not be sufficient due to the level of inefficiencies experienced in the sector in terms of water reticulation, processing, distribution, storage and as a result of poor infrastructure that does not guarantee sufficient revenue generation and collection. As a result, water utility companies have not been able to supply sufficient water to the expected level (24/7) in terms of quantity and quality. This trend normally infiltrates the customers who in most cases do not feel obliged to settling the bills due to the experienced intermittent supply of the commodity. Water utility companies are also affected by the problem of Non-Accounted for Water (NRW) with varying magnitudes. This is as a result of dilapidated infrastructure whose life span is almost zero.

Based on the above reasons and while all of them acknowledged the above sources of financing, respondents were of the view that PPPs financing would be the best option to assist remedy the situation. They also suggested that sources such as contributions from the community through stakeholders' participation could be ideal. For instance, the Johannesburg water PPP management contract in South Africa experienced a similar arrangement. Private Sector Participation (PSP) could also come in as a form of private financing initiatives and/or PPPs in order to improve on the available infrastructure though for most social amenities, this could be done with caution due to the expected higher returns by the private sector. Listing of commercial utility companies to enable public participation through share buying in both the primary and secondary markets of the stock exchange could also be another viable option. These are as indicated in Figure 4.22 above.

A recent projection from Government indicated that the water sector programmes would need about US\$ 1,500 million in order to fully realise the needed service provision. The Millennium Challenge project has so far allocated an investment amount of US\$ 255 million which again is far from being sufficient. The increasing population has over stripped the available infrastructure thereby subjecting it to heavy wear and tear. Need arise therefore to bring the current infrastructure to its original design capacity but also to put up additional infrastructure to cater for the growing population and new areas being developed.

It is evident from the aforesaid that respondents consider PPPs both as a means of financing and value enhancement. It is also true that value enhancement should be preceded by financing thus the focus of the study being that of increased effectiveness using existing PPP Models.

4.10 What Government could do to attract private sector participation.

Respondents are of the view that firstly, Government need to harmonise the necessary legal, operational and institutional framework that would allow effective Private Sector Participation (PSP). There should be sufficient feasibility study and due diligence studies done. For instance, the following verbatim response was captured from one of the respondents,. *“..... it would be important to establish from the onset how charges and other fees would be administered as a way of harmonising both public and private sector interests. It would also be important for Government to create an enabling environment to allow the private sector access funds from the local financial institutions and other incentives to allow them continue building on their technical capacity. Secondly, Government should enhance corporate governance principles and ensure that they keep an arm’s length or distance from the water utility companies for them to operation smoothly without much interference. There must also be assured guarantee from Government that it would not takeover operations from private operators on flimsy grounds. Similarly, Government being the major consumer of the product should ensure commitment to settling their obligations. For instance, the police, the Army, hospitals, schools etc. that use the commodity in large quantities should settle their bills promptly. Government’s non-commitment to settling its obligation is detrimental to poor performance of water utility companies”.*

The legal, operational and institutional frameworks are therefore cardinal in ensuring private sector participation and the success of any projects to be initiated and implemented.

4.11 Major obstacles in attracting private sector participation and how to overcome them.

The non – provision of an enabling legal, operational and institutional framework is one of the major obstacles to attracting private sector participation. The private sector needs sufficient finances to continue running the operations. If Government does not, for instance,

provide borrowing facilities to allow the private sector to borrow sufficient funds, this can be another obstacle. It is also true that the rate of return from the investment in the water sector in a developing country like Zambia (ranked lower - middle income) is low while the capital required is huge. This is due to the fact that the income levels and ultimately disposable incomes for most Zambians are low and cannot therefore meet the higher water tariffs to be introduced by the private sector. This is as opposed to countries such as England where the disposable incomes of most citizens are quite high and could afford to pay economic fees. The tariff mechanism has to protect the consumers in Zambia on the social perspective. If not done, it could pose a major obstacle to Private Sector Participation. Government should also increase awareness amongst key stakeholders, decision makers and the public on the need to introduce PPP Models in a sensitive sector such as water and sanitation. The awareness should be more on the benefits that would be brought about as a result of undertaking this strategic option of introducing a PPP Model. By attending to the issues raised above, such as providing a friendly regulatory environment and protecting the consumer from the social perspective, the obstacles would be minimised greatly.

4.12 Guidelines, policies and legislation available in Zambia to facilitate the introduction of PPPs and whether sufficient.

The respondents views were that the available guidelines and policies relating to water resources management, supply and sanitation, energy and PPPs include legal, operational and institutional frameworks among others are sufficient. These together provide an enabling environment in which PPPs could be developed and implemented. However, respondents' were of the view that there is still room for improvement and further strengthening in order to incorporate situation that may arise in the process. Respondents confirmed the availability of the following policies and Acts in line with the literature review:

- The National Water Policy, 1994 under the Ministry of Energy and Water Development and as amended by;
- The National Water Policy, 2010 under the Ministry of Energy and Water Development and focus more on water resources planning, development, management and utilisation.

- The National Energy Policy, 2008 under the Ministry of Energy and Water Development that deals with energy issues.
- The Water Resources Management Act, 2011 under the Ministry of Energy and Water Development and focus more on land use, irrigation, wetland conservation, climate change and conflict management.
- The PPP policy and Act, 2009 under the Ministry of Finance and National Planning that provides a framework for the implementation of PPPs in Zambia and to promote and facilitate the implementation of privately financed infrastructure projects and effective delivery of social services.
- The Water Supply and Sanitation Act, 1997 that regulates water supply and sanitation providers (utility companies) both in terms of operations and tariff setting.

These together provide some form of environment for Private Sector Participation. For instance, the legal and institutional framework is available were the private partners could partner with the local authority in the provision of various services such as water and sanitation up to 49 percent shareholding. Unless or otherwise, this provisions are considered sufficient and accommodates both the needs of the current and potential private partners. Nonetheless, there is need to customise some of the requirements in these policies and pieces of legislation to allow for new developments and changes in the environment where need arise.

Arising from the interview analysis and results above, an Interview Interactive Model has been developed aimed at putting together the findings in relation to how they affect the overall increased effectiveness of existing PPP Models as in section 4.13 below.

4.13 Development of an Interview Interactive Process Model

The interview survey has verified responses from both the questionnaire survey and related information from the literature review. It has also brought in other factor not captured from the questionnaire survey. Based on the interview survey, the author has developed an Interactive Process Model (Figure 4.26 on page that clearly shows the relationships that subsist amongst cost, time and quality effectiveness and the identified peripheral factors. The peripheral factors were as a result of the “Other” attributes raised by the respondents in

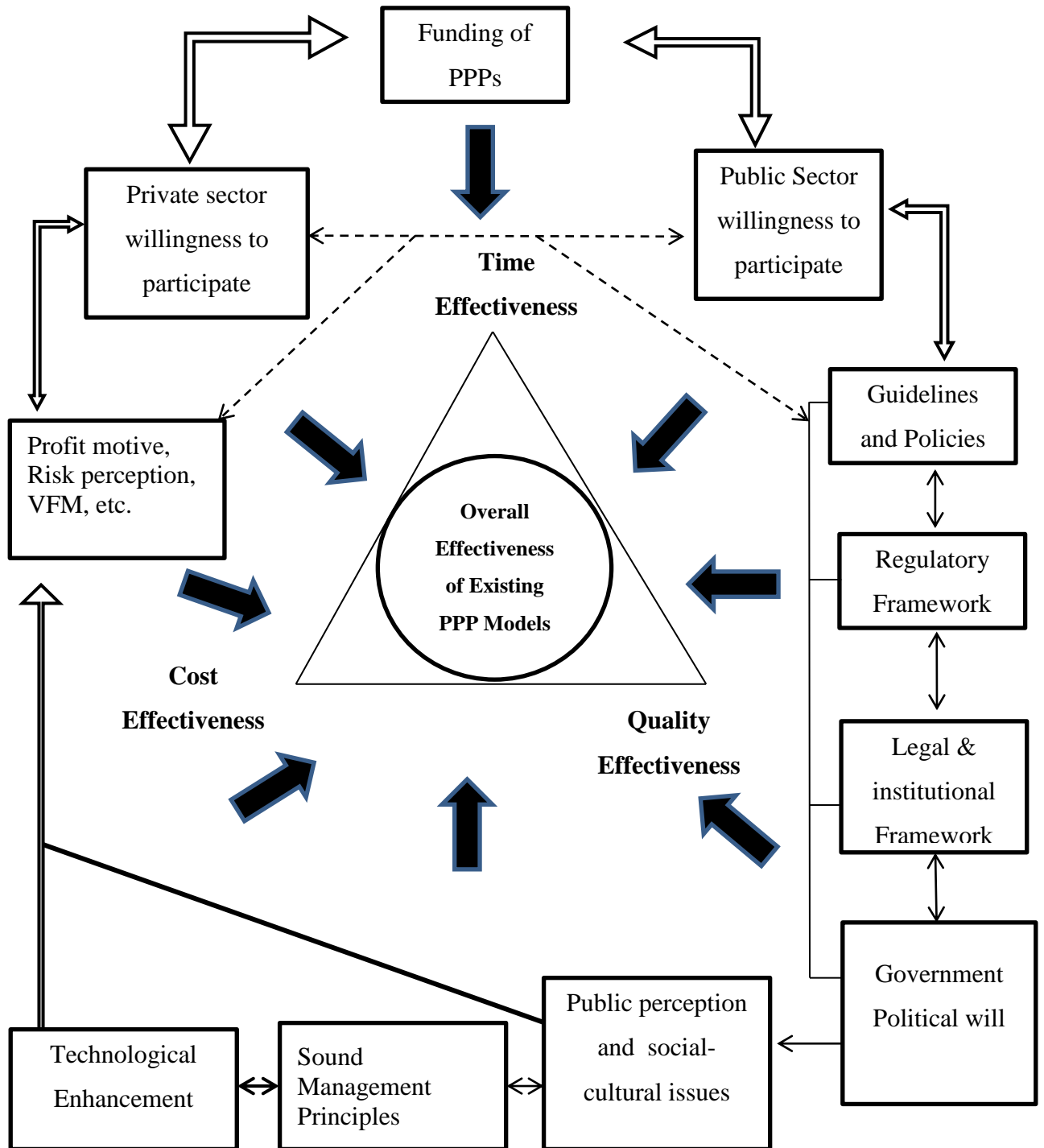
addition to the attributes reflected in the questionnaire on cost, time and quality questions as in Appendix 2. These factors were found to be critical in the introduction and implementation of PPP Models whose effectiveness is being assessed and that they could equally affect the overall effectiveness of the models. The model has been formulated with the aim of showing how cost, time and quality dimensions affect each other in achieving overall effectiveness for given existing PPP Models. Other than the cost, time and quality dimensions, the Interactive Process Model include the identified peripheral factors as captured and verified in the interview survey.

The ‘Other’ factors as identified from the questionnaire survey form part of the identified peripheral factor listed below. For instance, the TORs and condition of agreement to be well stipulated and close monitoring to ensure compliance to the agreement form part of the guidelines and policies, legal and regulatory framework and sound management principles. More investment in infrastructure and metering of households to allow pre-paid meters form part of funding of PPPs and technological factors. The involvement of the community and choosing a pro-poor model of PPP form part of Government political will, public perception and socio-cultural issues, risk aspects, profit motive and value for money. Ultimately, for any PPPs arrangement to take place and shape, public and private sector willingness to participate is cardinal.

- Funding of Public –Private Partnerships
- Public sector willingness to participate
- Private sector willingness to participate
- Guidelines, Polices, Regulatory and Legal framework
- Profit motive
- Risk aspects
- Value for money
- Public perception and Socio –cultural issues.
- Government Political will
- Technological factors
- Sound management principles

The Interactive Process Model is shown in Figure 4.26 below clearly indicating the linkages:

Figure 4.26: Interview Interactive Process Model - Relationships between cost, time and quality effectiveness and other interactive factors of PPPs as in Sections 4.4 – 4.12 above:



4.14 Summary and conclusion

It is evident from the interview survey that the PPP concept is well understood and appreciated. It also signifies the fact that PPPs are inevitable either as a means of funding or as an important strategic option in the performance enhancement and public service provision value chain. In addition to the literature review, respondents were able to reconfirm the types of PPP Models or arrangements available in Zambia and elsewhere and that they have been implemented in various sectors such as water, energy, transport, mining, education, health, agriculture etc.

Respondents expressed mixed feelings as to whether PPPs have been successful or not, though overall indications are that they have been successful especially where they have been fully implemented. The common thinking is that PPPs that have started and finished have scored some successes based on identified performance indicators such as response rates, sufficient water supply (24/7) and quality of water provided mostly due to improved infrastructure, technology and human resources skills. For those that have been terminated, there is a likelihood that they have not been successful as their termination could have been due to certain difficulties encountered in the implementation process. However, for those that are either partially completed or near completion, there is a likelihood that they could record successes or failures depending on their impact on planned deliverables. This situation is also in line with the performance of most PPPs in the Western and Central African countries that were rated as successful, partially successful or not successful at all based on their impact (Fall et al, 2009).

In line with the literature review, the survey also confirmed various sources of funding for the water utility companies as mainly coming from the Donors, Government grants, and revenue generated from user fees. The levels of funding are a source of worry considering that there is much to be done in order to effectively and efficiently respond to the higher levels of demand from the public. With old and dilapidated infrastructure, coupled with the growing population, there is need to find additional sources of financing and as a prerequisite to enhanced performance of the public sector. PPPs, community participation and listing have been identified as financing options.

PPPs are said to come with numerous benefits both to the public and private sectors. For instance, investments from the private sector would allow the public sector to release funds held up in projects that could be implemented using PPPs. Funds saved could therefore be channel to other needy areas requiring social and economic improvements. Government could also minimise the risk, if not eliminating it altogether, which is normally assumed by the private sector. Officers involved would enhance their knowledge and skills levels that are normally brought in by the private sector. Similarly, improved technology through infrastructure enhancement would enhance service provision. Service delivery would also improve in the areas in which PPPs are carried out. On the other hand, the private sector would benefit greatly from the returns arising from user fees payable to them either based on their performance or profits generated as a result of the undertaking.

The insufficient levels of funding have the potential to hinder cost, time and quality effectiveness in the process of service delivery to the public. This is because capitalisation of infrastructure requires sufficient funds and in the interim, the cost of production/operation would go up thereby prompting the operator to increase the tariffs as a way of improving the bottom line. However, with sufficient capitalisation, operations are likely to improve due to increased efficiency arising from more efficient infrastructure utilisation. This could in turn minimise the cost of operations in the long run. The tariff levels are likely to be maintained and affordable by the majority population. With increased infrastructure efficiencies, water reticulation, production, storage, and supply; billing, and response time are likely to be achieved in a timely manner leading to reduce NRW and ultimately increased revenue turnover. Similarly, with increased infrastructure efficiency, the quality of water supplied and service provision are likely to improve greatly.

While existing PPP Models could be adopted for possible use in the Zambian water and sanitation sector based on the levels of effectiveness arising from various attributes, the adoption of a particular PPP Model for implementation would depend largely on a number of factors especially those that are able to increase efficiency and effectiveness. Cost, time and quality and many peripheral factors need to be considered. It was also evident from the survey that the success of any PPP would depend on a number of factors such as government political will and commitment and generally operating an arm's length kind of policies in order to allow the partnership operate in an environment that is acceptable by both partners.

There is need to have sufficient legal and regulatory frameworks that allow for PPPs to operate in a conducive environment in order to encourage private participation. However, it is evident from the literature review and survey that Zambia has sufficient legal and regulatory frameworks though there is still room for improvement. Public sector perceptions and cultural issues, sound management principles and technological improvements could also assist in determining the success rates.

Chapter Five

5.0 CONCEPTUAL BETA MODEL FOR EXISTING PUBLIC-PRIVATE PARTNERSHIP MODEL FOR INCREASED EFFECTIVENESS IN THE ZAMBIAN WATER AND SANITATION SECTOR.

5.1 Introduction

As alluded to in the literature review, models are convenient worlds and simplified abstraction of reality thus modelling attempt to make sense of strategic vision (Pidd, 2003) and according to Boothroyd (1978 cited in Pidd 2003, p. 1), models are part of a process of “reflection before action”. Pidd (2003) writes that when we model, we put reality into context as a model represents reality intended for some definite purpose. The Conceptual Beta Model can therefore aid in coping with change and turbulence (Pidd, 2003) and enhance value addition in the provision of water and sanitation services.

This chapter endeavours to develop a Conceptual Beta Model arising from the Conceptual Alpha Model in Part A of Chapter 4 to signify how the use of existing PPP Models could increase effectiveness in the development of the Zambian Water and Sanitation Sector taking into account results from semi-structured interviews.

5.2 Logic and Reasoning in Developing the Conceptual Beta Model

The logic behind the development of the Conceptual Beta Model follows from the Conceptual Alpha Model that took into account the various dimensions used to increase effectiveness in the provision of water and sanitation services in Zambia. As a result, semi-structured interviews were conducted in order to obtain collaborative data from selected PPP experts. The Conceptual Beta Model therefore aims at developing further the logic exhibited in the Conceptual Alpha Model in order to develop further the proposition. The proposition is based on the assertion that existing PPP Models could be used to increase effectiveness of dimensions of cost, time and quality in the development of the water and sanitation services in Zambia. While the dimensions of cost, time and quality were used in the Conceptual Alpha Model in Part A of Chapter 4, the Conceptual Beta Model takes into account the

peripheral factors considered critical in ensuring increased effectiveness side by side with dimensions of cost, time and quality. In other words, existing PPP Models could only be most effective (be able to achieve the intended results) when both the dimensions of cost, time and quality and peripheral factors are used together in order to see a much more meaningful effect or impact.

The Conceptual Beta Model could be used as a problem solving technique to adding value to the dispensation of the water and sanitation services in Zambia particularly in relation to increased effectiveness using factors of cost, time and quality. While various models could be used in strategic decision-making, Nilsson (2008) and Bolanos et.al. (2005) used interpretive structural modelling and analogising respectively. According to Nilsson (2008), the use of analogy occurs in problem setting, problem solving, actions and sense making modes. On the other hand, Bolanos (2005) notes that in order to improve group decision making, interpretive structural modelling could be used in the clarification of the perception of different individuals in a managerial group. The Conceptual Beta Model is developed on the basis that managers and implementers would opt to use the model as a strategic decision making process requiring the use of the adopted existing PPP Models for increased effectiveness in the development of the Zambian Water and Sanitation Sector.

It is also worth noting here that, depending on the technique used, partial solutions could be found and implemented whereas in some cases, a total failure arising from poor strategic choices and /or ineffective problem solving techniques. It is also true that providing timely solutions to strategic problems in turbulent environments is cardinal to gaining a strategic advantage for any organization. Mitroff (1999 cited in Keating et al., 2001, p. 772) suggests that since real problems are unstructured and arbitrarily bounded, their resolution requires systemic inquiry. Similarly, Harrison and Pelletier (2001) has demonstrated that a process model of decision making is conducive to strategic decision success but also acknowledges that decisions are highly complex and involve a host of dynamic variables.

The notion of bounded rationality as proposed by Simon (1969; 1979; and 1982 cited in Harrison & Pelletier 2001 p. 171) and alluded to by Pidd (2003) acknowledges the limitations in human rationality especially when operating in conditions of uncertainty and risk. It is therefore assumed that the Conceptual Beta Model developed based on the tested

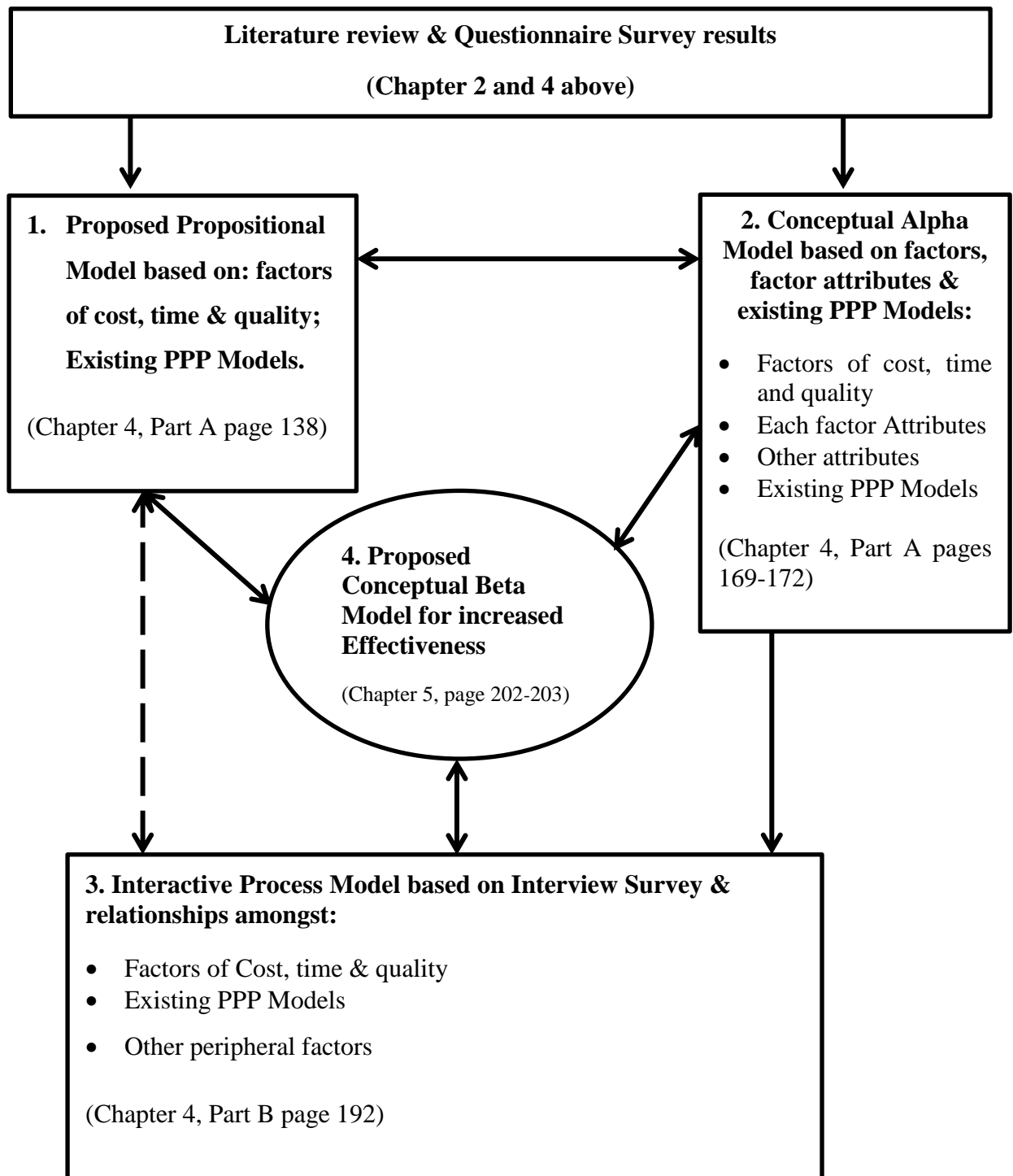
and verified proposition could act as a problem solving technique and assist in resolving the strategic problem in question. As part of problem structuring, Pidd (2003) writes that it carries with it the idea that problems are malleable and can be modelled into a variety of shapes and forms and according to Smith (1968 & 1989 cited in Pidd 2003, p. 66), we need methods to increase our success and as John Dewey (unknown cited in Pidd 2003, p. 64) says, a problem well put is half-solved.

The Conceptual Beta Model develops an appreciation and understanding that models are “tools for thinking” in the overall context of strategic thinking and strategic decision making. It provides a deeper understanding of the modalities that may be involved in finding a possible solution to the use of existing PPP Models for increase cost, time and quality effectiveness in the development of the Zambian Water and Sanitation Sector.

5.3 Summary Model Structure

As part of Beta Model development, the questionnaire and interview surveys undertaken have revealed that existing Public –Private Partnerships Models can be used to increase effectiveness in the Zambian Water and Sanitation Sector based on cost, time and quality dimensions at different levels. Initially, three (3) Models were developed as part of the process leading to the development of a final Conceptual Beta Model. From the literature review information and questionnaire survey results, a Propositional Model (section 4.2.4 page 138) was proposed incorporating the independent factors of cost, time and quality and the dependent factor increased effectiveness represented by Existing PPP Models. This Propositional Model depicted a framework on how a Conceptual Alpha Model would be represented after the responses and analysis of views from the respondents. The Conceptual Alpha Model (section 4.3, page 164) was then developed to include the various attributes that support cost, time and quality factors rated at different levels based on mean value ranking positions. From the interview survey, an Interview Interactive Process Model (section 4.13, Figure 4.26 page 193) was developed taking into account results from the questionnaire. The Interactive Process Model brought in another dimension whereby the three independent factors were related including the peripheral aspects that would affect the process of introducing existing PPP Models. The three (3) Models describe above have been summarised in Figure 5.1 below and termed as a Summary Model Structure.

Figure 5.1: Summary Model Structure - Linking Models towards the development of the Beta Model and Interrelationships amongst them.



As in Figure 5.1 above, the Summary Model Structure puts together all the preceding models developed whose input culminates into the development of the Conceptual Beta

Model. It depicts the reasoning involved in developing each of the Models, the linkages and relationships amongst them as explained below.

The literature review acts as a source of information that feed into the questionnaire survey and leading to the determination of the proposed Propositional Model using cost, time and quality as independent factors and Existing PPP Model(s) as dependent factor(s). The proposed Propositional Model (as in section 4.2.4) was developed to indicate how existing PPP Models could increase effectiveness of dimensions of cost, time and quality including ‘Other’ factors. The dimensions and ‘Other’ factors are important in the development of the Alpha and Beta Models. The results from the questionnaire survey assisted in the determination of increased effectiveness of independent factors. These together with the input from the proposed Propositional Model enabled the development of the Conceptual Alpha Model that includes cost, time and quality factors; factor attributes; “Other” attributes and Existing PPP Models as in section 4.3 above.

Taking into account responses from the interview survey, an Interactive Process Model is then developed to assist in the perfection of the Model and as a way of verifying the responses from the questionnaire survey. The Interactive Process Model (as in Figure 4.26, page 193) takes into account the interaction amongst factors of cost, time and quality in relation with the Existing PPP Models and in a way to synergistically increase the overall effectiveness. The peripheral aspects (as deduced from the interview in sections 4.4 – 4.12) that may be involved in the process of introducing PPP Models could also impact on the overall effectiveness either directly or indirectly. These include aspects of funding for infrastructure development and/or enhancement; public and private sector willingness to participate; guidelines and policies, regulatory and legal frameworks; Government political will; public perception including social-cultural issues; private sector profit motive, aspects of risk and value for money; sound management principles; and technological improvements.

In summary, the proposed Propositional Model synergises with the Conceptual Alpha Model and both the Propositional Model and Conceptual Alpha Model feed into the Conceptual Beta Model (developed in section 5.4 below) but also providing a synergistic effect amongst the three Models. The conceptual Alpha Model feeds into the Interactive Process Model

which in turn feeds into and interacts with the Conceptual Beta Model. In other words, the summary Model Structure provides linkages from the literature review and questionnaire survey results to the Conceptual Beta Model developed in section 5.4 below.

5.4 Development of Beta Model

As indicated in section 5.3 above, in developing the Conceptual Beta Model for increased effectiveness, the proposed Propositional Model, the Conceptual Alpha Model and the Interactive Process Model have been taken into account as they feed into each other and share related information. Refer to Figure 5.1 above.

The Conceptual Beta Model clearly indicates that there is some form of symbiotic relationship that subsists amongst the three independent factors of cost, time and quality. As such, the increased effectiveness that is likely to be induced through each independent factor is likely to affect the overall effectiveness. Squeezing any of the independent factors, say time, is likely to create pressure on the other two and similarly in the same manner using other factors.

The attributes of each independent factor remain an altered from the Conceptual Alpha Model. Nonetheless, the Model also shows that both the cost, time and quality dimensions and their respective attributes would be affected by the peripheral factors. Similarly, the peripheral factors are likely to affect the overall effectiveness arising from the independent factors.

Overall, all existing PPP Models are likely to increase effectiveness at different levels based on mean value ranking positions though ultimately and based on the respondents' opinions and views, increased effectiveness on dimensions of cost, time and quality are likely to follow their rankings (most suitable to least suitable) as in Chapter 4 Part A.

Figure 5.2 shows the typical Conceptual Beta Model that has been developed and further summarised in Figure 5.3 based on the interview Interactive Process Model arising from the interview survey which in a way encompasses all the details as in Figure 5.2.

Figure 5.2: Conceptual Beta Model with attributes that increase Cost, Time, and Quality effectiveness in order of their mean value ranking positions, overall effectiveness and peripheral factors of PPPs.

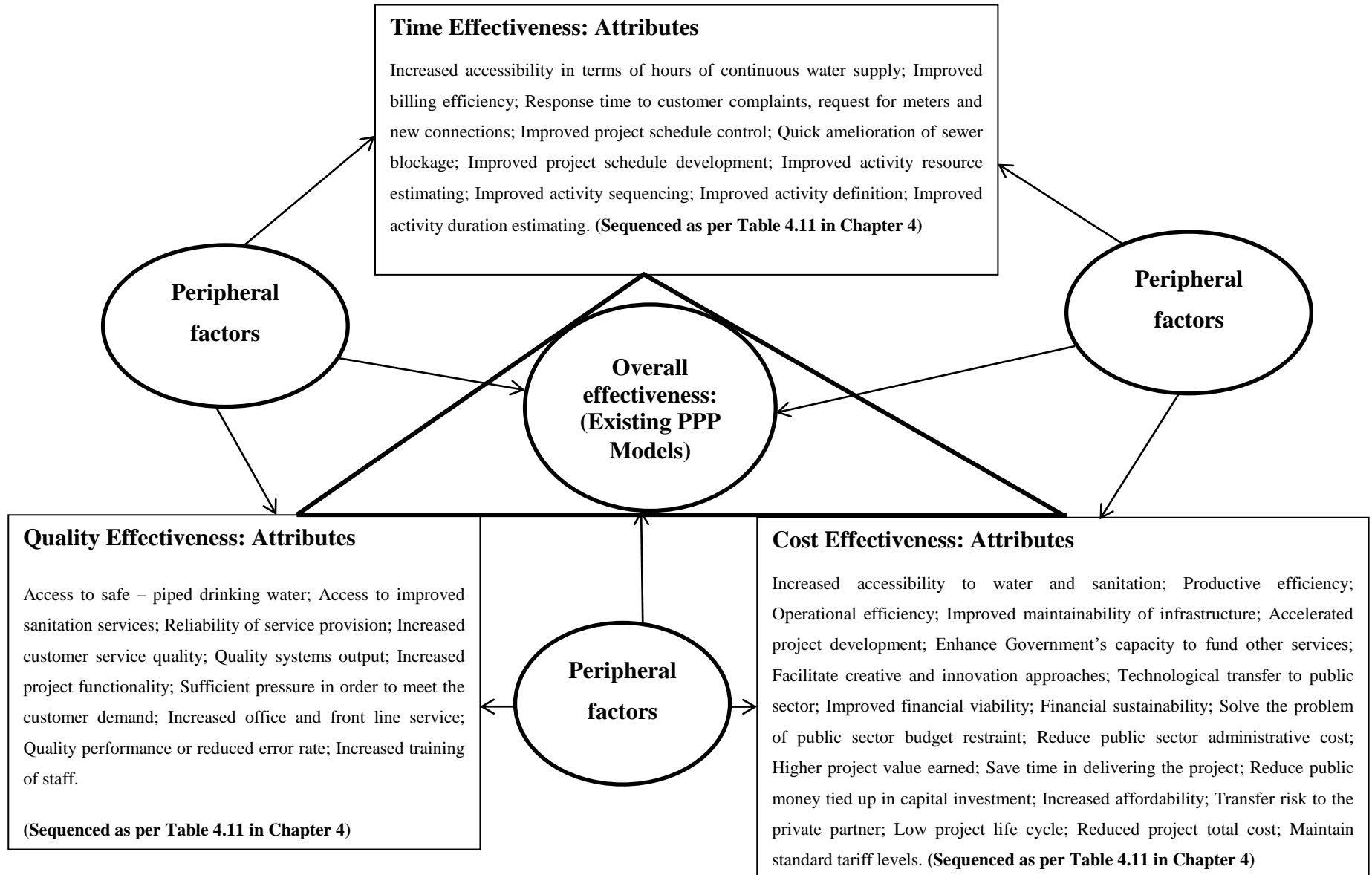
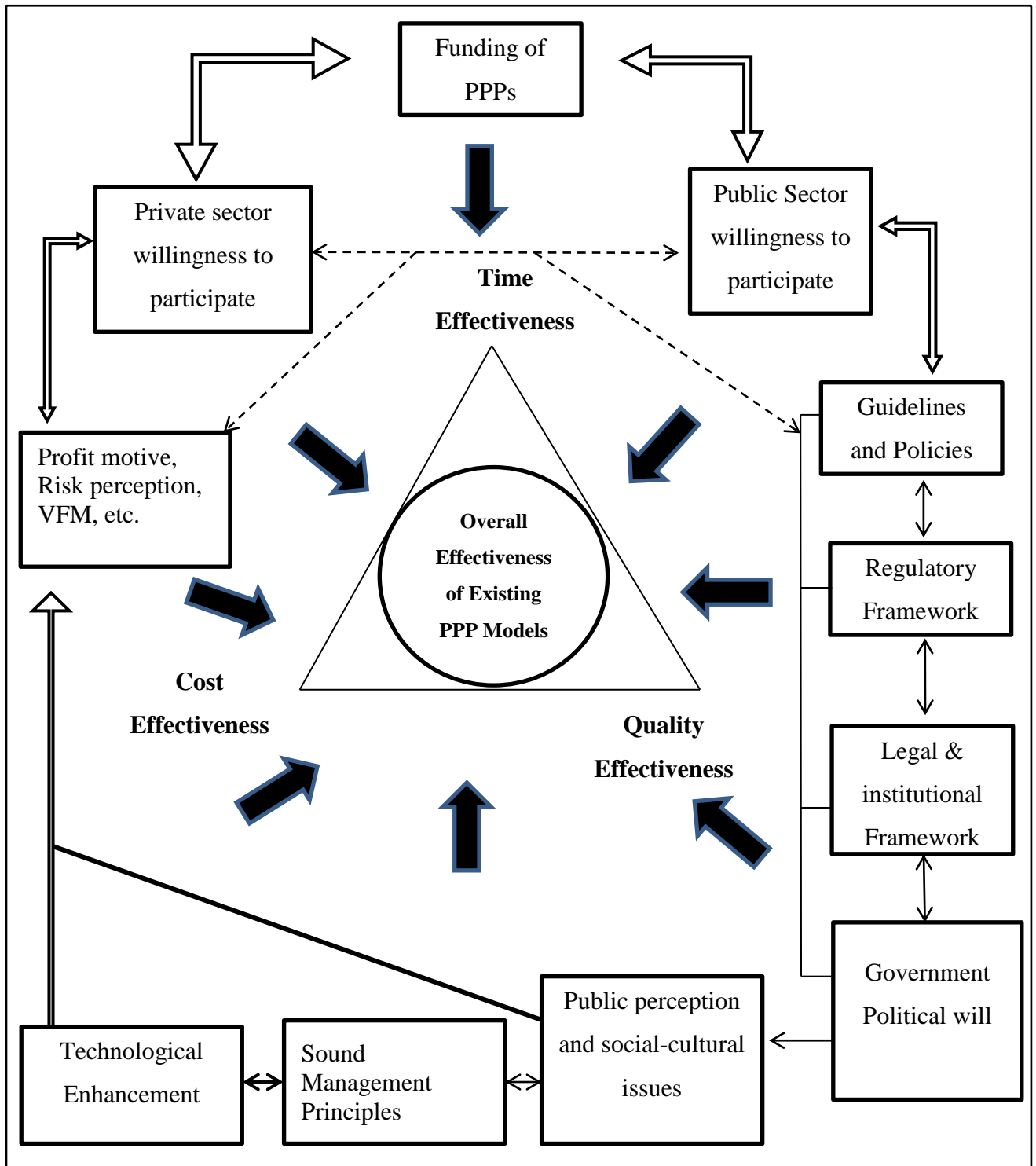


Figure:5.3: Summary of Conceptual Beta Model – showing relationships between cost, time and quality effectiveness, overall effectiveness and peripheral factors of PPPs (Summary of Figure 5.2 in line with Figure 4.26 above).



5.5 Discussions and Conclusions

Based on the results from the questionnaire survey, respondents were of the view that all the factors could increase existing PPP Models effectiveness at varying levels of significant. A proposed Propositional Model for increased effectiveness was then developed to signify how the model of increased effectiveness would look like using the independent factors of Cost, Time, and Quality and dependent factor of Existing PPP Model(s) as presented in Figure 4.11 on page 139. Arising from the proposed Propositional Model, a Conceptual Alpha Model was then developed taking into account all attributes that increased Cost, Time and Quality effectiveness at various mean values and incorporated “Other attributes” that arose from respondents’ comments as in Figure 4.19A – 4.19D on pages 169 - 172.

“Other attributes” were reviewed and verified during the interview survey that eventually feed into the peripheral aspects that arose from the interviews. An Interactive Process Model (Figure 4.26 page 193) was then developed from the interview survey aimed at verifying the results from the questionnaire survey and gather additional information that could not be captured during the data gathering process using the questionnaire. Based on the results from the interview survey, it was established that in fact, there is an interactive kind of relationship, not only amongst the three independent factors whose effectiveness could be increased by existing PPP Models, but also amongst other factors critical for the introduction of Existing PPP Models such as financing of PPPs; public and private sector willingness to participate; guidelines and policies; regulatory, legal and institutional frameworks; Government political will; profit motive; risk perception; value for money; public perception and social-cultural issues etc. These were considered critical in coming up with a Conceptual Beta Model. A Summary Model Structure (Figure 5.1 page 200) linking all developed models was then developed clearly showing how all the models feed into and synergises each other to allow the development of a Conceptual Beta Model for increased effectiveness.

The Conceptual Beta Model (as in Figure 5.2 page 203) was then developed showing the independent factors and their respective attributes and how they independently and together affect the overall effectiveness of the preferred existing PPP Models and the effects from the peripheral factors of PPPs. A summarised Conceptual Beta Model for increased overall effectiveness is provided in Figure 5.3 above. It could be deduced from the discussion that in

each of the models developed, there are some similarities that feed into subsequent models developed.

5.5.1 Operationalizing the Proposed Conceptual Beta Model

In operationalizing the proposed model, it is the author's view that a better understanding of how each independent factor independently and overall affect the dependent factor is appreciated and would be critical in the initiation and implementation of Existing PPP Models. For instance, the attributes used in the determination of increased effectiveness are positioned at different mean values and ranking positions. This would be important in the planning and implementation of activities and/or tasks that would be associated with the various attributes in question.

Similarly, the identified peripheral factors in the Conceptual Beta Model should be considered important in ensuring Existing PPP Models effectiveness. It would also be important to take into account some of the challenges peculiar to developing nations like Zambia that would make the use of existing PPP Models for increased effectiveness difficult in the development of the Zambian Water and Sanitation Sector. These include aspects of higher poverty levels, lower disposable incomes, underdevelopment for both human and economic, cultural issues, inefficient systems and lack of latest technologies among others. Specifically, the following strategic process is proposed in a bid to operationalize the Conceptual Beta Model.

(a) There is need to review the current arrangement of water and sanitation provision by water utilities from the effectiveness point of view before charting a way forward to re-engineer the water and sanitation provision based on the proposed model.

Currently, the water and sanitation sector is vested in the commercial utilities dotted across the nine (9) provinces of Zambia and operating on a commercial basis to provide and deliver water and sanitation services. Nonetheless, this has not worked to the expectations and satisfaction of the Government and the public. In other words, there has been less value addition to the needs and requirements of the consumers in as far as water and sanitation services are concerned.

Intermittent water supply continues to be the order of the day coupled with poor quality and service delivery. This amounts to reduced access to water in terms of hours of continuous supply; reduced access to improved sanitation; reduced access to safe-piped drinking water and generally poor service provision arising mainly from production and operational inefficiencies. These have arisen mainly due to dilapidated infrastructure that have not seen sufficient capitalisation or maintained for a long time.

Most new and potential developments have no access to piped water and sewer lines and where they do have, it normally takes longer durations for the service to be provided. Effectively, this entails that most residential and commercial users of the commodity have to rely on boreholes, shallow and contaminated water for drinking and commercial use and septic tanks for waste disposal. These in turn bring about numerous challenges in terms of poor quality of water arising from turbidity, uncontrolled iron content and contamination thereby inducing numerous water borne diseases such as diarrhoea, typhoid, dysentery etc.

The reasons for this has mostly been due to poor or non-functional infrastructure needed for the reticulation, production, storage and distribution of the commodity and sewer affluent. The poor infrastructure is coupled with unsustainable levels of funding thereby inhibiting meaningful capitalisation. Operational costs are normally very high, the provision of services is not timely and more often the service providers exhibit low levels of quality standards. This eventually leads to water utility companies being less effective and efficient in the delivery of water and sanitation services.

The review will allow the Government and stakeholder (with both direct and indirect interest in the water and sanitation service provision) to re-engineer the manner in which the water and sanitation provision should be effectively and efficiently provided in a bid to enhance the social and economic development of the country. In carrying out the review, it is proposed that the following be taken into account.

- The proposed existing PPP Models for increased effectiveness from the value addition and enhancement point of view. Value addition would entail reviewing

the value chain that may include aspects of Value for Money in terms of economy and efficiency in the manner water and sanitation services are provided. Economy in terms of minimising the cost of resources and efficiency as a result of performing tasks with reasonable effort possibly due to improved technology.

- The overall increased effectiveness arising from the dimensions of cost, time and quality using the existing PPP Models in question.
- Consider the willingness by both the public and private sectors to participate in the provision and supply of water and sanitation services using existing PPP Models.
- The adequacy of the available guidelines and policies, regulatory, legal and institutional frameworks as they relate to the provision and supply of water and sanitation services. If gaps are identified, work towards harmonising them as a way of improving on the already existing enabling environment.
- Consider Government preparedness in terms of political will and willingness to accommodate private sector participation.
- Consider aspects of profit motive from the private sector point of view knowing that the private sector are known for making profits other than being pro-socio oriented; the risk perception relating to the use of existing PPP Models in the development of the Zambian Water and Sanitation Sector and public perception and social-cultural issues.
- Involve all stakeholders with both direct and indirect interest such as Donors and the communities in respective locations whose input is critical for the purpose of support and preparedness to change.
- Decide on which commercial utilities should be available for Concession and/or any other Model for piloting purposes. This should be mainly based on geographical locations. For instance urban areas could be considered for Concession contracts and/or Affermages while the peri-urban could be considered for Service contracts. This strategy is based on pro-poor kind of arrangement. While Management contracts in Zambia have not been termed as PPPs formally, this model seems to have failed.

- Consider the needed technical know-how and skills levels available to facilitate the initiation and implementation of the adopted strategies. Here, resistance may be experienced depending on the manner in which the whole exercise is done.

In other words, and as part of the conceptual process model, need may arise to look at what has been proposed in the Conceptual Beta Model and compare it with what is obtaining on the ground (the systems view and real world view). The identified gaps could therefore be used in the planning process to ensure successful implementation of the process model.

(b) Arising from the review above, develop a road map.

Ideally, the road map should clearly indicate how the various events would be initiated and undertaken and how the events link into each other if any. This should result into a logical framework with clearly identified programmes and activities, expected inputs and outputs, overall purposes and goals to which all initiated programmes and activities should contribute as a result of initiating and implementing any of the adopted existing PPP Models. The logical framework should be translated into an implementation schedule clearly showing the timelines and resource availability needed for successful implementation of the proposed road map.

Distinct work plans would need to be developed, with resources clearly allocated in terms of human capital, materials and finances. Activities should be well scheduled in order to reflect clear time lines during which each activity is supposed to be carried out.

(c) Sensitise the public on the need to buy in the new developments.

Apart from the public being part of the stakeholder involvement in the review process of the proposed model of increased effectiveness in the Zambian Water and Sanitation Sector, the need to sensitise the general public is a critical pedagogical aspect in ensuring that they buy in the new developments that would affect their social wellbeing and the way they look at things. This would assist in dealing with the perception in terms of the motive behind the strategy and address some of the social and cultural aspects that may conflict with well-intended strategic intentions. There should be effective communication

across all stakeholders to ensure timely dissemination of information. Lack of it will act as a roadblock to effective communication.

(d) Carry out a few pilot projects

In order to make the strategy work to expectation or near expectation, a few pilot projects would be inevitable. Carrying out a few pilot projects would act as a hedging strategic for failure likely to arise from perceived systematic risks that cannot be diversified easily. The strategy to pilot which adopted PPP Models should be based on among others the population demography, income distribution and the levels of disposable income. Where disposable income are considered better, a Concession contract pilot project would be ideal and vice versa. This will in a way assist in making the dream come true.

(e) Establish a Monitoring and Evaluation Unit/Team

It is essential that a proper Monitoring and Evaluation Unit is established to spearhead the monitoring and evaluation activities aimed at assessing performance. An ideal criteria on how the monitoring and evaluation should be conducted should be established for the smooth implementation of the PPP Models. Poor monitoring and evaluation would render stakeholders not knowing the levels of performance attained in the process and should act as benchmarks for decision-making. Monitoring and evaluation would ensure that both feedback and feed forward loops are created and act as media for communication and prompt decision – making. In this way, corrective measures would easily be taken and lessons learned therefrom used to feed forward into future processes. The act of coordination and collaboration would be ensured for successful project implementation.

In conclusion, the Conceptual Beta Model provides another platform on which cost, time and quality effectiveness could be increased and allow improved levels of service delivery. It depicts how existing PPP Models could be used to increase overall effectiveness as represented by dimensions of cost, time and quality. As part of an elaborate process and road map, it is proposed that pilot projects be initiated through the introduction of the preferred existing PPP Models preferably Concession contracts in urban areas and Service contracts in

the peri-urban or rural areas of the country. In doing so, it is expected that service provision would improve drastically and eventually enhance the social-economic wellbeing of the citizenry. The proposed Conceptual Beta Model could be used by paying much attention to attributes that increase cost, time and quality effectiveness and more importantly, the most suitable PPP Model as ranked by the respondents. These are considered to be critical pedagogical aspects in the model and by not doing so or optimising these attributes would render the overall effectiveness of using the preferred existing PPP Models to go down. Similarly, the peripheral factors identified and verified during the interview survey should equally be monitored and evaluated with the same vigour as the other attributes representing cost, time and quality factors.

This calls for a robust monitoring and evaluation mechanism that would ensure that the various action plans developed towards ensuring effectiveness are implemented. The attributes should be used as Key Performance Indicators (KPIs). With the infusion of the private sector, it is assumed that financing would be improved on thus allowing sufficient capitalisation of the infrastructure, improved cash flows, efficiency and effectiveness and eventually create an enhanced value chain in the service provision circle.

It is hoped that what is embedded in the Conceptual Beta Model would suffice to a greater extent in dealing with the problem at hand. According to Pidd (2003), it carries with it the idea that problems are malleable and can be modelled into a variety of shapes and forms, and according to Smith (1968 & 1989 cited in Pidd 2003, p. 66), we need methods to increase our success. Similarly, John Dewey (Unknown, cited in Pidd, 2003, p. 64) said a problem well put is half-solved. The researcher believes that the proposition has been well put and the sector should be able to record some success if well implemented.

Chapter Six

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

6.1 Summary of Research

The research clearly demonstrates that the Zambian Water and Sanitation Sector is faced with a number of challenges ranging from inadequate water supply and sanitation to quality issues. These challenges date as far back as 1964 when Zambia became independent and have rendered the country to remain underdeveloped. For a period of more than 48 years now, the Zambian population has continued having an erratic water supply or no supply at all, coupled with poor quality of the commodity. These in turn have contributed much to the present major barriers to social and economic development facing the urban, peri - urban and rural populations of Zambia thereby impeding human development. Zambia can therefore be referred to as underdeveloped as the majority of its citizens are considered to be exposed to poor living conditions and do not have capacities and choices for basic needs for livelihood survival such as water and sanitation.

Underdevelopment refers to an economic situation characterized by persistent low levels of living in conjunction with absolute poverty, low income per capita, low rates of economic growth, low consumption levels, poor health services, high birth and death rates, dependence on foreign economies, and limited freedom to choose among activities that satisfy human wants (Todaro & Smith (2011). These are some of the problems Zambia is facing and the provision of sufficient water and sanitation could assist to remedy the situation. Human development is a process of enlarging people's choices by expanding human capabilities and functioning, allowing them "greater access to knowledge, better nutrition and health services", necessary to promote long and healthy lives, to be knowledgeable and have a decent standard of living (Qureshi, 2007). It is therefore a fact that inadequate provision of quality water supply and sanitation is likely to impede human development and to be a recipe for an unproductive society. This is also true in that the social and economic success is largely dependent on the provision of water and sanitation henceforth the key to a healthy population, national productivity and wealth creation. This calls for a robust national

strategy such as the use of PPPs arrangements, in this case, aimed at improving the provision of water and sanitation services through the use of corroborative efforts of both the public and private sectors. This is despite Zambia's large water resource base in terms of surface water and sufficient annual renewal ground water potential. Similarly, the country's Gross Domestic Product and Per Capital Income cannot sufficiently support the required social and economic development. The statistics as provided in the introductory chapter alludes to these facts. There is need therefore to strategize and ensure that factors that impede on the social and economic development are sufficiently addressed in order to enhance growth prospects.

In order for Zambia to provide the needed social amenities for enhanced public service delivery, additional resources in terms of Balance of Payment (BoP) are required to supplement the meagre internally generated resources. This simply entails that Zambia cannot generate sufficient income from taxes to assist mitigate the deficit in the levels of expenditure. With the proposed Conceptual Beta Model aimed at improving existing PPP Models effectiveness in the development of the water and sanitation sector, more PPPs could be initiated and implemented and value addition enhanced. More jobs could be created thereby increasing the tax base and ultimately improved income from taxes and eventually minimise the expenditure deficit.

Although Zambia has engaged herself in some form of Public – Private Partnerships in other sectors, this has not been the case in the Water and Sanitation Sector. This entails that in the absence of a near permanent solution to the water and sanitation malaise, Zambia cannot sufficiently enhance public sector performance especially in the provision and delivery of water and sanitation services. The ripple effect is that you have unhealthy citizens who cannot be productive thereby hindering economic growth. While the Government has made strides by creating some water utilities companies predominantly in the urban population, the lack of sufficient water supply and sanitation still remain a challenge to both the urban and rural population. The quality of the commodity still leaves much to be desired especially in the peri-urban and rural parts of the country. This has been mainly due to dilapidated infrastructure and lack of new investments to cater for the growing population and emerging areas that needs totally new investments.

The Zambian Government and the private sector need to utilise the existing Public - Private Partnerships Models, available policies, guidelines, regulatory, legal and institutional frameworks to create partnerships in the water and sanitation sector in a bid to ensure quality service delivery and sufficient provision of water supply and sanitation. The Public - Private Partnerships should be used as strategic option aimed at enhancing the performance of the water sector in terms of increased effectiveness and ultimately accelerated economic growth, development and infrastructure delivery.

The research aimed to develop a Public Private Partnerships (PPPs) Conceptual Model in order to conceptualise the PPP Models increased effectiveness in the development of the Zambian Water and Sanitation Sector using existing PPP Models and results from the sector respondents. The research was divided into four main Stages:

Stage 1 - literature review and consultation to establish PPPs context, purpose and perspective; identify and review the existing PPP Models and their applicability to both the water and sanitation sector and other sectors.

Stage 2 – required the use of a questionnaire survey aimed at obtaining views of respondents and to provide a foundation to enable the determination of the preliminary Alpha Model.

Stage 3 – required the use of interview survey to subject the preliminary results to further verification in order to enable the determination of Beta Model.

Stage 4 – Based on stages 2 and 3, to develop a Conceptual Beta Model, its refinement and verification.

The findings in Stage 1 of the literature review and consultations confirmed that the PPP concept and Models are widely used in many sectors and thus applicable to the water and sanitation sector as well. Some existing PPP Models have been used dating as far back as the 16th century in the UK, 1940s for France and 1949 for Western and Central Africa. In many developed and developing countries like Zambia, PPPs have been and/or being initiated and implemented in various sectors of the economy such as agriculture, mining, transport, energy and construction. Various reasons, benefits and arguments have been advanced and mixed levels of performance alluded to for venturing into PPPs.

The findings in Stage 2 of the questionnaire survey were based on respondents' views and opinions that allowed the development of a Propositional Model (as in Figure 4.11, section 4.2.4 on page 139) to signify how existing PPP Models could increase effectiveness of dimensions of Cost, Time and Quality. The Propositional Model culminated into the development of the Conceptual Alpha Model that signified that all the existing PPP Models could increase effectiveness of dimensions of cost, time and quality at different levels of impact based on mean value ranking positions (Chapter 4, Part A: Figures 4.19A – 4.19D, page 169-172).

The sample was obtained mainly from the water utilities and selected respondents from various stakeholders in order to enrich the study. Data was corrected in order to determine among others knowledge levels of PPPs and sectors in which PPPs have been implemented or being implemented; the PPP arrangements best suited in the Zambian Water and Sanitation Sector and ultimately to determine the extent to which the most suitable ranked existing PPP Model could increase effectiveness of dimensions of cost, time and quality.

On knowledge level of PPPs and sectors in which they have been implemented in Zambia and/or elsewhere, results indicate that respondents' have acceptable levels of knowledge. However, results vary considerably from sector to sector with knowledge in the water and sanitation, waste management and construction sectors rated higher than the rest. Nonetheless, the lower ratings on others are an indication that PPPs are developing in Zambia and elsewhere despite having none in the water and sanitation sector.

On the PPP arrangements that would be best suited in the Zambian Water and Sanitation Sector, results indicate that Concession contracts have been ranked first and the most suitable based on frequencies, percentages and mean value ranking positions as in Figures 4.7, 4.8, 4.9 and 4.10 and Table 4.2. However, based on a similar criteria, Management, Affermages and Service contracts were ranked second, third and fourth respectively and in terms of suitability. Nonetheless, the author attributes the respondents' ranking pattern or preferences to the theory of project investment appraisal and economic theory in as far as what motivates individual investors to invest their capital in certain projects than others.

As in determining the extent to which the most suitable ranked existing PPP Model could increase effectiveness of dimensions of cost, time and quality, results indicate that though levels of significant vary according to respondents' perceptions, all the existing PPP Models could increase effectiveness of the dimensions at various levels of impact as depicted in Figures 4.19A, 4.19B and 4.19C. In essence, increased effectiveness is depicted by their respective levels of impact as signified by the high, medium and low mean values and ranking positions. In other words, Level 1 of the Conceptual Alpha Model signifies respondents' higher preference in terms of ratings (rated highly) thus signifying a higher impact in as far as increased overall effectiveness is concerned. This is followed by Level 2 and Level 3 being the least.

It could therefore be deduced from the above stated results that the Conceptual Alpha Model represents existing PPP Models increased effectiveness of dimensions of cost, time and quality at three (3) levels based on mean values and ranking positions. Table 4.11 on page 139 clearly indicates how the effectiveness of dimensions of cost, time and quality could be increased based on high, medium and low mean values and ranking positions.

Each of the existing PPP Model namely "Concessions, Affermages/Lease, Management and Service contracts" are said to be affected independently by each of the dimensions and in collaboration with each other. A Conceptual Alpha Model was then developed as in Figures 4.19A – 4.19C and summarised in Figure 4.19D clearly showing the factors and their respective attributes and linkages to the existing PPP Models.

The findings in Stage 3 from the interviews were based on responses from experts and used in the development of an Interview Interactive Process Model as in Figure 4.26 on page 193 to signify how existing PPP Models interact with dimensions of Cost, Time and Quality and other peripheral factors. The Interview Interactive Process Model culminated into the development of the Conceptual Beta Model that authenticates that all the existing PPP Models could increase effectiveness of dimensions of cost, time and quality at different levels of impact based on mean value ranking positions (Chapter 4, Part B) couple with other peripheral factors. Data was corrected in order to verify 'Other' factor arising from the questionnaire survey and also deduce other peripheral factors (if any) that may impact on existing PPP Models increased overall effectiveness.

Similar, the semi-structured interviews were used to verify and authenticate issues that arose from the questionnaire survey and any other aspects aimed at beefing up the results from the experts. The views and opinions of PPP experts on PPPs and what they considered to be the critical success factors to ensure private sector participation and success were explored in detail. The interview survey provided richness of data and information based on respondents' experiences on PPPs including other aspects that would affect the existing PPP Models overall effectiveness other than dimensions of cost, time and quality. The following summary results were achieved from the interviews:

- The PPP concept is well understood and appreciated but also inevitable as a strategic option in the performance enhancement of the public sector. Respondents also reconfirmed the types of PPP Models as in the literature review and that they have been or being implemented in Zambia and elsewhere.
- Respondents expressed mixed feelings on whether PPPs have been successful or not though overall indications are that they have been successful especially where they have been fully implemented.
- Respondents also reconfirmed the sources of funding for water utility companies in Zambia, mainly coming from the Donors and small portions from Government grants and user fees. This signifies that funding for the sector is insufficient and likely to hinder increased effectiveness of cost, time and quality dimensions.
- Respondents reconfirmed the benefits arising from PPPs both to the public and private sectors. For instance, the public would benefit from funds released by the private sector for investment thereby allow the public sector to release funds held up in projects that could be implemented using PPPs and channelled to other needy areas requiring social and economic improvements. Other benefits would include minimised risks; knowledge and skills enhancement and improved technology. On the other hand, the private sector would benefit from the returns arising from user fees thus enhance their financial performance.
- Respondents were of the view that in order to increase overall effectiveness of existing PPP Models in question, there is need to consider other peripheral factors other than dimensions of cost, time and quality such as political will and commitment; ensure sufficient legal and regulatory frameworks to encourage private sector participation; take

into account public sector perceptions and cultural issues; sound management principles and technological improvements.

In order to facilitate the development of a Conceptual Beta Model, a Summary Structure Model (Figure 5.1 on page 200) was developed clearly showing how each of the developed models fit into each other before the development of the Conceptual Beta Model shown in Figure 5.2 on page 203. The Summary Structure Model includes the proposed Propositional Model; the Conceptual Alpha Model; the Interactive Process Model and the Proposed Conceptual Beta Model. The Conceptual Beta Model was then developed to signify the final process model that was subsequently summarised using the Interactive Process Model as a basis as in Figure 5.3 on pages 204.

Overall, the main findings from both the questionnaire and interview surveys undertaken are summarised below:

- (a) According to the respondents, and based on the questionnaire survey, all the existing PPP Model are likely to increase effectiveness of dimensions of cost, time and quality in the case of the development of the Zambian Water and Sanitation Sector though at different levels of impact. This is based on the respondents' views and opinions justified by a response rate of about 60% of the target sample population, the mean value ranking positions affecting each of the existing PPP Model and ultimately as depicted in the Conceptual Alpha Model. This is despite Concession contracts ranked as the most suitable by respondents overall.
- (b) Arising from the interview survey and based on the experiences from PPP experts and subsequent verification of the aspects that arose from the questionnaire survey, it is evident that there is a synergistic effect amongst the dimensions of cost, time and quality that needs to be acknowledged. This would affect the existing PPP Models increased overall effectiveness in the event an imbalance is observed amongst the three dimensions in terms of performance. Similarly, the peripheral aspects could affect the existing PPP Models increased effectiveness if not addressed in the process of PPPs implementation.

Overall, and based on the Conceptual Beta Model, the existing PPP Models increased effectiveness takes into account both the dimensions of cost, time and quality and peripheral factors.

The development of the Conceptual Alpha Model and subsequent Conceptual Beta Model were therefore based on findings from extensive literature review, questionnaire survey from sector respondents and interview survey from PPP experts culminating into proposed use of all the existing PPP Models for possible operationalization in the Zambian Water and Sanitation Sector though at different levels of impact.

6.2 Limitations of the Research

This research is focused on whether existing Public - Private Partnership (PPP) Models can be used in the development of the Zambian Water and Sanitation Sector. The research therefore endeavours to test whether existing PPP Model could increase effectiveness of dimensions of cost, time and quality. Currently, PPPs in Zambia are in sectors such as transport, construction, agriculture, mining, energy and none in the water and sanitation sector though some form of commercialisation exists. While PPP Models are similar regardless of the sector in which they are implemented and that commercialisation can be termed as another form of PPP as it is in Zambia, there is likelihood that the non-existence of a formal PPP in the water and sanitation sector in Zambia may limit the knowledge and expertise levels expected from respondents. Lack of sufficient appreciation of PPPs in the water and sanitation sector by some respondents, off course bearing in mind that PPPs are similar in nature, can act as a limitation.

Other research limitations are identified as follows:

- Performance measurement on PPPs especially that based on quantitative analysis is generally limited due to lack of consistent data associated to PPPs thereby making it difficult to carry out significant benchmarking. Qualitative analysis could also poses a challenge considering that services are normally intangible in nature and their verifiability may posse another challenge. An independent investigation of effectiveness of PPP Models in the Water and Sanitation Sector across countries, regions or continental wise is difficult due to resource limitations thus reliance is

placed more on secondary data. This may call for a more thorough and robust investigation of the models to be undertaken.

- Only 4 existing PPP Models were used to rank for the most suitable PPP Model on the scale of 1 – 5. The non-inclusion of any other PPP Model acted as a limitation in term of ranking. If the fifth Model was included, possibly a different set of results could have been observed.
- Increasing or reducing the number of attributes for each independent factor used may lead to different sets of results altogether in terms of existing PPP Models increased effectiveness. The statistics are likely to change. This is likely to affect the decisions in this research marginally.
- While a Conceptual Beta Model has been proposed, its adoption to allow a PPP in the water and sanitation sector is not a guarantee. Politics, cultural issues and many other impediments may be at play especially if a proposal is made to employ a PPP in the Rural Water and Sanitation Sector where the issue of tariffs and cultural perceptions may be a hindrance and poverty levels are very high as compared to urban areas.

6.3 Conclusions

Based on the summary of result above, the research concludes that existing Public – Private Partnerships Models could increase effectiveness of dimensions of cost, time and quality at different levels of impact and that they could be used in the case of development of the Zambian Water and Sanitation Sector.

A Conceptual Alpha Model was first developed based on respondents’ views and opinions on increased cost, time and quality effectiveness using their respective attributes. This was followed by a Conceptual Beta Model that has been proposed for possible operationalization in the sector in question.

It is also indicative from the research that the overall effectiveness of existing PPP Models could be affected differently depending on how the dimensions of cost, time and quality impact on them and/or relate to each other. For instance, less of time effectiveness may affect both quality and cost effectiveness. Similarly, less of quality effectiveness may equally affect time and cost effectiveness, so is less of cost effectiveness. Effectively the

respective existing PPP Model scope may swell up making it difficult to accomplish its implementation. The overall effectiveness is likely to be impacted by the peripheral factors thus inhibiting the PPP Models successful implementation if not taken into account. There is need therefore to ensure a balance amongst the factors involved in order to get the maximum output from the models.

Additionally, the willingness of both the private and public sectors to participate in any PPP Model is an important prerequisite to increased effectiveness. The private sector can play a pivot role of providing finances needed for infrastructure development that is said to be insufficient whereas the public sector has the advantage of using the assets at its disposal as a contribution to the partnership. Government can also facilitate the acquisition of finances by the private sector by engaging various financial institutions so that they can extend loan facilities to the private sector. Similarly, there is need for community involvement either in terms of funds contributions or through public listing. These are likely to bring about value addition in the process of dispensing the various activities involved.

Government need to put in place various guidelines and policies, regulatory, legal and institutional frameworks to enable private sector participation in the delivery of public services. Though these are currently in place and considered sufficient, there is need for possible improvements and harmonisation. However, there is need for Government to exercise sufficient political will in a bid to encourage private sector participation in the provision of public services and to ensure that the needed operational environment is put in place. Similarly, the Government is well placed to deal with public perception and social and cultural issues that affect the manner in which a public private partnerships is likely to be implemented. Issues of profit motive, risk perception and value for money are also likely to affect the private sector if not handled properly. The need for sound management principles and technological skills cannot be over emphasised.

In conclusion, the existing PPP Models increased effectiveness depends largely on how the dimensions of cost, time and quality impact on them and the relationship that subsist amongst them. The research as shown that all the existing PPP Models could be used to increase effectiveness in the case of developing the Zambian Water and Sanitation Sector but also important to ensure that the peripheral aspects of funding of PPPs; public and private sector

willingness to participate; guidelines, policies, regulatory and legal frameworks; Government political will; public perception and related social and cultural issues on the private sector profit motive, risk perception, Value for Money, sound management principles and skills are addressed in the process of PPP implementation. This is in line with Government's Vision on PPPs *“to have well developed and maintained quality and socio-economic infrastructure and related services that enhances the Zambian people's livelihood and effectively contribute to national development through PPP frameworks and initiatives”*.

With the proposed Conceptual Beta Model, stakeholders are at liberty to operationalize it in a manner they see it fit and in a bid to improve on effectiveness in the manner water and sanitation services are delivered to the public and eventually contribute to achieving value for money. It is not therefore an overstatement to state that the increased effectiveness arising from the use of PPP Models as strategic tools in the Zambian Water and Sanitation Sector could sufficiently assist in the enhancement of the country's performance from the social, economic and political development point of view.

Paton (1985 cited in Sculli & Ho 1994, p. 56) suggests that the essence of managing is the ability to deal effectively with problems. And so problems themselves are social constructs, meaning that effective problem solving and management can only be conducted after the problem context embodying the individual problems has been well understood. Based on research tools, a Conceptual Beta Model has been developed to assist in the use of existing PPP Model for increased effectiveness. However, it should be noted that there should be certain levels of willingness to move in the strategic direction proposed.

6.3.1 Intended Contribution

Considering that there is no formal PPPs implemented yet in the Zambian Water and Sanitation sector, this study provides a greater understanding of how existing PPP Models can be used to increase effectiveness through dimensions of cost, time and quality thereby providing tangible benefits in as far as the provision of water and sanitation services in Zambia is concerned. The study will also act as a basis for future research on PPPs in the Zambian Water and Sanitation Sector.

6.4 Recommendations for Future Research

This research focused more on how existing PPP Models can be used to increase effectiveness in the Zambian Water and Sanitation Sector using dimensions of cost, time and quality. There are many more factors that could be used to enhance existing PPP Models performance such as efficiency, economy and productivity. While these terms have been mentioned in this study, study focused more on increased effectiveness as one of the three factors used in value for money. Therefore, the following issues are recommended for further research:

- Future research should take into account other factors such as efficiency, economy and productivity that are likely to relate well with effectiveness. In this way, a comprehensive understanding of PPP performance in terms of increased effectiveness would be arrived at, e.g. *an investigation on the use of existing PPP Models in the development of the Zambian Water and Sanitation Sector using factors of effectiveness, efficiency, economy and productivity*. This would be quite a mouthful study considering that each of the factor has sub-factor that will need to be taken on board but not insurmountable.
- The research took a wholesome approach of investigating into the use of existing PPP Models in the Zambian Water and Sanitation Sector. There is need to segregate the sector into Urban and Peri-Urban Water Supply and Sanitation (UPWSS) and Rural Water Supply and Sanitation (RWSS). For instance, an investigation into the use of existing PPP Models in the Zambian Urban/Peri-Urban or the Rural Water Supply and Sanitation. The research into these two segregated areas could yield different results based on factors such as levels of disposable income and ability to pay; social and cultural set ups and beliefs; perceived Government role in the provision and delivery of public services, etc.
- The need to harmonise some policies and pieces of legislation (policy, institutional and legal frameworks). Currently, there are various pieces of policy, institutional and legal framework that may pose a challenge especially if a PPP has to be initiated and

implemented in the water sector. For instance, the Water Policy of 2010; the Water Resources Management Policy of 2011; The NWASCO Act of 2007; the PPP Policy and Act of 2009 and other pieces of legislation may provide conflicting information for the purposes of PPP introduction and implementation may render the introduction and implementation of PPPs in the water and sanitation sector challenging. Harmonising such policies, institutional and legal frameworks would enable an effective and efficient PPP implementation.

- Public Private Partnerships as a financing strategy. This research is based on using existing PPP Models as a strategy for increased effectiveness and value addition as opposed to using it as a financing strategy. The research focus is on using PPP Models to increase effectiveness and not to be contrasted with other forms of financing. This would entail looking at various forms of financing and contrast them with PPP financing. For instance, PPP as an alternative funding strategy.
- The need to involve the community in the WSS reform. For instance, community involvement in the provision of water and sanitation: A case for PPPs. In this way, resistance from the public in terms of buying in the PPP strategy would be highly supported and increase the chances of PPP success. Cultural issues could be resolved as well including that of public WSS service providers.

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Appendix 1: Glossary of Terms

Terms	Definition
Public-Private Partnership (PPP)	<p>In the Zambian perspective, a PPP is defined as an arrangement between public and private sectors with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that would otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act, 2009).</p>
	<p>In the UK, PPP covers (HM 2000, IPPR, 2001 cited in Ghobadian et al., 2004)</p> <ul style="list-style-type: none"> • Long-term service contracts with the private sector organizations for the provision of a service or group or services; • The introduction of private sector ownership into state owned businesses, using the full range of possible structures including floatation, strategic partnerships, sale of either a majority or minority stakes; • Strategic partnerships with a wider range of stakeholders including business for formulate and assist in delivery of public policy or bid for funds; • Wider markets to utilise partnership arrangements to exploit public sector assets/know-how commercially for mutual benefits; and • PFI where private sector partner takes on the responsibility for providing a public service including design, build/enhance, finance, and maintain, the necessary infra-structure.
	<p>National Council for Public Private Partnership of the USA's definition of PPP as: "a 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."(Norment, 2000 cited in Li 2003).</p>
	<p>"A cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards " (CCPPP, 2001 pp. v cited in Ahadzi 2004)</p>
	<p>In South Africa, PPP is defined as “a contract between a public sector institution and a private party, in which the private party assumes substantial, technical and operational risks in the design, financing, building and operation of a project” (South African National Treasury – PPP Manual 2004, Module 1: pp. 4-5 cited in Faralam 2005).</p>

Glossary of Terms Cont...

Term	Definition
Public-Private Partnership (PPP)	Canadian Council for PPP - A cooperative venture between the public and private sectors, built on the expertise of each partner that best meets clear defined public needs through the appropriate allocation of resources, risks and rewards (ACCA, 2012).
	Wikipedia - Involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project.
	Arrangements where the public and private sectors both bring their complementary skills to a project, with varying levels of involvement and responsibility, for the purpose of providing public services or projects (Efficiency Unit, 2006).
	A PFI is a long term agreement between the public sector client and the private sector to provide a facility such as schools, hospital or an IT system, maintains it and provides essential facilities (Ball et al., 2000 cited in Ghobadian et al., 2004). Introduced by the UK government as an alternative means of raising funds for public projects through a BOO models (Nisar, 2007). Under PFI private companies design, build, own and operate facilities in return for a fee for the duration of a contract, which is typically as long as 25-35 years.
Public Finance Initiative (PFI)	Services sold to the public – the public sector purchases services from the private sector, which is responsible for up-front investment in capital assets. The public sector pays only on delivery of the service to the specified quality standards.
Public Finance Initiative scheme	Financially free – standing projects – the private sector designs, builds, finances and operates an asset, recovering costs directly through charges (tolls) to users rather than through public payments. The public sector involvement is limited to enable the project to go ahead through assistance with planning, licensing and other statutory procedures.
Joint Ventures	Joint ventures – costs are not met entirely through charges from end-users but are subsidised by public funds. The government role is limited to a contribution towards asset development. Operational control rests with the private sector.
Accessibility	Able to access water easily, enjoy or get some benefit as a result
Reliability	To rely on the availability of water.
Financial viability	Be able to sustain the operational cost of providing the commodity on a cost benefit basis
Performance – based service contracts	Focus on commercial and financial management contracts built around performance targets and links the remuneration of the service provider partly to meeting these targets

Glossary of Terms Cont...

Term	Definition
Management contracts	Entail only a limited transfer of responsibilities and risks to the private operator. Customers' stills hold a subscription contract; the public authority pays the operator a management fee and staff of the public authority remains employed by the latter. Usually a short period.
Affermages (lease contracts)	Private operator given responsibility by a public granting authority (government or asset-holding company) to operate and maintain assets and provide services to customers, including billing and collection. Involves longer periods of say 10 -15 years.
Concession contracts	Transfer all the technical, operational, commercial and financing risks and responsibilities to the private operator.
Value For Money (VFM)	<p>VFM is about measuring the effectiveness (doing the right things to achieve the objectives), efficiency (doing things well and right and getting maximum output for the minimum input) and economy (doing things cheaply and getting the correct quantity/quality of inputs) in PPP projects.</p> <p>Affordability, strategies for risk transfer and expertise needed for executing PPPs projects.</p>
Cost and cost effectiveness	<p>The cost of material, labour and overheads associated with the provision of a service.</p> <p>From the water and sanitation perspective, cost effectiveness is achieved by doing the following among others:</p> <ul style="list-style-type: none"> • Reduced compensation for unjustified disconnections by the provider • Reduced unaccounted for water • Reduced repairs and maintenance cost • Reduced unit product cost • Reduced unit customer cost • Reduced distribution of bills cost • Increased employee capabilities
Quality and quality effectiveness	<p>Quality is meeting the customer requirements, i.e. needs and expectations. Reliability, continuous improvement, consistence, conformance etc. (Oakland, (2003).</p> <p>From the water and sanitation perspective, quality effectiveness is achieved by doing the following among others:</p> <ul style="list-style-type: none"> • Quality of drinking water in terms of appearance and smell • Sufficient pressure in order to meet the customer demands • Few households flooded with sewer

Glossary of Terms Cont....

Term	Definition
Time and time effectiveness	<p>The total time to deliver a programme or project or activity based on the agreed scope and quality constraint.</p> <p>From the water and sanitation perspective, time effectiveness is achieved by doing the following among others:</p> <ul style="list-style-type: none"> • Hours of continuous water supply at connections • Period of the bill and time for payment • Response time to customer complaints, request for meters, new connections, and access to offices of the provider. • Notification for interruption of water supply and measures to correct the situation • Quick amelioration of sewer blockage • Increased information system capabilities
Concessions.	Long-term in nature and transfers most of the technical, operational, commercial and financial risks and responsibilities to the private operator.
Affermages (lease contracts)	Medium – term in nature and tends to combine private operation of the service with public financing for developing the infrastructure and involve a sharing of the commercial risk between the public and private partners.
Management contracts	Short – term in nature often used as a first step towards longer-term PPPs. Entails a limited transfer of responsibilities and risks to the private operator. Public authority remains in charge of financing and implementing investment in rehabilitation and system expansion but pays the operator a management fee that includes both fixed and variable part.
Service contracts	They are normally performance base where a private company obtains a fixed payment for its service. Expected output and products are clearly defined.
Efficiency	Measures how productivity inputs (money, time, equipment, personnel etc.) were used in the creation of outputs (products, outcomes, results). Also concerned with the percentage resources actually used over the resources that were planned to be used. An efficient PPP model is one that achieves its objectives with the most resourceful expenditures of resources.
Effectiveness	Measures the degree to which results/objectives have been achieved. Also defined as the percentage actual output over the expected output. An effective PPP model is one that achieves its results and objectives.

Appendix 2a: Piloted Questionnaire survey for comments

Aim of the questionnaire survey.

This research instrument aims at gathering data from respondents (stakeholders) to assist investigate as to whether the existing Public – Private Partnerships (PPPs) Models/schemes/arrangements can increase cost, time and quality effectiveness in the Zambian Water and Sanitation Sector. For this purpose PPP is defined as

“An arrangement between public and private sectors with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that would otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act, 2009)”.

Aim of the research.

The aim of the research is to develop a PPP process model that will conceptualise the PPP effectiveness in the development of the Zambian water and sanitation sector.

Anonymity and confidentiality

The data and information to be gathered will not reflect the views and/or opinions of individual respondents but will be presented in an aggregated manner. No disclosure of individuals views will be made unless or otherwise expressly stated by the respondent or permission sought.

Let me thank you in advance for your time and interest to participate in this survey.

Part 1: General Information

Required to tick; rate; rank or indicate Yes/NO

1. The sector to which the respondent belongs
2. Company/organization/institution represented
3. Designation
4. No. Of years/months in company/organization
5. Knowledge of PPPs (ignore 6 and 7 if none)
6. In which sector PPPs implemented or being implemented?
7. What type of PPPs models?

Respondents required to tick the appropriate scale from 1 – 5 according to the level of significance rating them as insignificance, slightly significant, significant, very significant, and extremely significant respectively. This is based on respondents’ general knowledge and experience on PPP models

Q1: To what extent could existing PPPs models increase cost effectiveness using the following cost attributes?

- Solve the problem of public sector budget restraint
- Enhanced government’s capacity to fund other services
- Reduce public money tied up in capital investment
- Cap the final service cost
- Facilitate creative and innovative approaches
- Reduce project total cost
- Save time in delivering the project
- Transfer risk to the private partner
- Reduce public sector administrative cost
- Improved maintainability
- Technological transfer to public sector
- Accelerated project development
- Higher project value earned
- Low project life cycle cost
- Financial viability
- Increased affordability
- Financial sustainability
- Operational efficiency
- Others (please specify)

Q2: To what extent could existing PPP models increase time effectiveness using the following time attributes?

- Accessibility
- Improved activity definition
- Improved activity sequencing
- Improved activity resource estimating
- Improved activity duration estimating
- Improved schedule development
- Improved schedule control

Others (please specify)

Q3: To what extent could existing PPP models increase quality effectiveness using the following quality attributes?

- Access to safe – piped water
- Increased service quality
- Reliability of service
- Increased project functionality
- Quality systems output
- Quality performance

Others (please specify)

Appendix 2b: Sample Questionnaire survey Instrument

Aim of the questionnaire survey.

This research instrument aims at gathering data from respondents (stakeholders) to assist investigate as to whether the existing Public – Private Partnerships (PPPs) Models/schemes/arrangements can increase cost, time and quality effectiveness in the Zambian Water and Sanitation Sector. For this purpose PPP is defined as

“An arrangement between public and private sectors with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that would otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act, 2009)”.

Aim of the research.

The aim of the research is to develop a PPP process model that will conceptualise the PPP effectiveness in the development of the Zambian water and sanitation sector.

Anonymity and confidentiality

The data and information to be gathered will not reflect the views and/or opinions of individual respondents but will be presented in an aggregated manner. No disclosure of individuals views will be made unless or otherwise expressly stated by the respondent or permission sought.

Let me thank you in advance for your time and interest to participate in this survey.

Part A: General Information

A1: Please indicate the company/organization/institution or sector to which you belong?

TICK √ as appropriate in right column.

Public – Private Partnership (PPP) Unit	
Ministry of Local Government and Housing	
Ministry of Finance & National Planning	
Ministry of Energy and Water Development	
National Water and Sanitation Council	
Private Sector	
NGO	
Commercial utility (CU)	
City, Municipal or District Council	
Donor community	
Others: State	

A2: Please indicate the category of management in which you fall?

TICK √ as appropriate in right column.

Top Management	
Middle management	
Operational management	
Other levels: State	

A3: Please indicate the number of years served in your company/organisation/institution or sector?

TICK ✓ as appropriate in right column.

Between 0 – 5	
Between 5 – 10	
Between 10 – 15	
Between 15 – 20	
More than 20	

PART B: Public-Private Partnerships (PPPs) information

B1: Kindly **TICK** ✓ the number that indicates your level of knowledge of Public – Private Partnerships (PPPs).

Very little

1	2	3	4	5	6	7	8	9	10

Sufficient

B2: Please indicate by **TICKING** ✓ against the **SECTORS** in which PPPs have been implemented or being implemented in Zambia or elsewhere?

Sector	YES	NO
Power generation (Energy) sector		
Water and Sanitation sector		
Waste management sector		
Construction sector		
Transport sector		
Health sector		
Other Sectors, state.....		

B3: What type of PPPs model/scheme/arrangement/contract would be best suited in the Zambian Water and Sanitation sector?

Please **RANK** the PPPs in order of their suitability (i.e. **1** for the “**Least Suitable PPP**” and **5** for the “**Most Suitable PPP**”)

Concessions contract (20 -30 years), i.e. - (Build- Operate - Own & Transfer (BOOT) or Build - Operate & Transfer (BOT) or Build – Transfer and Operate (BTO)	
Affermages/Lease contract (5 – 10 years)	
Management contract (3 – 5 years)	
Service contract (1 -2 years)	
Other: State.....	

Part C: Factors or measures of PPPs model effectiveness

C1: To what extent do the “**Most Suitable**” ranked existing PPP model in B3 above **increase cost effectiveness** using the following **cost attributes**? Rate according to the appropriate level of significance for **each of the attributes** based on scales 1 – 5 as indicated below:

- Insignificance 1
- Slightly significant 2
- Significant 3
- Very significant 4
- Extremely significant 5

- Maintain standard tariff levels
- Solve the problem of public sector budget restraint
- Enhanced government's capacity to fund other services
- Reduce public money tied up in capital investment
- Increased accessibility to water & sanitation
- Facilitate creative and innovative approaches
- Reduce project total cost
- Save time in delivering the project
- Transfer risk to the private partner
- Reduce public sector administrative cost
- Improved maintainability of infrastructure
- Technological transfer to public sector
- Accelerated project development
- Higher project value earned
- Low project life cycle cost

- Improved financial viability
- Increased affordability
- Financial sustainability
- Operational efficiency
- Production efficiency
- Others (please specify)

C2: To what extent could the “**Most Suitable**” ranked existing PPP model in B3 above **increase time effectiveness** using the following **time attributes**? **Rate as per level of significance indicated in C1.**

- Increased accessibility in terms of hours of continuous water Supply.
- Improved activity definition
- Improved activity sequencing
- Improved activity resource estimating
- Improved activity duration estimating
- Improved project schedule development
- Improved project schedule control

- Quick amelioration of sewer blockage
- Response time to customer complaints, requests for meters and new connections
- Improved billing efficiency
- Others (please specify)
-

C3: To what extent could the “**Most Suitable**” ranked existing PPP model in B3 above **increase quality effectiveness** using the following **quality attributes? Rate as per level of significance indicated in C1.**

- Access to safe – piped drinking water
- Access to improved sanitation services
- Increased customer service quality
- Reliability of service provision
- Increased project functionality
- Quality systems output
- Quality performance or reduce error rate
- Increased training of staff
- Sufficient pressure in order to meet the customer demand
- Increased office and front line service

Others (please specify)

Part D: Further comments:

Kindly provide comments and/or suggestions you wish to make **(if any)** on how existing PPP model could increase effectiveness in the *Zambian* water and sanitation sector.

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Appendix 3a: Piloted Interview Survey for comments:

1. General information to be obtained on
 - a. The sector to which the respondent belongs
 - b. Company/organization/institution represented
 - c. Designation
 - d. No. Of years/months in company/organization
2. Do you know the sources of funding for the Water and Sanitation sector development?
3. Do you have any knowledge of PPPs (ignore 4 and 5 if none)
4. In which sector have PPPs implemented or being implemented?
5. What type of PPPs models you are aware of? In Zambia or elsewhere?
6. What PPP models would you opt for if any?
7. What would you consider to be the main benefits of introducing PPP models in the water and sanitation sector? To both Public and private sectors?
8. Is there anything government could do to attract private sector participation?
9. Are you aware of any guidelines, policies or legislation to enable PPPs to be introduced? All sectors?
10. Are they sufficient?
11. What are the merits or demerits of introducing PPPs models in the water and sanitation sector?
12. Taking the merits from (7) above, how do you think the adoption of existing PPP models could increase the following:
 - a. Cost effectiveness?
 - b. Time effectiveness?
 - c. Quality effectiveness?
13. What are the major obstacles of attracting private sector, local and foreign skills and capital into partnering with public sector?
14. How can the obstacles in (13) above if any be overcome?

Appendix 3b: Final Interviews Survey

Aim of the interview.

This research instrument aims at gathering data from respondents (stakeholders) as a follow up to the questionnaire survey conducted to investigate as to whether the existing Public – Private Partnerships (PPPs) Models/schemes/arrangements can increase cost, time and quality effectiveness in the Zambian Water and Sanitation Sector. For this purpose PPP is defined as

“An arrangement between public and private sector with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that would otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act, 2009)”.

Aim of the research.

The aim of the research is to develop a PPP process model that will conceptualise the PPP effectiveness in the development of the Zambian water and sanitation sector. The semi-structured interview will therefore assist in the validation of the data and information that arose from the questionnaire survey.

Anonymity and confidentiality

The data and information to be gathered will not reflect the views and/or opinions of individual respondents but will be presented in an aggregated manner. No disclosure of individuals views will be made unless or otherwise expressly stated by the respondent or permission sought.

Let me thank you in advance for your time and interest to participate in this interview.

Interview areas of interest

1. What is your level of knowledge of PPPs

Probe:

- Appreciation and understanding of PPPs.
- Types of PPP Models are you aware of in Zambia or elsewhere?

2. What are the sectors in which PPPs have been implemented or being implemented, in Zambia or elsewhere?

Probe: Have they been successful and if not give reasons?

3. What would you consider to be the main benefits of introducing existing PPP Models in the water and sanitation sector as they relate to:
Probe:
- The Public sectors?
 - The Private sector?
 - Any demerits of introducing PPPs in the sector?
 - How would you address the demerits?
 - What PPP Models would you opt for if any?
 - What are the reasons for your choice?
4. Taking the benefits from (5) above, how do you think the adoption of either of the existing PPP Models could increase the following:
Probe:
- Cost effectiveness?
 - Time effectiveness?
 - Quality effectiveness?
 - Any relationship amongst cost, time and cost effectiveness?
5. What would you consider to be the sources of funding for the Water and Sanitation sector development in Zambia?
Probe:
- Are they sufficient and if not give reasons?
 - Any other sources you feel would be ideal?
6. Is there anything government could do to attract private sector participation?
Probe:
- What are the major obstacles of attracting the private sector?
 - How can the obstacles be overcome?
7. Are you aware of any guidelines, policies, legal and institutional frameworks relating to PPPs and to support the introduction of PPPs?
Probe:
- Are they sufficient?
 - If not, what is it that could be done?
 - Any other guidelines or frameworks available?