

**PUBLIC SECTOR INFRASTRUCTURE DELIVERY THROUGH  
PUBLIC PRIVATE PARTNERSHIPS IN ZAMBIA**

By

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A dissertation submitted to the University of Zambia in fulfilment of the requirements for the  
Degree of Master of Engineering in Construction Management

THE UNIVERSITY OF ZAMBIA

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## **Abstract**

Zambia, like many other countries, has embraced Public Private Partnerships (PPPs) as a project delivery method. The country faces budgetary constraints which have made maintenance and provision of new infrastructure a challenge. PPPs seem to create opportunities which can stimulate investment in infrastructure development and economic growth.

The aim of the study reported was to highlight benefits, constraints and risks inherent in the implementation of PPP construction projects in Zambia.

Using literature review, structured interviews, questionnaire surveys and case studies to collect data, the study identified benefits and confirmed the prevalence of constraints and risks in the implementation of PPP construction projects in Zambia. The major benefits, constraints and risks were identified and ranked. There was agreement among respondents regarding the ranking of benefits, constraints and risks regarding construction projects in Zambia. Appropriate improvements to the regulatory framework were recommended for the PPP procurement approach to be successfully utilised and implemented in Zambia. The study also identified a staffing gap in management of PPP construction projects at national and municipal levels.

It was established that the PPP Model that was developed during the study could be used to improve project planning, implementation and monitoring, thereby, enhancing delivery. Appropriate project management legislature, technical practices and training for successful execution of construction projects have been recommended, especially in developing economies like Zambia.

**Keywords:** Public Private Partnerships, Benefits, Constraints, Risks, Zambia

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## **List of acronyms and abbreviations**

BOO	Build Own Operate
BOT	Build Own Transfer
COMESA	Common Market for Eastern and Southern Africa
CSO	Central Statistics Office
CSPR	Civil Society for poverty Reduction
DAC	Development Assistance Committee
DBFO	Design Build Finance Operate
FNDP	Fifth National Development Plan
GDP	Gross Domestic Product
IPC	Interim Payment Certificate
LCC	Lusaka City Council
MoFNP	Ministry of Finance and National Planning
NCC	National Council for Construction
NCPPP	National Council for Public Private Partnerships
OECD	Organisation for Economic Co-operation and Development
PPPU	Public Private Partnership Unit
PPP	Public Private Partnership
RDA	Road Development Agency
SPV	Special Purpose Vehicle
SADC	Southern African Development Corporation
SSA	Sub-Sahara Africa
USITC	United States International Trade Commission

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background**

The Government of the Republic of Zambia faces challenges in the delivery of public infrastructure including maintenance and operational obligations. There is an on-going need for provision of new and the upgrading or rehabilitation of existing systems in order to deliver public services more effectively and extend access to services to citizens. It is important to note that the increase in population has not been matched by increased capacity in infrastructure by Government (Ministry of Works and Supply, 2006).

In recent years, Governments the world over have struggled to limit the costs of infrastructure development without reducing services (GAO, 1999). Budgetary constraints in several countries have led to the seeking of alternative methods of financing infrastructure provision (Chege and Rwelamila, 2001). At the US federal level, various initiatives have been targeted at rethinking the role of the government in managing its buildings and properties, initiatives that in many cases mirror efforts at the state and local level as well as efforts in other countries. To meet these fiscal demands, federal agencies are increasingly interested in managing buildings in a more business-like manner, including exploring the formation of partnerships between the federal government and the private sector (GAO, 1999).

According to Muleya and Zulu (2009), Public Private Partnerships (PPPs) have received widespread attention in several countries and it was inevitable that there would be an increase in the use of this approach. These PPP initiatives have enabled the public sector to utilize the private sector finance and expertise for the provision of public infrastructure through various schemes such as Design Build Finance and Operate (DBFO), Build Own Operate (BOO), Build Operate and Transfer (BOT) and many others options.

One of the aims of examining different procurement options is to enable the client to obtain value for money and it is suggested that selection of an appropriate procurement system for a



project would assist clients to attain financing, timely delivery and quality objectives of the project.

According to Ahmed et al (2002), delays on construction projects are a universal phenomenon. They are usually accompanied by cost and time overruns. These have a debilitating effect on parties (owners, contractors, and consultants) to a contract in terms of growth in adversarial relationships, mistrust, litigation, arbitration, cash-flow problems, and a general feeling of trepidation towards each other.

## 1.2 Research justification

The Construction industry is a barometer of economic growth. Zambia's construction industry is on the downward slide because of a myriad of constraints including the lack of housing policy which ended in the 90s. The fact that the country's construction industry has for some time been sliding into oblivion is no secret. This has certainly been a worrisome trend (Anon, 2001).

The table below indicates how Zambia's infrastructure and its concomitant construction industry have recorded the highest growth rates in the Zambian economy, whilst reducing in the growth rate every year since 2000.

**Table 2.1:** *Construction Industry Statistics (2000 – 2007)*

Construction Industry	2000	2001	2002	2003	2004	2005	2006	2007
GDP at constant 1994 prices (Unit K' Billion)	123.6	137.8	161.8	196.8	237.1	287.3	328.7	369.6
GDP Annual Growth	11.5	17.4	21.6	20.5	20.5	21.2	14.4	12.4
Industrial Share %	4.9	-	-	-	-	9.1	9.8	10.4

*(After: Bank of Zambia annual reports, 2009)*

Figure 1.1 shows the growth trends for the contributors to GDP in the years ranging from 1994 to 2007.

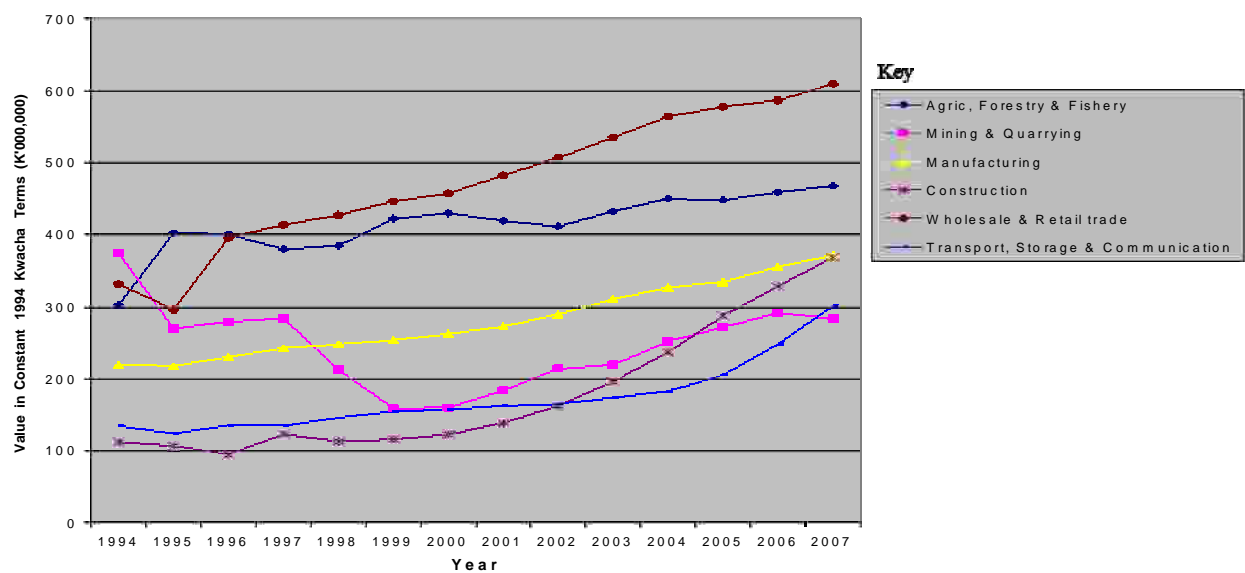
Despite this being the scenario, the growth rate of the construction industry has been minimal as can be seen in Figure 1.1. This is an indication that there are factors that are hindering the further increase in the growth rate of the industry. Further investigations into the trends in some sectors of the construction industry indicate that there has been a consistent pattern of projects costing more than planned, taking longer than planned or even being terminated before commencement or during implementation as indicated in Table 1.2.

Table 1.2 shows the trend in selected road construction projects throughout the country. The result of these major Government expenditure projects was poor delivery. The trend suggests a lot as to the extent of the problem in the construction industry in general. This situation triggers a necessity for a comprehensive study of construction projects in order to find alternative ways of enhancing efficiency, productivity and increasing value for money while alleviating qualitative and quantitative shortfalls and financial risks. This is because the resultant non-performance of projects in terms of cost, time and quality has far reaching effects on the economy which, if left unchecked would retard national development.

Mashamba (2009) cites lack of skills at all levels (technical/managerial/business), poor contract management skills, inadequate marketing skills, weak organizational capacity, training in appropriate regional technologies, access to training and lack of training facilities as some of the causes to the weakness of the local construction industry. He further states that Zambia is at the bottom of growth and to achieve development it will require the country to reinvest in itself first. Zambian construction industry only contributes about 9% to the GDP. The country is lacking in key infrastructural development such as roads, energy, housing and education.

Large scale projects do not succeed due to technically poor specifications. The contractor follows the quality that has been specified and in most cases, is cheap due to inadequate funding. The result is a cheap product and laymen, will blame the contractor. The contractor will build based on what he has been asked to do and not what one would like to see. Lack of adequate funding and corruption is the reason why most Zambian roads do not last (Anon,

2009). He further noted that the challenge concerns reports of contractors disappearing after receiving their dues before completing their work.



**Figure 1.1** Growth Trends for contributors to GDP

(After CSO, 2008)

This mainly affects government-funded projects but noting that the state is the major client in the sector, this trend means delays in paying contractors until after works are completed. The overall effect is a cycle.

**Table 1.2** *Performance of selected road construction projects*

	Name of road project	Start Date	Original Finish Date	Revised Finish Date	Original Contract Sum (US\$' Million)	Final Contract Sum (US\$' Million)	Remarks
1	Nyimba-Katete	Oct 2003	Oct 2004	Jul 2005	4.90	5.88	Beyond budget, beyond schedule
2	Kasama-Luwingu	Oct 2001	Nov 2003	Nil	35.00		Beyond schedule
3	Kashikishi-Lunchinda	Jun 2001	Jan 2003	Nil	37.50		Incomplete work
4	Mpika-Kasama	Jun 2001	Dec 2002	Nil	2.38		Beyond schedule
5	Mpika-Muwele	Jun 2001	Dec 2001	Nil	1.30		Failure to commence
6	Chambeshi-Chinkobo	Jan 2001	Aug 2001	Nil	1.35		Failure to commence
7	Isoka-Muyombe	Dec 2000	Mar 2002	Aug 2002	4.00	5.50	Beyond budget, beyond schedule
8	Mpika-Chinsali	May 1999	Mar 2000	Nov 2000	1.95	1.95	Beyond schedule
9	Chinsali-Nakonde	Apr 1999	Jul 2000	Nov 2000	2.00	2.00	Beyond schedule
10	Mutanda-Kasempa	Feb 1997	Feb 1999	Dec 2000	3.85	6.45	Beyond budget, beyond schedule

	Name of road project	Start Date	Original Finish Date	Revised Finish Date	Original Contract Sum (US\$' Million)	Final Contract Sum (US\$' Million)	Remarks
11	Luanshya-Mpongwe	Nov 1994	Jan 1997	Dec 2001	2.53	3.63	Beyond budget, beyond schedule
12	Choma-Namwala	Nov 1994	Feb 1998	Nil	2.50	8.60	Beyond budget, incomplete work

(After Roads Department, 2002; RDA, 2005)

Lives and livelihoods are suffering from the fragile state of infrastructure in Sub-Saharan Africa (SSA). The lack of transport, power, communication networks, water, sanitation and other infrastructure puts severe constraints on economic growth and poverty reduction across the region (www.hdrstats.undp.org; International Energy Agency, 2006).

Poor delivery in the construction industry has been of great concern also in the public media. In a bid to solve this problem, the government early in the year 2008 blacklisted 42 contractors for allegedly performing shoddy works (Anon, 2008). Some contracts were terminated and apparently some contractors claimed compensation citing wrongful termination of contracts. Should it be established that contractors are right, it would translate in government losing a lot of money on compensation and procurement of new contractors for the works. The civil society has also argued that the Government would continue to put taxpayers' money in a 'bottomless pit' if there was no proper management of construction projects (CSPR, 2006).

Despite the prevailing failure to deliver public infrastructure and the numerous public complaints on the extent to which public sector infrastructure delivery has affected the industry, not much has been done to systematically address the problem. Implementing agencies and contractors do not seem to have established methodologies for addressing the causes and effects of poor delivery on public sector infrastructure projects. Improved management of construction projects would only be demonstrated when projects of desired quality are delivered within their scheduled period and costs. The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depend on a methodology that requires sound engineering judgment (Hancher *et al*, 1981).

### **1.3 Problem Statement**

The government faces challenges in the delivery of public infrastructure including the maintenance and operational obligations. In most projects, there is poor performance, over expenditure and poor delivery (Ministry of Works and Supply, 2006). By allowing PPP, the delivery of public service infrastructure may be enhanced by accessing the private sector's financial, managerial, professional and technical expertise. The necessary maintenance and operation of this infrastructure may also be enhanced by these private sector resources. This would allow the public services to be delivered efficiently and effectively thereby allowing government to channel limited resources to areas where direct public investment and intervention is required such as health and education (Ministry of Works and Supply, 2006).

### **1.4 Research questions**

The researched investigated the following questions:

- a) What are the causes of poor delivery of public sector infrastructure projects?
- b) How can the performance of projects be improved with using Public Private Partnerships?
- c) What are the benefits, opportunities and challenges of using PPPs?
- d) How can the procurement of public sector infrastructure be improved?

### **1.5 Project Main Aim and Objectives**

#### **1.5.1 Main Aim**

The main aim of this research was to develop a best practice operational and monitoring model to be used in public infrastructure that would help lower cost escalation, schedule overruns and quality shortfalls. It deals with project procurement, financing, delivery, monitoring and control of public infrastructure using Public Private Partnerships (PPPs).

#### **1.5.2 Specific Objectives**

To attain the main objectives, specific objectives in this study were to:

- a) Establish the factors which lead to poor delivery of public sector infrastructure projects;
- b) Analyse how the identified factors can be dealt with using Public Private Partnerships in relating to public sector infrastructure delivery;
- c) Evaluate the possible benefits, opportunities and challenges of using Public Private Partnerships in public sector infrastructure projects;
- d) Develop a technical operational and monitoring framework model to be used in the procurement of public sector infrastructure using PPPs in Zambia.

## **1.6 Organisation of the dissertation**

The report is organized in eight chapters.

*Chapter 1* outlines the background, rationale, aim and objectives of the study. It also presents the achievements recorded in the study.

*Chapter 2* lays a foundation of the study through the review of literature relevant to Public Private Partnerships globally.

*Chapter 3*, outlines the genesis of Public Private Partnerships in Zambia through the review of literature from local publications.

*Chapter 4* highlights of the various research methodologies and the justification for the method adopted for the study is presented.

*Chapter 5* presents the results of the research survey. The analysis of the results is also presented and discussed. The chapter further recommends the necessary steps that could be adopted in model development.

Chapter 6 reviews various case studies on the subject. The case studies are from construction projects that adopted PPP as a procurement route.

The PPP Model is presented in *Chapter 7*. The development steps and its use in project planning, implementation and monitoring is also presented.

The dissertation ends with *Chapter 8* which presents the conclusions, limitations and recommendations of the study.

This chapter outlined the background and rationale of the research, defining its aim and objectives. It also presents the justification to the study and the questions that were being investigated. The next chapter discusses the literature reviewed at global level.

## **CHAPTER 2: LITERATURE REVIEW FROM A GLOBAL PERSPECTIVE**

### **2.1 Introduction**

Construction projects in developing countries continue to under-perform in all objectives of functionality, cost, time and quality. According to Masambaji and Ssegawa (2008), the cause of this phenomenon had been a subject of numerous studies for over decades. The need to reduce the risk of poor performance of projects was very crucial in developing countries because most of the socio-economic programmes have an element of a construction project. While many reasons have been forwarded for the poor performance of construction projects, lack of effective control remained high on the list. This is firstly, because project control was not a self-contained activity but rather an integrated activity that received outputs from earlier phases of the project life-cycle processes. Without a good quality plan, project control could not be achieved. Secondly, it required efficient, effective and vigilant processes and actions to ensure its successful accomplishment (Ibid, 2008).

Claro (2008) observed that reform of the state was one of the most important components of the International fight against corruption. Recently, modernization of procurement systems had been an integral part of the reform of the State efforts in most countries. Such a modernization was difficult and came with many challenges in the road ahead. New evaluation tools to assess capacity to tackle these challenges were being developed by the international and regional organizations such as OECD/DAC, MDBs and others.



International studies indicated Public Sector Procurement accounts for approximately 15% to 20% of GNP in many countries. Procurement had traditionally been poorly managed with inefficiencies adding anywhere between 15% to 20% to the cost of the works, goods and services being procured. Corrupt practices added an additional 15% to 20% to the cost of those works, goods or services. In other words, inefficiency and corruption combined could account for 2.25% to 4% of GNP in most countries, thus negating growth. These mechanisms were at the core of the new trends and changes being introduced in Public Sector Procurement around the world: These mechanisms included; Framework Contracts, Lease Agreements, Reverse Auctions and Public-Private Partnerships.

Countries that had introduced them or planned to do so were facing challenges and opportunities on institutional and legal reform as well as capacity building (Claro, 2008).

## **2.2 What is a Public Private Partnership?**

Public Private Partnerships have been called by different acronyms in different countries: P3 in USA, 3P in Canada, PFI in Europe and as PPP in other countries; same process with many variations.

### ***2.2.1 Public Private Partnerships as a process***

William (2003) defined Public Private Partnerships as an arrangement of roles and relationships in which two or more public and private entities coordinate/combine complementary resources to achieve their separate objectives through joint pursuit of one or more common objectives. They are arrangements between government and private sector entities for the purpose of providing public infrastructure, community facilities and related services. Such partnerships are characterized by the sharing of investment, risk, responsibility and reward between the partners. The reasons for establishing such partnerships vary but generally involve the financing, design, construction, operation and maintenance of public infrastructure and services. The underlying logic for establishing partnerships is that both the public and the private sector have unique characteristics that provide them with advantages in specific aspects of service or project delivery. The most successful partnership arrangements

draw on the strengths of both the public and private sector to establish complementary relationships. The roles and responsibilities of the partners may vary from project to project. For example, in some projects, the private sector partner will have significant involvement in all aspects of service delivery, in others, only a minor role. While the roles and responsibilities of the private and public sector partners may differ on individual servicing initiatives, the overall role and responsibilities of government do not change. Public private partnership is one of a number of ways of delivering public infrastructure and related services. It is not a substitute for strong and effective governance and decision making by government. In all cases, government remains responsible and accountable for delivering services and projects in a manner that protects and furthers the public interest (Ministry of Municipal Affairs, BC).

William (2003) described the three basic dimensions or characteristics of Public Private Partnership as being shared goals, shared resources (time, money, expertise, people) and shared risks and benefits. He further stated that without all three characteristics, there is no reason to create or continue a partnership.

### ***2.2.2 Public-Private Partnerships compared to traditional procurement methods***

Raphael (2007) argues that traditionally, private sector participation in infrastructure procurement has been limited to separate planning, design or construction contracts on a fee for service basis. Under a PPP, the private sector has an extended role in return for assuming more risks. Similar to project finance structures, project risks are allocated to the party that is best equipped to manage them. While the public sector usually retains ownership of the facility, the private party will bear additional risks and/or be given additional decision rights in the completion of the project.

William (2003) further argues that the traditional contractual arrangement of a separate contractor and designer has many problems and does not allow for the application of PPPs. The competitively bid project is often characterized by adversarial relationships between the government owner, the designer, and the constructor. Responsibilities are fragmented and

shared, and the owner is placed in the position of being the arbiter of disputes. There is now an increasing demand for better quality and more innovative services and products than the traditional competitively bid project can often provide. There is now a continuum of public-private partnerships (PPPs) that can be used to improve upon the traditional competitive bid process (William, 2003).

In traditional competitive bidding, the constructor with the lowest bid is selected to perform the project. The constructor is then obligated to perform the construction for the low bid amount unless design changes require change orders for additional work. Figure 2.1 shows the contractual arrangements found using the traditional format. Recently, many government agencies have sought out new project delivery methods due to the many inherent drawbacks of the traditional construction process. Chief among the problems encountered with the traditional method is the potential to select a constructor that has made an unrealistically low bid. This may result in low-quality workmanship on the project because the constructor does not have the funds to properly complete the project. Additionally, the competitively bid project is often characterized by adversarial relationships between the government owner, the designer, and the constructor. Responsibilities are fragmented and shared, and the owner is placed in the position of being the arbiter of disputes. The traditional model also has the significant drawback that construction cannot commence until after the design is approved.

### ***2.2.3 Public and Private sector as a Public Private Partnership***

Norment (2006) describes the public sector as a legal authority that looks at the protection of the procurement policies. It has a broad perspective with a duty to balance the competing goals to meet the public needs. The public sector also has adequate personnel which is dedicated but constrained due to lack of knowledge. The sector has capital resources with underutilized assets. The duty of the public or government, is to pursue the reform process aggressively in order to achieve economic growth and create wealth for all people.

He further describes the private sector as having management efficiency, newer technologies, workplace efficiencies, cash flow management, and personnel development and shared resources (financial and other). In comparing the varying needs of the two, Norment (2006)

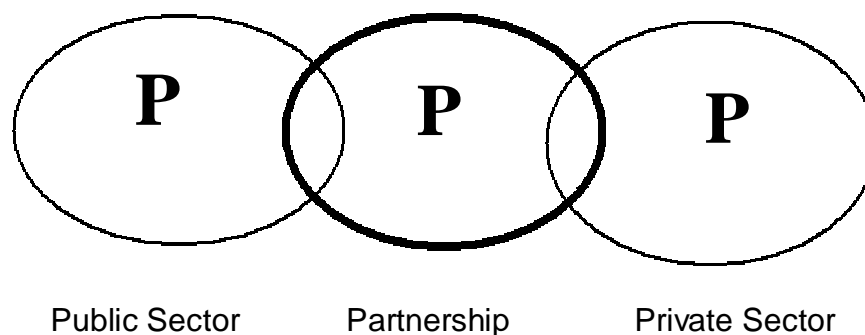
argues that the goal of the public sector is service requirement while that of the private sector is service delivery; and the two varying goals can only be met through a partnership. In the Table 2.1, Norment (2006) compares the varying goals of the two parties.

**Table 2.1** *Comparison between public and private sector interests*

<b>Business (Private Sector)</b>	<b>Government (Public Sector)</b>
Customer satisfaction	Responsibility
Return on investment	Accountability
Risk/Reward evaluation	Risk Avoidance

*(After Norment, 2006)*

Heathcote (2003) demonstrates the relationship between two parties through Figure 2.1.



**Figure 2.1:** *Partnerships in a PPP*

*(After Heathcote, 2003)*

Davis (2007) describes the public-private as a contractual agreement with a typical objective to increase funding and financing opportunities and better facilitate project and service delivery. He observes that the private sector expectations include: increased financial/investment opportunities and acceptable rate of return based on risk; while the

public sector expectations include: a combination of lowered cost, improved service quality, new technology, risk reduction, increased technical/managerial expertise/depth. The private sector will be interested in providing some services more than others, and taxation and financial considerations will be fundamental issues for the potential private partner. Generally, the private sector will be most interested in those services with unmet demand, revenue generating capability, revenue development potential, demonstrated project viability and demonstrated strong political commitment to the project by local government.

## **2.3 The rebirth of Public Private Partnerships in recent decades**

Globally, the rebirth of PPPs in recent decades can be traced back to a number of changing circumstances in the provision of public services and the market for infrastructure finance in most countries. Raphael (2007) summarizes the reasons for such a rebirth as follows:

### ***2.3.1 Changing attitudes to public services delivery***

One of them is greater efficiency in the use of public resources. Experience has shown that many public sector activities can be undertaken more cost effectively with the application of private sector management disciplines. It has been estimated that state and local governments experience cost savings of 10 to 40 percent through the use of PPP privatization schemes (NCPPP, 2002). There has been a marketization of the public sector in the sense that public sector activities have been downsized and can now be managed by the private sector. Darrin (2004) argues that “PPPs can be seen as one component of a rearrangement of the public sector with a management culture that focuses on the centrality of the citizen or customer, accountability for results, investigation of a wide variety of alternative service delivery mechanisms, and competition between public and private bodies for contracts to deliver services consistent with cost recovery and value for money.” In sum, the government is not the direct provider of services anymore but rather the enabler, coordinating and regulating the provision of public services by the private sector.

### ***2.3.2 The commercialization of public services***

A second factor contributing to the rebirth of Public-Private Partnerships is the recent commercialization of public services. When procuring highway projects, governments have two options for underwriting capital expenditures: they either use tax revenues or user fees. As a result, users and not taxpayers are now paying for infrastructure projects in the form of the tolls they pay when they use the infrastructure. PPPs are a means of increasing investment in infrastructure. Economic growth is highly dependent on the enhancement and development of infrastructure, particularly in utilities and transport systems. There is an urgent need for new social infrastructure such as hospitals, prisons, educational facilities, and housing. Many governments see these as the most pressing areas for private involvement (Middleton, 2001).

### ***2.3.3 The significant growth of the project financing model***

Another factor in the rebirth of Public-Private Partnerships is the significant growth of the project financing model. The reason why the rebirth of PPPs is linked to the development of project finance is because the structure of a Partnership is identical to a typical project financing. The goal of a project finance structure is to allocate the risks of the project to the party best able to mitigate it.

Likewise, a PPP brings together a number of parties for an infrastructure investment, typically in the form of a special purpose vehicle (SPV) which is also the basis of every project financing. A special purpose vehicle is a separate legal entity established to undertake the activity described in a contract between the SPV and its client, or the public procurer in the case of a PPP. Financiers can turn only to the SPV for the repayment of their funds. The execution of the activity requires the involvement of a number of parties with whom the SPV enters into subcontracts. As such, the risks are spread among the different parties and the guarantee of a better execution increases.

Traditionally, the contractors and service providers sponsor the SPV and take equity stakes in it as a sign of their commitment to the project. In recent years, based on the Australian model, a new financier-led approach has developed. Specialized investment banks have taken a very active role in managing the SPV, taking 100% of the equity and underwriting capital market

issues and all other elements of the contract. Seemingly overnight, large amounts of money are being pooled into a variety of funds to solely invest in infrastructure (Raphael, 2007).

#### ***2.3.4 The changing forces of supply and demand sides of the economic markets***

Rousakis (2008) describes the changing forces of supply and demand as a factor contributing to the rebirth of public-private partnerships because of the following reasons:

- i. Most economies are currently experiencing a period of high infrastructure investment activity with an estimated upward growth in activity i.e. health infrastructure and transport infrastructure. Significant green field infrastructure investment is needed throughout most countries, driven by demographic growth and delayed maintenance;
- ii. Supply Side Factors contributing to P3 or PPP activity - This is due to the fiscal pressures at the state and local government levels due to cost escalations and an increased government awareness of and desire to mitigate operating risks; and
- iii. Demand Side Factors contributing to P3 activity - The demand side factors include; increased capital available for investment; infrastructure assets represent long duration investments with diversification benefits; infrastructure assets offer a stable return on investment; and equity investments provide high dividend yields with leveraged growth tied to GDP and/or inflation

#### **2.4 Public Private Partnership and traditional alternatives**

Not only have Public-Private Partnerships become increasingly used in recent decades, but the traditional alternatives to this type of financing are inherently limited. An examination of traditional alternatives and their limits leads to think that PPPs will become even more prevalent in the near future. Raphael (2007) describes the reasons as being:

##### ***(a) The political hurdles of tax financing***

Most economies have traditionally relied on tax revenues for the provision of infrastructure. Tax revenues offer limited prospect for the closing of the infrastructure funding gap as it is politically extremely difficult to impose tax increases. Besides the immediate burden that it puts on taxpayers, taxes are the most inflexible way of financing infrastructure projects and can limit the future capacity of the government to finance more projects. Moreover, taxes eliminate the use of leverage through which certain projects are made more efficient even though borrowing has disadvantages of its own.

***(b) The risks and disadvantages of public borrowing***

The benefit of borrowing money is that the government can accelerate project completion since it does not have to wait to have the funds necessary for the completion of the project. A general opposition to debt financing is that it creates a drag on future generations. Decades after the construction of a project, taxpayers will still be paying without receiving any new infrastructure. Borrowing does have implications long into the future. The funding received from a bond issue has to be repaid with interest which can potentially take funding away from other vital projects in the future. At first sight, a PPP and a bond issuance would yield the same upfront proceeds with the bonds being repaid thanks to toll revenues over time and the PPP proceeds coming from all expected future toll revenues. However PPPs eliminate the principal repayment that has to be made when the bonds mature which is an advantage of Partnerships over bonds.

Moreover, bond financing ties government's hands and state policy should ensure that adequate revenue is generated not only to pay for maintenance and operation but also for debt repayment. When accounting for debt repayment costs, every dollar spent on a given project would actually cost more than a dollar. As such, taxpayers will receive less than the taxes they contributed.

## **2.5 Types of Public Private Partnerships**



In a guide to local government, the Ministry of Municipal Affairs in British Columbia (1999) stated that public-private partnerships can vary in the degree of risk allocated between the partners, the amount of expertise required on the part of each partner to negotiate contracts and the potential implications for ratepayers.

The allocation of risk between the partners is a key consideration that affects various other aspects of partnership agreements, including rewards, investments and responsibilities. Table 2.2 provides an overview of the more common forms of public private partnership, starting with those that transfer the least amount of risk to the private partner.

**Table 2.2** *Types of Public Private Partnerships*

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
<b>1. Operations and Maintenance</b>	The local government contracts with a private partner to operate and maintain a publicly owned facility.	A broad range of municipal services including water and Wastewater treatment plants, solid waste removal, road maintenance, parks maintenance/landscape maintenance, arenas and other recreation facilities, parking facilities, sewer and storm sewer systems.	<ul style="list-style-type: none"> <li>• potential service quality and efficiency improvements</li> <li>• cost savings</li> <li>• flexibility in structuring contracts</li> <li>• ownership vests with local government</li> </ul>	<ul style="list-style-type: none"> <li>• collective agreements may not permit contracting out</li> <li>• costs to re-enter service if contractor defaults</li> <li>• reduced owner control and ability to respond to changing public demands</li> </ul>

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
<b>2. Design-Build</b>	The local government contracts with a private partner to design and build a facility that conforms to the standards and performance requirements of the local government. Once the facility has been built, the local government takes ownership and is responsible for the operation of the facility.	Most public infrastructure and building projects, including roads, highways, water and wastewater treatment plants, sewer and water systems, arenas, swimming pools and other local government facilities.	<ul style="list-style-type: none"> <li>• access to private sector experience</li> <li>• opportunities for innovation and cost savings</li> <li>• flexibility in procurement</li> <li>• opportunities for increased efficiency in construction</li> <li>• reduction in construction time</li> <li>• increased risk placed on private sector</li> <li>• single point accountability for the owner</li> <li>• fewer construction claims</li> </ul>	<ul style="list-style-type: none"> <li>• reduced owner control</li> <li>• increased cost to incorporate desirable design features or change contract in other ways once it has been ratified</li> <li>• more complex award procedure</li> <li>• lower capital costs may be offset by higher operating and maintenance costs if life-cycle approach not taken</li> </ul>
<b>3. Turnkey Operation</b>	The local government provides the financing for the project but engages a private partner to design, construct and operate the facility for a specified period of time. Performance objectives are established by the public sector and the public partner maintains ownership of the facility.	<p>This form of public private partnership is applicable where the public sector maintains a strong interest in ownership but seeks to benefit from private construction and operation of a facility.</p> <p>This would include most infrastructure facilities, including water and wastewater treatment plants, arenas, swimming pools, golf courses and local government buildings.</p>	<ul style="list-style-type: none"> <li>• places construction risk on the private partner</li> <li>• proposal call can control design and location requirements as well as operational objectives</li> <li>• transfer of operating obligations can enhance construction quality</li> <li>• potential public sector benefits from increased efficiency in private sector construction</li> <li>• potential public sector benefits from increased efficiency in private sector operation of the facility</li> <li>• construction can occur faster through fast-track construction techniques such as design-build</li> </ul>	<ul style="list-style-type: none"> <li>• reduced local government control over facility operations</li> <li>• more complex award procedure</li> <li>• increased cost to incorporate changes in design and operations once contract is completed</li> <li>• depending on the type of infrastructure, financing risk may be incurred by the local government</li> </ul>
<b>4. Wrap</b>	A private partner	Most infrastructure	• public sector does not	• future facility upgrades

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
<b>Around Addition</b>	finances and constructs an addition to an existing public facility. The private partner may then operate the addition to the facility for a specified period of time or until the partner recovers the investment plus a reasonable return on the investment.	and other public facilities, including roads, water systems, sewer systems, water and wastewater treatment plants, and recreation facilities such as ice arenas and swimming pools.	<p>have to provide capital funding for the upgrade</p> <ul style="list-style-type: none"> <li>• financing risk rests with private partner</li> <li>• public partner benefits from the private partner's experience in construction</li> <li>• opportunity for fast-tracked construction using techniques such as design-build</li> <li>• flexibility for procurement</li> <li>• opportunities for increased efficiency in construction</li> <li>• time reduction in project implementation</li> </ul>	<p>not included in the contract with the private partner may be difficult to incorporate at a later date</p> <ul style="list-style-type: none"> <li>• expense involved in alteration of existing contracts with the private partner</li> <li>• perceived loss of control</li> <li>• more complex contract award procedure</li> </ul>
<b>5. Lease-Purchase</b>	The local government contracts with the private partner to design, finance and build a facility to provide a public service. The private partner then leases the facility to the local government for a specified period after which ownership vests with the local government. This approach can be taken where local government requires a new facility or service but may not be in a position to provide financing.	Can be used for capital assets such as buildings, vehicle fleets, water and wastewater treatment plants, solid waste facilities and computer equipment.	<ul style="list-style-type: none"> <li>• improved efficiency in construction</li> <li>• opportunity for innovation</li> <li>• lease payments may be less than debt service costs</li> <li>• assignment of operational risks to private sector developer</li> <li>• improve services available to residents at a reduced cost</li> <li>• potential to develop a "pay for performance" lease</li> </ul>	<ul style="list-style-type: none"> <li>• reductions in control over service or infrastructure</li> </ul>
<b>6. Temporary Privatization</b>	Ownership of an existing public facility is transferred to a private partner who improves and/or expands the facility.	This model can be used for most infrastructure and other public facilities, including roads, water systems,	<ul style="list-style-type: none"> <li>• if a contract is well structured with the private partner, the municipality can retain some</li> </ul>	<ul style="list-style-type: none"> <li>• perceived or actual loss of control</li> <li>• initial contract must be written well enough to address all future eventualities</li> </ul>

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
	The facility is then owned and operated by the private partner for a period specified in a contract or until the partner has recovered the investment plus a reasonable return.	sewer systems, water and wastewater treatment plants, parking facilities, local government buildings, airports, and recreation facilities such as arenas and swimming pools.	control over standards and performance without incurring the costs of ownership and operation <ul style="list-style-type: none"> <li>the transfer of an asset can result in a reduced cost of operations for the local government</li> <li>private sector can potentially provide increased efficiency in construction and operation of the facility</li> <li>access to private sector capital for construction and operations</li> <li>operational risks rest with the private partner</li> </ul>	<ul style="list-style-type: none"> <li>private sector may be able to determine the level of user fees, which they may set higher than when under local government control</li> <li>difficulty replacing private partner in the event of a bankruptcy or performance default</li> <li>potential for local government to reemerge as the provider of a service or facility in the future</li> <li>displacement of local government employees</li> <li>labour issues in transfer of local government employees to the private partner</li> </ul>
<b>7. Lease-Develop-Operate or Buy-Develop-Operate</b>	The private partner leases or buys a facility from the local government, expands or modernizes it, then operates the facility under a contract with the local government. The private partner is expected to invest in facility expansion or improvement and is given a specified period of time in which to recover the investment and	Most infrastructure and other public facilities, including roads, water systems, sewer systems, water and wastewater treatment plants, parking facilities, local government buildings, airports, and recreation facilities such as arenas and swimming pools.	<ul style="list-style-type: none"> <li>if the private partner is purchasing a facility, a significant cash infusion can occur for the local government</li> <li>public sector does not have to provide capital for upgrading</li> <li>financing risk can rest with the private partner</li> <li>opportunities exist for increased revenue generation for both partners</li> <li>upgrades to facilities or infrastructure may result in service quality</li> </ul>	<ul style="list-style-type: none"> <li>perceived or actual loss of control of facility or infrastructure</li> <li>difficulty valuing assets for sale or lease</li> <li>issue of selling or leasing capital assets that have received grant funding</li> <li>if a facility is sold to a private partner, failure risk exists—if failure occurs, the local government may need to reemerge as a provider of the service or facility</li> <li>future upgrades to the facility may not be included in the contract</li> </ul>

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
	realize a return.		<p>improvement for users</p> <ul style="list-style-type: none"> <li>• public partner benefits from the private partner's experience in construction</li> <li>• opportunity for fast-tracked construction using techniques such as design-build</li> <li>• flexibility for procurement</li> <li>• opportunities for increased efficiency in construction</li> <li>• time reduction in project implementation</li> </ul>	and may be difficult to incorporate later
<b>8. Build-Transfer-Operate</b>	The local government contracts with a private partner to finance and build a facility. Once completed, the private partner transfers ownership of the facility to the local government. The local government then leases the facility back to the private partner under a long-term lease during which the private partner has an opportunity to recover its investment and a reasonable rate of return.	Most infrastructure and other public facilities, including roads, water systems, sewer systems, water and wastewater treatment plants, parking facilities, local government buildings, airports, and recreation facilities such as arenas and swimming pools.	<ul style="list-style-type: none"> <li>• public sector obtains the benefit of private sector construction expertise</li> <li>• public sector obtains the potential benefits and cost savings of private sector operations</li> <li>• public sector maintains ownership of the asset</li> <li>• public sector ownership and contracting out of operations limits any provincial and federal tax requirements</li> <li>• public sector maintains authority over the levels of service(s) and fees charged</li> <li>• compared to a Build-Operate- Transfer model, avoids legal, regulatory and tort liability issues</li> <li>• under <i>Occupiers' Liability Act</i>, tort liability can be avoided</li> <li>• government control of operational performance,</li> </ul>	<ul style="list-style-type: none"> <li>• possible difficulty in replacing private sector entity or terminating agreements in event of bankruptcy or performance default</li> </ul>

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
			<p>service standards and maintenance</p> <ul style="list-style-type: none"> <li>• ability to terminate agreements if service levels or performance standards not met, although facility would continue to permit repayment of capital contributions and loans and introduction of new private partner</li> <li>• construction, design and architectural savings, and likely long-term operational savings</li> </ul>	
<b>9. Build-Own-Operate-Transfer</b>	The private developer obtains exclusive franchise to finance, build, operate, maintain, manage and collect user fees for a fixed period to amortize investment. At the end of the franchise, title reverts to a public authority.	Most public infrastructure services and facilities, including water and wastewater systems, recreation facilities, airports, local government administration and operations buildings, parking facilities and solid waste management facilities.	<ul style="list-style-type: none"> <li>• maximizes private sector financial resources, including capital cost allowance</li> <li>• ensures the most efficient and effective facility is constructed, based on life-cycle costs</li> <li>• allows for a private sector operator for a predetermined period of time</li> <li>• the community is provided with a facility, without large up-front capital outlay and/or incurring of long-term debt</li> <li>• all “start-up” problems are addressed by the private sector operator</li> <li>• access to private sector experience, management, equipment, innovation and labour relationships may result in cost savings</li> <li>• risk shared with private</li> </ul>	<ul style="list-style-type: none"> <li>• facility may transfer back to the public sector at a period when the facility is “work” and operating costs are increasing</li> <li>• public sector loses control over the capital construction and initial mode of operations</li> <li>• initial contract must be written sufficiently well to address all future eventualities</li> <li>• the private sector can determine the level(s) of user fees (unless the public sector subsidizes use)</li> <li>• less public control compared to Build-Transfer-Operate structure</li> <li>• possible difficulty in replacing private sector partner or determining agreements if bankruptcy or performance default</li> </ul>

Type of PPPs	Features	Local Government applications	Advantages	Disadvantages
			sector	
<b>10. Build-Own-Operate</b>	The local government either transfers ownership and responsibility for an existing facility or contracts with a private partner to build, own and operate a new facility in perpetuity. The private partner generally provides the financing.	Most public infrastructure and facilities, including water and wastewater systems, parking facilities, recreation facilities, airports, local government administration and operations buildings.	<ul style="list-style-type: none"> <li>• no public sector involvement in either providing or operating the facility</li> <li>• public sector can “regulate” the private sector’s delivery of a “regulated/monopolistic” service area</li> <li>• private sector operates the service in the most efficient manner, both short-term and long-term</li> <li>• no public sector financing is required</li> <li>• income tax and property tax revenues are generated on private facilities, delivering a “public good”</li> <li>• long-term entitlement to operate facility is incentive for developer to invest significant capital</li> </ul>	<ul style="list-style-type: none"> <li>• the private sector may not operate/construct the building and/or service “in the public good”</li> <li>• the public sector has no mechanism to regulate the “price” of the service, unless it is a specifically regulated commodity</li> <li>• the good/service being delivered is subject to all federal, provincial and municipal tax regulations</li> <li>• no competition, therefore necessary to make rules and regulations for operations and to control pricing</li> </ul>

*(After Ministry of Municipal Affairs, British Columbia, 1999)*

## 2.6 Considering a Public Private Partnership

A public private partnership may not be the best option for delivering every public service or project. Local government should undertake a cautious approach and examine all relevant factors and issues when considering this type of arrangement. The different forms of public private partnership vary in terms of how risks and responsibilities are allocated. They also vary in complexity and the degree of expertise required to successfully negotiate required contracts (Ministry of Municipal Affairs, British Columbia, 1999).

Local governments should not assume that public private partnerships provide easy outs to difficult servicing issues. They should expect that increased transfer of risk will result in higher expectations for reward by the private sector and that the negotiation of contracts may require a high degree of expertise. A review of the possible obstacles and constraints to public private partnership may eliminate it as an option for delivery of a particular service or infrastructure. If the obstacles and constraints can be satisfactorily addressed, there are still a number of other considerations before proceeding to implementation. The first of these is whether the benefits of public private partnership outweigh the costs.

### **2.6.1 Potential benefits of Public Private Partnerships**

Harris (2006) provided an overview of some of the potential benefits and risks associated with public private partnerships. Public private partnerships are not the solution for the delivery of all services. There are risks in proceeding with public private partnerships without critically examining their suitability to specific circumstances. However, local government can realize important benefits when public private partnerships are used in the appropriate context. Potential benefits include:

#### ***i. Cost savings***

With public private partnership, local government may be able to realize cost savings for both the construction of capital projects as well as the operation and maintenance of services. Construction cost savings can often be realized by combining design and construction in the same contract. The close interaction of designers and constructors in a team can result in more innovative and less costly designs. The design and construction activity can be carried out more efficiently, thereby decreasing the construction time and allowing the facility to be put to use more quickly. Overall costs for professional services can be reduced for inspections and contract management activities. As well, the risks of project overruns can be reduced by design-build contracts.

Cost savings can also be realized by local government in the operation and maintenance of facilities and service systems. Private partners may be able to reduce the cost of operating or



maintaining facilities by applying economies of scale, innovative technologies, more flexible procurement and compensation arrangements, or by reducing overhead.

**(b) *Risk sharing***

With public private partnership, local government can share the risks with a private partner. Risks could include cost overruns, inability to meet schedules for service delivery, difficulty in complying with environmental and other regulations, or the risk that revenues may not be sufficient to pay operating and capital costs.

**(c) *Improved levels of service or maintaining existing levels of service***

Public private partnerships can introduce innovation in how service delivery is organized and carried out. It can also introduce new technologies and economies of scale that often reduce the cost or improve the quality and level of services.

**(d) *Enhancement of revenues***

Public private partnerships may set user fees that reflect the true cost of delivering a particular service. Public private partnerships also offer the opportunity to introduce more innovative revenue sources that would not be possible under conventional methods of service delivery.

**(e) *More efficient implementation***

Efficiencies may be realized through combining various activities such as design and construction, and through more flexible contracting and procurement, quicker approvals for capital financing and a more efficient decision-making process. More efficient service delivery not only allows quicker provision of services, but also reduces costs.

**(f) *Economic benefits***

Increased involvement of local government in public private partnerships can help to stimulate the private sector and contribute to increased employment and economic growth. Local private firms that become proficient in working in public private partnerships can “export” their expertise and earn income outside of the region.

Furthermore, Norment (2006) describes the following as expected outcomes or benefits from public-private partnerships:

- i. Increased pool of financial resources in the district for service delivery;
- ii. Increased social benefits to the residents as a result of joint interdependent initiatives;
- iii. Reduced local Government exposure to commercial risks by sharing risks and rewards;
- iv. Regular maintenance of assets overtime and reduced long term costs.

### **2.6.2 Potential risks of Public Private Partnerships**

As with conventional forms of service delivery, there are risks as well as potential benefits associated with public private partnerships. Local governments can reduce or eliminate the risks by understanding what they are and addressing them through well-conceived negotiations and contractual arrangements, and the involvement of stakeholder groups (Smith, 2006). According to Smith (2006), potential risks include:

#### **(a) Loss of control by local government**

Public private partnerships, by their nature, involve a sharing of risks, benefits and decision making between the partners. Public private partnerships that involve significant investments and risks by the private partner often provide for greater involvement of the private partner in decisions concerning how services are delivered and priced. This often leads to concerns about who controls the delivery of services. The issue of control needs to be addressed at the time the project is defined and kept in mind when the contract is negotiated. In the final

analysis, local government has the authority and responsibility to establish servicing standards and to ensure that the public interest is protected.

**(b) Increased costs**

Not all local governments consider the true costs of providing services when establishing their pricing policies for fees for services. For example, the costs of overhead or administration and depreciation of assets are often not included in the pricing of individual services. In some cases, there are explicit subsidies for specific services. The delivery of services through public private partnerships requires pricing policies and fees to reflect all relevant costs. This can have the effect of increasing user fees for specific services. The cost of managing public controversy over increased fees or developing complex policies for staging fee increases can often negate the value of public private partnerships for specific services.

**(c) Political risks**

Few local governments have extensive experience with public private partnerships. The combination of inexperience by local government and stakeholder unfamiliarity with public private partnerships may result in higher political risks. Local governments may wish to reduce potential risks by initially entering into fewer complexes and better understood public private partnership contracts.

**(d) Unacceptable levels of accountability**

Certain local government services are more sensitive than others in terms of public demand for accountability and responsiveness. With public private partnerships, the lines of accountability for the provision of services are less clear to the public than under conventional service delivery. This may result in public criticism of the partnership arrangement and the private partner, or require increased involvement of the local government in ensuring compliance and responding to public demands.

#### **(e) Unreliable service**

Private partners may be prone to labour disputes, financial problems or other circumstances that may prevent them from honouring their commitments. Public private partnership contracts should anticipate such difficulties and put in place measures to deal with them.

#### **(f) Inability to benefit from competition**

Competition among private partners to secure the right to enter into a public private partnership is an important benefit for local government. Competition leads to innovation, efficiency and lower costs. Local governments may not be able to benefit from public private partnerships if there are only a limited number of potential private partners with the expertise or ability to respond to a request for proposals.

#### **(g) Reduced quality or efficiency of service**

If not properly structured, public private partnership contracts can result in a reduction in service quality, inefficient service delivery or a lack of proper facility maintenance. For example, cost-plus contracts provide little incentive for the private partner to maintain quality or increase efficiency. Local governments should also consider the life-cycle cost approach in establishing evaluation criteria for projects or services.

#### **(h) Bias in the selection process**

As with conventional forms of service delivery, there is always the potential for local government to be accused of bias in selecting proponents. This may be more prevalent with public private partnerships given that “low bid” may not always win the contract if the local government has established other criteria (e.g., value for money). The potential for accusation of bias can be reduced through well-developed policy and procedures, and by ensuring transparency in dealing with potential private partners.

### **(i) Labour issues**

Even though collective agreements and labour laws apply to public private partnership arrangements, there could be adverse reaction from labour unions or local government staff. New Zealand PPP Policy (2006) described that most labour risks are mainly in the tendering and contracting stages.

### **(j) Tendering and negotiation**

PPP contracts are typically much more complicated than conventional procurement contracts. This is principally because of the need to anticipate all possible contingencies that could arise in such long-term contractual relationships. Each party bidding for a project spends considerable resources in designing and evaluating the project prior to submitting a tender. In addition, there are typically very significant legal costs in contract negotiation. The cost of both successful and unsuccessful bids is, in effect, built into total project costs. The Australian Council for Infrastructure Development has expressed the view that “unless tendering processes are well run it is possible that the benefits of using a PPP for delivering the project may be outweighed by the tendering costs” (Australian Council for Infrastructure Development, 2002). Under conventional procurement, the sunk costs of private contractors are much smaller and contracts (e.g. for operations) often do not exceed 5 years. The risks to be covered off in the contract are therefore significantly less.

### **(k) Contract renegotiation**

Given the length of the relationships created by PPPs and the difficulty in anticipating all contingencies, it is not unusual for aspects of the contracts to be renegotiated at some stage. Wherever possible, provisions are included in the contracts that spell out how variations are to be priced. But, given the length of time spanned by the contract, it is almost inevitable that circumstances will arise which cannot be foreseen.

Where the need for renegotiation comes from the public agency (which, it appears, is often the case, perhaps as a result of a change in government policy) and no pricing rule is contained in the contract, the Crown can end up paying a heavy price, since the price is not determined in a competitive bidding context. The cost of such changes is difficult to factor into the original project evaluation, since by definition it is unanticipated.

### **(l) Performance enforcement**

One of the difficulties with performance specification in the area of service delivery is that performance sometimes has dimensions which are hard to formulate in a way that is suitable for an arms-length contract. Examples include maintaining good customer relations, and not creating public relations blunders which rebound on the government. In the case of building a motorway through a dense urban setting, a public roading authority will sometimes find it difficult to specify all performance elements in service level terms.

The reputation effect and the prospect of repeat business can sometimes provide incentives to achieve “soft” performance targets. For example, unsatisfactory performance by a prison management company will affect its reputation and therefore its ability to obtain contracts elsewhere.

### **(m) Political acceptability**

Given the difficulty in estimating financial outcomes over such long periods, there is a risk that the private sector party will either go bankrupt, or make very large profits. Both outcomes can create political problems for the government, causing it to intervene. Examples of the former include the National Air Traffic Services (NATS), which encountered financial difficulties after 11 September 2001. Patronage didn’t increase to the levels expected, causing the operator to threaten to fail. The government agreed to increase the operating subsidy.

The “public sector comparator” used in some other countries is a useful tool, but is not evidence that a PPP is superior to conventional private sector procurement.

Both kinds of risk are often reduced by including in the contract loss sharing or profit sharing provisions. But such provisions reduce the extent of risk transfer, and therefore the advantages of PPP (Raphael, 2007).

### **2.6.3 Potential challenges to be addressed**

According to Norment (2006), the following are the challenges of bringing the public and private sectors together:

- i. **Failure to Communicate** – It is important to note that generally the two parties don't speak the same language. While the business speaks of customer satisfaction, return on investment, risk or reward evaluation; the public speaks of responsibility, accountability and risk avoidance as seen in table 2.1 above. He argues that the private sector strengths are due to the result of market competition such as management efficiency, newer technologies, workplace efficiencies, cash flow management, personnel development and shared resources while the public sector's strengths are as the result of serving the public trust through legal authority, protection of procurement policies, broad prospective in balancing the competing goals to meet public needs, personnel (dedicated but constrained), capital resources and underutilized assets.

Smith (2006) reveals that the secret to a successful partnership is to balance of the strengths of each sector so that the experience of one sector helps another. The process of partnering means a way of attracting the interest of the private sector into the public activities. The private sector is in a need to make a return on their investment while realizing that there are up-front costs at risk.

- ii. **Political environment** – with the current state of flux in most African politics, road ahead is not positive. Dealing with the African financial community is also a major challenge because most of the financial communities lack a debt bidding competition. There is also no interest in providing equity by development banks, insurance and pension funds. Most public sector PPP sponsors lack significant capital grant to reduce the amount of debt that must be accessed (South African PPP Unit, 1999).

- iii. **Lack of capacity** - Dealing with the lack of capacity within certain governmental entities to undertake PPPs. There is a massive skills shortage in most countries which affects governmental entities as well; i.e. lack of capacity which is particularly acute in terms of the appointment of a Project Officer.
- iv. **Trust in each other** - With a desire to provide for the public sector, most governments are faced with many infrastructure delivery challenges which call for the need for transparency and understanding the other's position which can best be achieved through a public-private partnership. Each party in the partnership has its independent goals and objectives, especially economically, which create the need for trust in each other.

## **2.6.5 Opportunities in PPPs**

### **2.6.5.1 Opportunities in the public sector**

With shrinking budgets in most national budgets, there is a rise in the number of aging infrastructure which need maintenance, replacements and others expansion. Furthermore, most governments are challenged with constituent demands that need a helping hand. Due to the financial challenges, these governments are only able to provide management authority on public sector infrastructure.

Public private partnerships are a suitable method of delivering most services commonly provided by local government and are generally applicable to most components of service delivery.

#### ***2.6.5.1.1 Application of PPPs in various local government services***

The types of services that could be provided through public private partnerships will vary from local government to local government based on the policies of their Councils or Boards. Generally, most services provided by local government could benefit from bringing the strengths of the private and public sectors together. Public private partnerships may be less



suitable for local government services to which access cannot be restricted (such as services with “public good” characteristics, including by law enforcement, environment protection and social services). They may also be less suitable for essential services (such as policing, fire protection and other emergency services). Local government officials and public groups tend to be more receptive to the provision of more specialized recreation facilities, solid and liquid waste management or utilities through public private partnerships.

#### ***2.6.5.1.2 Aspects of service delivery that lend themselves to public private partnerships***

Virtually all aspects of service delivery lend themselves to public private partnership, including project design, project management, construction and procurement, financing, operations and management, maintenance, marketing of services and communications.

#### **2.6.5.2 Opportunities in the private sector**

With a rise in economic development, the private sector has been able to provide accelerated delivery. This works well for the public sector as the private sector is willing to capitalize on public sector resources and many underutilized Assets. Through this, the private sector works with the public sector in the delivery of public sector infrastructure.

##### ***2.6.5.2.1 When to partner with the private sector***

In the guide to local Government of British Columbia, Ministry of Municipal Affairs (1999) urges local governments to consider partnerships with the private sector where any of the following circumstances exist:

- i. Service cannot be provided with resources or expertise of the local government alone;
- ii. A private partner would provide a level of service higher than local government could provide;
- iii. A private partner would allow the service to be implemented earlier than local government;

- iv. There is support from the users of the service for the involvement of a private partner;
- v. There is an opportunity for competition among prospective private partners;
- vi. Absence of regulatory prohibitions to involve a private partner in the provision of services;
- vii. The output of the service can be measured and priced easily;
- viii. The cost of the service or project can be recovered through the implementation of user fees;
- ix. The project or service provides an opportunity for innovation;
- x. There is a track record of partnerships between local government and the private sector;
- xi. There are opportunities to foster economic development.

If none of the above conditions exist, public private partnerships should not be considered.

## **2.7 Project and service delivery through Public Private Partnerships**

Most local governments have adopted plans, policies and procedures as well as the organizational resources and support required for the delivery of services. A critical component of effective service delivery is the clear identification of roles and responsibilities for specific services. Local governments will need to prepare for the unique requirements of public private partnerships. This does not necessarily mean increasing the size or the complexity of the organization or changing the way in which local government presently makes decisions on service delivery. Rather, it means making the necessary adjustments to existing processes and arrangements for effective public private partnerships (Ministry of Municipal Affairs, 1999).

### **2.7.1 Reviewing opportunities for Public Private Partnerships**

In a paper review, Ministry of Economic Development, Financial Services and Corporate Affairs in Mauritius (2003) states that the potential for service delivery through public private partnerships will reflect local government policy and expectations. For example, a local

government may take a policy position that states public private partnerships should not be considered at all or considered only in special circumstances. At the other end of the spectrum, the local government may undertake a systematic review of how it presently delivers services to assess the relevance of public private partnerships to both existing and future service delivery. Irrespective of the position they ultimately take, local governments need to carefully consider the relevance of public private partnerships to the delivery of services in their communities, in particular, to services currently being provided, future services the local government is contemplating and unsolicited proposals advanced by the private sector (Ibid, 2003).

***i. Current services and public private partnerships***

Local governments may encounter resistance when considering public private partnerships to change the way existing services are delivered. There may be general public resistance to change, particularly if a local government has provided high quality and efficient service. Those benefitting from the service may fear a decrease in service, an increase in the price of the service, or both with the involvement of a private partner. There may also be resistance from local government staff and labour unions threatened by potential changes and the possible impact on job security, wages and benefits (Smith, 2006).

On the other hand, if the local government's performance has fallen short of expectations there could be public support for changes to the method of existing service delivery. There may also be greater support for expansion or upgrading of existing services to provide a higher quality service. A key issue local government must address before considering public private partnerships is the true cost of providing existing services. Many local governments lack benchmarking tools, such as accurate accounting for unit costs and other costs associated with providing a service (Ibid, 2003). This issue is discussed in more detail later in this section.

***ii. Future services and public private partnerships***

Local governments may also consider public private partnerships for the delivery of future services, for example, new types of services not presently provided in the community and

modification of existing services to provide a higher level of servicing (e.g. water treatment). Future servicing initiatives will generally be identified in long-range financial plans, strategic servicing plans where these have been prepared, official community plans and servicing studies or strategies related to specific types of services (Ibid, 2003).

The public and other stakeholders may be more prepared to consider public private partnerships for services that are not presently provided or for modification and upgrading of existing services. This would be particularly evident in cases where the provision of new or upgraded services may not be possible or feasible under conventional service delivery (Ibid, 2003).

### ***iii. Unsolicited proposals and public private partnerships***

Private sector proponents may submit unsolicited proposals when they believe that they can provide a service to the benefit of the public, the local government and to themselves. The difficulty always is in getting the balance right between encouraging such companies to submit project ideas without losing the transparency and efficiency gains of a well-conceived competitive tender process. This difficulty is exacerbated when government officials lack the capacity to evaluate unsolicited proposals objectively (Ibid, 2003).

## **2.7.2 Creating successful public-private partnerships**

While the benefits and advantages of PPP can be significant, they are not automatic. Rather, the positive outcomes have to be earned through well designed projects, thorough due diligence and competitive and transparent procurement. There are thus certain key preconditions critical in delivering successful outcomes. The Ministry of Works and Supply Draft PPP Policy (2006) has identified these preconditions as:

### ***(i) Feasibility***

Norment (2006) argues that PPP's should be affordable. The assessment of affordability by the procuring body is as important for privately or part privately financed projects as it is for those which are publicly financed. Affordability will need to be the cornerstone of all PPP

projects. PPP options must be affordable both to Government and the public, given other priorities and commitments. The rationale for PPP is improved management of scarce resources, better risk allocation and more efficient and cost effective delivery of services. Smith (2006) argues that it will always need to be borne in mind, however, that while the private sector may be willing to finance and deliver infrastructure and services through PPP, only users or taxpayers can pay for them. Affordability thus acts as a real constraint, and public bodies will need to give serious consideration to the selection of potential PPP projects, ensuring always that their choices are in line with Government's policy priorities and objectives. PPP provides real and exciting prospects for new forms of procurement, financing and operation in ways that are likely to result in improved management of scarce resources. Government's PPP programme should not, however, be seen simply as an opportunity for public bodies to undertake projects that would ordinarily not get approval through normal budgetary approval processes (Rao, 2008; Ministry of Works and Supply Draft PPP Policy, 2006).

#### **(ii) Bankable Projects for Financiers and Developers**

PPP's should be bankable as financiers will be reluctant to commit finance when a project entails high participation costs, unreasonable risk transfer or lengthy and complex contract negotiations (Rousakis, 2008). PPP Projects will remain attractive to the private sector through cost recovery pricing policy. This is critical to ensure that the project developer or investor is assured of steady and predictable tariffs over the life of the project in order to guarantee service delivery. In order to assure project developers or investors of the cost recovery pricing policy, it will be important to develop, implement and enforce a comprehensive and coherent legal and regulatory framework which is regulated, transparency and minimises contract disputes (Ministry of Works and Supply Draft Policy, 2006; Wibowo and Patria, 2007).

#### **(iii) Value for Money**

Norment (2006) suggests that PPPs should provide value for money by having good economic value which is not necessarily the same as least cost and should focus on service

outcomes or outputs rather than on the provision of assets. Value for money will be manifested through better coordination and synergy between the phases of design, construction and operation. It will provide an innovative design, application of reengineering principles and efficient management techniques. In value for money, emphasis is placed on quality of service offered to the end user or customer with an approach aimed at minimizing total project costs throughout the entire project life cycle of capital investment, maintenance and operations.

Furthermore, it entails more effective use of capital coupled with the generation of complementary revenue. Value for money test could be determined through the use of the Public sector comparator model (Ministry of Works and Supply Draft Policy, 2006).

#### **(iv) Risk Allocation**

Wibowo and Patria (2007) suggest that PPPs should provide for optimal risk allocation between the public and private sectors. PPP type projects always comprise a high level of risk, due to the magnitude of the financial stakes involved, uncertainties over construction and operating costs, and revenue related uncertainties. PPP relies on balancing the allocation of risk and enables transfer of the same to the private party when the said party is better able to mitigate/ manage the risk than the public authority. In return, the public authority significantly reduces its risk exposure while overseeing project optimization efforts (Rao, 2008).

#### **(v) Economic and Social Benefits**

PPP projects should always be evaluated for economic and social benefits rather than focus on the financial considerations. PPP's underlying principle stems from the fact that the public authority remains responsible for service provided to the public, without necessarily being responsible for the corresponding investment. Through PPP's the public authority is relieved of all investment related obligations and as such is able to concentrate on service quality control, while the private operator seeks to optimize its capital outlay through investments in public sector infrastructure (Ministry of Works and Supply Draft PPP Policy, 2006).

#### **(vi) Citizen's Empowerment**

The implementation of PPP projects should have due consideration for the empowerment of Zambian citizens as a strategy for economic growth and sustainability. As such, PPP undertakings need to provide for the participation of local investors (Ministry of Works and Supply Draft PPP Policy, 2006).

#### **(vi) Decentralization**

PPP should be extended to local Government to enable local municipalities to provide infrastructure through PPP schemes (Ibid, 2006).

#### **(viii) Social Responsibility**

The ultimate goals of PPP are to enable effective provision of infrastructure and related services, thus ensure that these amenities are also made available to all levels of society (Ibid, 2006).

#### **(ix) Unsolicited Bids**

According to Ministry of Works and Supply Draft PPP Policy (2006), potential PPP Projects will not always be known and tendered to the public for submission of bids. It is possible that a PPP Project could be initiated by the Private Sector where no bids have been requested. Such a proposal from a developer or investor will be treated as an unsolicited bid. This PPP policy will allow for unsolicited bids as long as the following conditions are met:

- i. The Proposer of the Project should register the project with the PPP Unit;
- ii. The PPP Unit will evaluate the proposal and determine feasibility of the project;
- iii. The PPP Unit will tender the project to the public through a transparent process;
- iv. Once the submitted bids are evaluated, a preferred bidder will be selected and a draft contract will be prepared; and

- v. The original Proposer of the project will then be invited to match / or better the preferred bid.

It is important to note that unsolicited bids will encourage creativity and innovation on the private sector and will lead to quality bids being submitted.

Furthermore, Bracey and Moldovan (2006) recommended that in order for the public sector to manage risks on PPP projects, they should not view PPP only as a source of financing projects, but should provide an appropriate legal and regulatory framework to address risks in PPP projects. They suggested that the public sector should address a number of issues including an appropriate procurement process which is transparent and where award decisions were based on objective evaluation criteria; improving the regulatory environment and governance with appropriate human capital to manage the process. The financing of PPP projects could also be challenging for developing countries. This was particularly critical as investors in PPP projects were likely to make their decision based on political and regulatory risk and the ability of the projects to provide enough revenue to cover all costs (Castalia 2005). They suggested that even if the project would provide enough revenue to recoup the cost, political and regulatory risks would play a big part in the investor's decisions. They argued that governments in most Sub Sahara African countries were worst payers and therefore this would undermine the revenue stability of projects.

Table 2.3 presents content analysis of the literature reviewed in this chapter.

**Table 2.3 Content analysis of literature reviewed**

S/N	Name of Author (s)	Date of publication	Title of Publication	Lessons learnt	Critics on the methodology/c
1.	Cairo Patrick	2006	A review and outlook of Public Private Partnerships (PPP) in the water sector	The paper gives fundamental principles of PPP's (value created and overall experience), experiences from different case studies with successes and Failures and why. It also shows future expectations of PPP's in relation to lessons learned	The paper is well presented th does not show a methodologic certain issues mentioned.



2.	Chege L.W and Rwelamila P.D.	2001	Private Financing of Construction Projects and Procurement system; An integrated approach,	PPP as a procurement method; various financial approaches in PPPs that would insinuate private sector participation in public sector delivery.	The publication was concise clear methodology.
3.	Claro Jorge	2008	Current Trends in International Public Sector Procurement and their impact on Financial Management	The benefits of PPP with the financial implications in relation to other procurement mechanisms.	The write-up is good in te content except it does not show the methodology.
4.	Commission of the European Communities	2004	Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions	Describes the agreements between the public and private sector. It shows the need for understanding each party in entering into PPP agreements	The paper is gives a good readi
5.	Darrin G and Lewis M	2004	Public Private Partnerships, The worldwide revolution in infrastructure provision and project finance	The paper presents the evolution of project finance to provide infrastructure with different perspectives from different regions.	
6.	Davis J.	2007	<i>APTA Public Private Partnerships Task Force: Policies and Principles</i>	Provides recommendations on how to implement a PPP in a way that will deliver the project. The paper discusses the varying roles of PPP parties and how they can complement each other	The paper does not show its sc methodology.
7.	Harris S.	2006	Implementing a PPP Programme: Key messages for Government		
8.	Heathcote C.	2003	Public Private Partnership: UK and other international experience	<ul style="list-style-type: none"> <li>• All PPP programmes are unique and designed according to national circumstances</li> <li>• There is strong and growing evidence-base from countries with successful PPP programmes</li> <li>• Time spent creating the right environment for PPP's at the beginning will payback many times over</li> <li>• Allowing the participating country to move rapidly to a platform of "best practice"</li> </ul>	The contents are concise with methodology
9.	Kazunga T.	2006	Resource mobilization for service provision in Zambia: Proposal for Public Private Partnership	The paper focuses on ways to mobilize resources for service provision using PPP in accessing shelter and urban services in Zambia. Using case studies, it describes PPP, possible challenges, expected outcomes to provide resources to the public sector.	The paper does not describe where PPP have worked in Zar does not also recommend he resources could be mobiliz service provision through PPP.
10.	Masambaji C.N and Ssegawa J.K	2008	EVA as a possible tool for effective project control in developing	Defines Earned Value Analysis as a project delivery control measure. The paper provides a step by step description of how this analysis can be conducted with	The paper has a clear and c description of EVA as a p project control technique to e project delivery.

			countries	expected results.	
11.	Ministry of Economic Development, Financial Services and Corporate Affairs in Mauritius	2003	<i>Public Sector Procurement evaluation, Mauritius.</i>	Describes many options of procurement available to the public sector and their adverse effects on project delivery.	The paper is a good presentation of the trends in Mauritius.
12.	Ministry of Municipal Affairs	1999	Public Private Partnership: <i>A Guide for Local Government</i>	Different dimensions in PPP with a concise approach from the first step in PPP creation until delivery or dissolution of the partnership. It gives clear principles that could enable project delivery with clear controls.	The guidelines are clear and concise. They present a holistic approach to acquiring successful PPP projects in any public sector.
13.	Ministry of Works and Supply	2006	<i>Draft Policy for Public Private Partnership</i>	The guidelines highlight the need for PPP in Zambia.	The paper does not provide methodology to show a cross-view on PPP issues.
14.	National Council for Public Private Partnerships	2002	<i>For the Good of the People Using Public- Private Partnerships to Meet America's Essential Needs</i>	Justifies the need for PPPs and its importance while giving emphasis on the need to create a fair playground by the public sector for the private sector.	The different presentation gives a literature review with experiences around the world.
15.	New Zealand PPP Policy		New Zealand PPP Policy	How the PPP policy was implemented in New Zealand; the obstacles to PPP implementation and the outcome so far	The paper does not show how the policy was developed.
16.	Norment R.	2006	Fundamental and Issues of Public Private Partnerships	The paper brings out principles and fundamentals of PPPs with keys to a successful partnership; and how both parties could be satisfied with what the other has to offer.	Provides a good articulation of fundamentals with a good selection of case studies
17.	Public Private Partnership Act (Laws of Zambia)	2009	Public Private Partnership Act, 2009	Describes the PPP Act and how the PPP Unit will acquire PPP projects.	
18.	Raphael V.	2007	Public-Private Partnerships: Can the United States learn from the French experience to address its highway	The paper explains PPP as an old model of project financing which has undergone a lot of adjustments to meet the different and ever-changing economic environment. It justifies that USA can learn something from	The paper provides a concise review with a clear methodology on issues. The case studies are elaborated.

			funding needs?	the experiences of the French PPP approach.	
19.	Rao K.V	2008	Alternative Financing	Provides a concise description of alternative financing to projects and their financial implications. It describes the Value for Money available in the different PPP models.	The content are good and conc
20.	Rousakis T.	2008	<i>Public Private Partnerships (P3): Overview and Opportunities,</i>	The paper brings out more clearly the economics side of PPP and how the Value for Money can be achieved	The paper is a good prese though it does show much d some descriptions
21.	Savas, E.		<i>Privatization and Public Private Partnership</i>	Defines PPP in relation to Privatization, showing how the principle are inter-related.	The research paper is good tho contents are not concise to give the dimension of the authc
22.	Seltzer D.	2008	P3 or Not P3: That Is the Question	Describes the PPP process and how different regions have utilized the partnerships to bring in a component of project delivery	The methodology is biased experiences and eliminates the side of PPP
23.	Smith A.L	2006	Public Private Partnerships Objectives and Governance,	Gives objectives of PPPs and some governance issues in achieving sustainable development	The contents in the paper an though it does not clearly sh methodology.
24.	South African PPP Unit (National Treasury – PPP Unit),	2000	Public Private Partnership (PPP) Unit	Explains procedures in acquisition of PPP projects in South Africa and cites many interesting case studies where and how PPP where delivered or not delivered.	The guidelines are clear and forward.
25.	Williams J.F	2003	<i>P3 Project Management</i>	The publication gives a detailed and explicit step by step project management which indicates the value in managing PPP projects.	The publication is good thou discussion is too brief

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## **2.8 Summary**

Chapter two reviewed literature on Public Private Partnerships using a global perspective. Forms of partnerships used in various countries were explored. The next chapter reviews literature in the local context.

## **CHAPTER 3: LITERATURE REVIEW FROM THE ZAMBIAN CONTEXT**

### **3.1 Introduction**

Public and private sectors have over the years had a mutually exclusive existence. Where one sector was prominent, the other was virtually non-existent; yet they affected each other significantly. This could be noted in the way economies were structured before and after privatisation. Further, the distinction between the public and private sectors had been evident in the diverse systems within which they operate (Mukela, 2007).

Despite the differences between the public and private sectors, it has been recognized that the public and private sectors can stimulate economic growth and sustain development through concerted efforts. This could be made possible through public-private partnerships. The Zambian Government has been embarking on economic reforms with the assistance of co-operating partners. Public Private Partnerships (PPPs) were introduced as part of the structural reforms aimed at achieving economic growth and development. (Ibid, 2007).

Zambia like many other developing countries has been striving to meet its infrastructure development needs. However, as the country relied on donor funding, the financing of such projects from the public purse became challenging. There had been calls for the enhancement of the use of Public-Private Partnerships (PPP) to procure infrastructure projects. The development of PPP/PFI in developing countries suggested that developing countries could benefit from this project approach. Although there had been some projects in the past which were procured through PPP, it was inevitable that there would be an increase in the use of this approach (Muleya and Zulu, 2009).

However, there were a number of factors that needed to be considered if future PPP projects were to succeed. For example, the enacted law on PPPs in Zambia was yet to be tested to find out if it would facilitate the successful delivery of projects. It was also evident that although there were different models for PPP, Zambia was yet to discover the most suitable route because there hadn't been any detailed study to specifically identify the best PPP route for Zambia and many Sub-Sahara African countries (Ibid, 2009).

### **3.2 Infrastructure needs in Zambia**

Governments provide a broad variety of services for their people, ranging from health and social programs, to defense, fire, police protection, maintaining a legal system, and the provision of physical infrastructure. The extent of the government's role varies among countries and has fluctuated historically inside each country. The main motivation of governments' intervention is constant: the need to put into place an infrastructure and legal environment where the national economy is able to produce the maximum resources (Rapheal, 2007). In Zambia, economic and population growth have strained existing infrastructure and rendered the need for improvements and new construction even more pressing.

Infrastructure includes services such as water and sewage treatment, energy, transport, information and communication technology (ICT), logistics and financial services. Many of these sectors are particularly important to the facilitation of trade and investment and maintenance of public health. Infrastructure services are generally less available in sub-Saharan Africa (SSA) than in other regions of the world (USITC, 2009). In particular, SSA lags behind many other regions in electricity consumption, paved roads, telecommunications services, air transport, and access to clean water. Financial services infrastructure is also less developed—the relatively high interest rate spread (the difference between bank lending and deposit rates) denotes a relatively high cost of borrowing. Logistics and trade costs are particularly high in SSA, in part because of transport inefficiencies, inadequate storage facilities, and underdeveloped distribution systems (Ibid, 2009).

Table 3.1 below shows the infrastructure needs in Zambia compared to some neighboring countries as per World Economic Report in 2009.

**Table 3.1** *Comparison of Zambia's infrastructure with neighboring countries*

<u>Type of infrastructure</u>	<u>Zambia</u>	<u>Botswana</u>	<u>Tanzania</u>
	No.	No.	No.
.. Quality of overall infrastructure	118	43	112
.. Quality of roads	107	44	109
.. Quality of railroad infrastructure	92	36	79
.. Quality of port infrastructure	71	60	113
.. Quality of air transport infrastructure	99	97	111
.. Quality of electricity	112	73	122

*(After World Economic Forum, 2009)*

Furthermore, literature indicates various infrastructure investment priority areas where the Government has been seeking private financing partners to deliver. Table 3.2 highlights these areas.

**Table 3.2** *Priority areas in infrastructure investment in Zambia (FNDP and Vision 2030)*

<b>Sector</b>	<b>Projects</b>
Roads	Road Sector Investment Plan (RoadSIP) with a total investment of US\$ 1.6bn over a ten year period (2004- 2013)
Energy	Rehabilitate and upgrade existing Hydro power stations and build new ones, build new Thermal power station in Maamba-Southern Province , Rural electrification
Sports Infrastructure	Rehabilitate Independence Stadium and build a new stadium in Ndola
Health	New cancer Research Centre in Lusaka, Lusaka and District hospitals, rural and per-urban clinics, Nursing schools
Housing	Both for public sector workers and for the private sector
Other Public Sector Infrastructure	Border posts, Government buildings such as those for Government Ministries, Parastatals, organizations/institutions, the Police and the Defense Forces
Water and Sewage disposal infrastructure	Rehabilitate and build new water dams, water reticulations systems including its associated sewage disposal systems in both urban and rural areas
Education	Build new public Universities and upgrade existing colleges to universities, Build and rehabilitate existing colleges, schools and staff housing

*(After Mashamba, 2009)*

Nevertheless, the Government of Zambia had succeeded in partnering with funders through different PPP models to provide infrastructure in certain critical areas of the national development. Table 3.3 highlights some of the procured infrastructure projects.



**Table 3.3** *Procured infrastructure projects*

Sector	Projects
Roads and bridges	Mwanawasa Bridge, Kafulafuta –Ndola bypass, and Katima Mulilo bridge
Commercial Buildings (Private Sector)	Barclays Bank Headquarters in Lusaka
Students Hostel Accommodation	University of Zambia, Evenly Hone College, National Institute of Public Administration (NIPA), and Copperbelt University (CBU)
Rehabilitation of Existing Hydro power stations	Itezhi Tezhi, Kafue Gorge, and Victoria Falls

(After Mashamba, 2009)

Other infrastructure investment opportunities that still needed financiers are listed in Table 3.4.

**Table 3.4** *Zambia's infrastructure related investment opportunities*

Sector/Project	Description of project
Roads	Kitwe-Chingola Dual Carriageway (52Km) & the Chingola-Solwezi Road (173Km).
Railways	Construction of the Chingola-Solwezi Railway link, rehabilitation of the TAZARA rail line currently jointly owned by Tanzania and Zambia, (may be commercialized or privatized)
Border posts through -PPP	Government is thinking of building new border posts at Nakonde, Kasumbalesa and other border posts through PPPs initiatives.
Kazungula Bridge and Boarder posts	Linking Zambia, Zimbabwe and Botswana, Feasibility study had been funded by the African Development Bank
Upgrading Lusaka and Livingstone International airports:	Airports were earmarked for improvements in readiness for the 2010 world Cup
Multi-facility Economic Zones in Lusaka and Chambeshi	The Chinese investors had already started building one in Chambeshi (Copperbelt Province) and investors were being sought for to do the Lusaka South one.
Sports (Olympic sized running track and indoor sports arena)	Both sports facilities were planned for the 2011 All Africa Games with a view to handing them over to the private sector or relevant sports bodies after the games.
Water, Solid waste and sewerage disposals	Improvement of water and sewer systems

(After Mashamba, 2009)

On some of these projects, the Government had entered into initial agreements with private partners to finance the projects. The PPP models under which these agreements have been done may differ according to the project.

The Public Partnership Unit (PPPU) in Zambia further advertised inviting private funders to partner with the Government on certain road sections (including Monze – Choma,imba – Livingstone and Chingola – Solwezi) earmarked to be converted into toll roads (Anon, 2009).

Other prospective infrastructure investment projects there were listed on the Zambia Development Agency website ([www.zda.org](http://www.zda.org)) included:

### **3.2.1 Manda Hill University**

ZIBCT Limited had been seeking for equity partners and staff attachments to assist with the running of the University. ZIBCT would contribute assets such as buildings to host the universities in Lusaka and Ndola. Land for the project had already been identified. The project required an initial capital injection of US\$ 2 million. This would be for fixed assets acquisition, latest state of the art training accessories, refurbishment and other start up costs. The University would mainly service the local market. It was however envisaged that, a substantial number of students would emerge from the rest of the Southern Africa regional market as well.

### **3.2.2 University of Zambia – ICT Skills Project**

The promoters were seeking to establish an ICT Centre of Excellence at the University of Zambia (UNZA) in Lusaka. At the time, the country lacked a modern training institution that offered high level ICT programmes. The Centre would have adequate internal market within the University and the general public.

### **3.2.3 Victoria University of Technology (VUT)**

The promoters wished to establish a technology university in Livingstone. VUT had acquired 100 hectares of land in Livingstone for the development of a campus. This was a green field project and the promoters had commenced the rehabilitation of identified buildings to host

the university. They were seeking for partners to build a university which would be a centre of education excellence.

### **3.2.4 Luanshya Institute of Technology and Education**

Under this project, government would partner with a private investor to bring in capital in terms of new and modern equipment, management and other facilities. This project would be an amalgamation of three colleges which were operating independently but located in one complex. This project had an estimated annual enrolment potential of over 4,000 students which would continue to grow with the expansion demand for more technical and vocational training.

### **3.2.5 National Institute of Science and Technology**

This project was a response to the government investment programmes in the development of multi-facility economic zones. The first of these facilities was being established in Chambeshi and the Ministry of Science Technology and Vocational Training was to develop this institute to provide high level skills for industries and the mining sector in general.

This project was at feasibility level and a private partner would work with government to develop the project as a joint venture. The programmes that were expected to be offered by this institution would all be at diploma level to include the following fields: Chemical engineering, Metallurgy, Instrumentation, Process engineering, Industrial electronics, Manufacturing and Product design and modeling.

### **3.2.6 Institute of Arts and Media**

A private partner was required to partner with Evelyn Hone College to develop the department and be able to offer courses such as: Music production, Film and digital photography, Painting, Design and fashion; and Graphic design and publishing.

This project was to involve the development and expansions of programmes at Evelyn Hone College of Applied Arts and Commerce in Lusaka. The college at the time was the only one offering courses in music, media and art. The total enrolment in these programmes in 2007

was 350. These courses, however, had great opportunity to contribute to the development of the music and film industry in Zambia that had shown some growth in past years.

### **3.2.7 Gemstone Processing and Lapidary Training Centre**

The government established a new institution in Ndola focusing on development of skills for production in the gemstone industry particularly for small scale miners. The institution focuses on courses in gemstone cutting, sorting, and polishing. The plan was to expand the course portfolio to include jewelry and bead making, though the institution was constrained by lack of qualified staff and appropriate equipment.

A partnership with a private company to develop this institution was to enable government to provide critical skills to an industry that had great potential to contribute to economic development of the country by improving the efficiency of small scale miners.

### **3.2.8 Njanji Commuter Services Set For Concession**

Zambia Development Agency was inviting qualified operators to undertake the concession of the Njanji Commuter Services (NCS) assets, mainly the railway line covering a distance of 13.5 kilometers. The Concession was intended for a period of 15 years renewable based on performance, and would be expected to manage the infrastructure and rail operations. The Concessionaire would also be responsible for management and maintenance of all assets and be required to maintain the immovable assets and return it to the State at the end of the concession period in as good if not better condition at the end of the concession.

Government would ensure that access was granted to run the commuter services along the original NCS mainline but would not guarantee access to the Zambia Railways Mainline which was operating under a different concession. However, the Concessionaire would negotiate with the relevant stakeholders the right to access this line to cover Ngwerere to Chilanga which was yet another densely populated area covering a distance of approximately 25km from the North of Lusaka to the South. Technical Proposals would need to address possible remodeling or rehabilitation investment methods, such as Build-Operate-Transfer (BOT) and variants of BOT schemes.

### **3.3 Infrastructure reform and development in Zambia**

Zambia like many Sub-Sahara countries invested significant amounts of money immediately after their independence in 1964 to support economic development. However, the level of investment had not been maintained. Several factors including the economic downturn during the 1970-1990s due to the drop in copper prices and the policy initiatives during the period ranging from 1964 to 1991, resulted in limited resources to improve infrastructure. This was compounded by the increase in population which meant that the need arose to upgrade the capacity of infrastructure. The World Bank (2002) noted that one of the contributing factors for the infrastructure gap in Zambia was the over reliance on copper, being a main product sustaining economic growth. They noted that following the country's independence, a number of cities were developed quickly with associated infrastructure. However, due to the slump in copper prices, increase in urban migration, the developed infrastructure soon became inadequate, dilapidated and could not be maintained due to its high costs.

An example of such infrastructure which had become incapable to cope with increased demand for use and quality is the main satellite telecommunication facility at Mwembeshi. The facility had been experiencing congestion of which there had been calls for it to be upgraded if consumer confidence was to be restored (CIO, 2008). Other areas that had deficits included public markets, hospitals, Universities, accommodation for University and college students, police offices and housing units, sports stadiums and related facilities. The development of infrastructure had generally been the Zambian government's responsibility and much of it had been donor funded. The World Bank, IMF and other bilateral and multi-lateral donors had made significant contribution to infrastructure development in Zambia. The lack of resources was acknowledged by the Zambian government and had therefore challenged the private sector to participate in infrastructure development (Anon, 2009).

After Zambia attained independence until the mid-1970s, the Government was responsible for administering most of the economic affairs of the country. Further, Government was responsible for the provision of infrastructure and related services. During this period, it was possible to sustain economic growth mainly due to the favorable trends in the global economy. When prices of copper declined in the early 1970s, Zambia's export earnings

reduced. This resulted in macroeconomic instability resulting from huge balance of payments deficits (ZDA, 2010).

In the early 1990s, the Zambian Government initiated economic reforms leading to the liberalization and a market driven economy. Privatization of Government owned enterprises was one of the main actions taken in the process of reforming the economy. Despite the reforms, Government still remained responsible for provision of infrastructure and related services (Ibid).

According to Mukela (2009), the Government of Zambia recognized the need to provide infrastructure and services through public-private partnerships (PPPs) in 2004. Though some forms of PPPs had been in existence, there was no framework for their implementation. As such, a number of challenges mainly relating to contractual obligations had been experienced in the execution of PPP projects. PPPs provided opportunities for the Government and the private sector to share and manage risk appropriately. This option provided a more appropriate compromise that allowed the Government to maintain statutory and regulatory oversight on the nation's assets, whilst allowing the private sector to provide resources and management. Since then, the Government had actively engaged the private sector in dialogue on matters affecting the nation's economic development (Ibid, 2007).

The importance of infrastructure investment has been discussed widely in literature that it influences economic growth. Fedderke and Bogetic (2006) suggest that the influence of infrastructure is both direct, through capital accumulation and indirect through total factor productivity gains. For example, improvement in road networks increases accessibility and improves communication which would therefore facilitate growth by promoting private investments in an area. Grimsey and Lewis (2006) distinguished the types of infrastructure projects including; energy, transport, water, telecommunication and social infrastructure projects like schools, hospitals and police centers. These infrastructure projects are at most attractive because they are revenue dependant. However, social projects would depend on the arrangement between the public body and the private enterprise.

Many countries in Sub-Sahara Africa (SSA) have an infrastructure gap. In order to narrow this gap most SSA countries would need to commit to 9%-13% of their GDP's for at least the next 8-10 years (Estache 2005; Hammami et al 2006). The lack of adequate and quality infrastructure is evident in many Sub-Sahara African countries, including Zambia. Estache (2005) noted that the rate of access to quality infrastructure in developing countries remains relatively low when compared to other developed and emerging countries.

USITC (2009) describes the following as benefits of improved infrastructure:

- i. Provided development benefits to countries by reducing costs while increasing output and productivity of individual producers and businesses, rendering their goods and services more competitive in international markets; and improving living conditions and opportunities, including poorer segments of Sub-Sahara Africa (SSA)'s population. Relatively better infrastructure affects production and trade by reducing production costs. For example, power generators, electricity transmission and distribution systems, and road networks are infrastructure stocks that provide services (electricity and transportation) to producers, similar to factors of production such as labor and capital.
- ii. Can also lead to increased production and economic growth through economies of scale, better inventory management, and the use of higher quality and more sophisticated equipment and processes.
- iii. Can also contribute to reducing poverty and inequality in most countries because access to basic infrastructure services—roads, electricity, clean water, and sewage treatment and disposal systems—is essential to improving quality of life. Infrastructure in most developing regions, including SSA, is characterized by low and unequal access for the poor. Improved infrastructure can reduce this inequality if it also enhances the living standards of the poorest segments of society. Moreover, better infrastructure often improves access to healthcare and education, thereby enhancing individuals' employment and economic opportunities.

The need for initiatives to increase infrastructure investment to support economic growth in Zambia, COMESA and SADC region is acknowledged by the Governments. For example the Zambian government has called on SADC member countries to re-double their trans-

boundary infrastructure investment efforts in order to support regional economic growth and integration (Times of Zambia, 2008).

### **3.5 Development of a framework for PPP implementation in Zambia**

Before implementing the PPP Policy and further the ACT, there was a process of consultation. Any institutional process in Zambia involves the establishment of a policy followed by the legal framework in consultation with the relevant stakeholders. Being a relatively new concept to be institutionalized, the PPP process required a broad consultative process and a study of best practices in the region and beyond. It was also necessary to examine the Zambian private sector's capacity to participate in PPP projects (Mukela, 2007).

Mukela (2007) noted that the study of best practices in the region and internationally particularly revealed a number of issues that needed to be considered for application in Zambia. Whereas the economies in the countries visited were distinct from each other, a common thread could be traced in the fact that there had to be a sound framework for the implementation of PPP projects. It was also observed that the scope and extent to which PPPs are implemented in various countries is dependent on the respective economic framework of a nation. For instance, some countries such as India allow for unsolicited bids to be undertaken under specific conditions and procedures, while it is not an option in other countries like South Africa.

Mukela (2009) further discusses that some countries apply a number of statutory instruments in implementing PPPs and others have one specific act that governs the implementation of PPP projects. This led to a review of the Zambian legislation that would have an impact on PPPs, in order to ascertain the necessity of establishing new legislation or strengthening the existing legislation. This was important in that the study revealed any existing conflicts in laws relating to PPPs; areas that required to be enhanced by additional provisions; it also highlighted the existing institutional arrangements and options for PPP administration.

Experiences of other countries with regard to PPPs were worthwhile, yet did not fully address some of the challenges unique to the Zambian environment. One of the major challenges



Zambia faces today is the limited capacity of the local private sector to invest in large scale infrastructure projects and services. Whereas PPPs would attract foreign investment, it was also important to create opportunities for the local private sector. It was therefore necessary to ascertain the capacity of the private sector in Zambia to participate in the provision of infrastructure. The results of this study showed that the critical elements required to enhance local capacity were access to finance and deliberate policy to strengthen SMEs (Enfin and Vention Africa, 2006).

In addition, there was limited technical capacity in both the public and private sectors to administer PPP projects in Zambia. The complex and long term nature of most PPP projects demanded skills and understanding beyond that of traditional contract management or administration. Experiences in other countries showed that despite the advancements in PPP implementation, there was substantial reliance on transaction advisors on most projects due to the range of expertise required in PPP transactions (Ibid, 2006).

The PPP policy formulation was therefore influenced by the outcomes of the study of best practices and the assessment of local capacity to invest in infrastructure and related services. This led to a policy that was generic in nature, which could be adapted to most PPP options (Ibid, 2006).

Further, PPP policy guidelines regarding implementation included periodic review of the policy to allow for consistency and modification in accordance with the development process. This was an important aspect in view of the dynamic nature of the economy and the extended durations of PPP projects. The policy also accounted for the need to build expertise in both the public and private sectors to administer and manage PPP projects. The importance of a sound policy, legal and institutional framework for PPPs cannot be overstated as it is the foundation of successful partnerships and a profitable environment for business undertakings. Some of the reasons for this include:

- i. It fosters confidence for the private sector to subscribe to PPP arrangements;
- ii. It provides a stable environment for the private sector to commit to long term projects;
- iii. Clarifies contractual obligations and provides recourse in case of disputes or changes;

- iv. Defines the criteria for partnerships;
- v. Enhances competitiveness and transparency;

The above factors may not be standard for every country; however, they help shape, enhance and maintain good business practices (NCC, 2008).

### **3.6 The potential role of Public Private Partnerships in Zambia**

The use of PPPs to deliver public sector projects has been embraced throughout the world with the United Kingdom being one of the forerunners in its use. The genesis of PPP in UK was under the PFI scheme (Turolla 2004), which was used to boost public sector investment programme. Hammani (2006) refers to PPP as a variety of financing and delivering approaches that create long-term relationships between the private sector and the public sector, while the UNECE (2008) describes PPP as a tool that is aimed at financing, designing, implementing and operating public sector facilities and services by the private sector.

On the 26<sup>th</sup> of August 2009, the Government of Zambia enacted a law (Act No.14 of 2009) to promote Public Private Partnerships. The act's guideline is to promote and facilitate the implementation of privately financed infrastructure projects and effective delivery of social services (The Laws of Zambia, PPP Act, 2009).

The benefits of PPP have been widely discussed in literature. Key to PPP is that it is used as a mode for infrastructure delivery as the public sector can now consider projects which otherwise would have been unaffordable (Hammani, 2006). The approach is therefore widely seen as a promising avenue for infrastructure development in developing countries like Zambia, especially that it allows the public sector to spread the costs of the project as they only pay for infrastructure provisions as the services is provided (Allard and Trabant, 2007). With reduced public sector capacity to provide necessary infrastructure, due to funding constraints, most developing countries are looking to the private sector to help deliver necessary infrastructure. Allard & Trabant (2007) cites a number of benefits of PPP including the following; higher quality, cost and on time delivery, risk transfer, private sector management experience of otherwise complex projects and private sector innovation in

planning for maintenance. Bracey (2006) note that the use of PPP allows the public sector to transfer risks to the private sector. However they note that the allocation of risks should be in such a way that the public sector and the private sector benefit from the project. Risk on PPP projects in developing countries is therefore a major determining factor for private sector involvement, especially foreign private company involvement. Although the use of PPP has been generating interest in developing countries, its use worldwide seem to have declined as investors have discovered that the risks associated with the projects are in many times costly (Bracey and Moldovan 2006).

Table 3.5 describes a public private partnership support matrix which summarizes the many benefit factors that make PPP a better option as a financing method.

Furthermore, table 3.6 shows the use of PPP in the SADC region with South Africa having the largest number of PPP projects since 1990. However Zambia has only had 6 PPP projects since 1990.

This shows that PPPs in Zambia have a great potential to attract a lot of private sector investment, since most areas of development still remain unexplored. With the enactment of the PPP bill in parliament, a gateway has been opened up for the private sector to consider partnering with the Government.

**Table 3.5 PPP Support Matrix**

<b>PPP SUPPORT FACTOR OR ADVANTAGE</b>	<b>DETAILS</b>	<b>AUTHOR</b>
Specialised Contracts	There are many contracts as seen in the project financing structure allowing firms to undertake specialized works and risks.	Quiggin (1998)
Flexible mechanism	PPPs provide an opportunity for the host government to own infrastructure after the concession period.	Guistain and Michel (995)
More efficient than government managed projects	Although governments borrow at lower costs to fund projects, management is better and more efficient in private sector.	Klein and Roger (1995)
Significant reduction of pressure on public funds	Project finance international reported a 100% increase in infrastructure projects in Asia and Australasia after the implementation of PPPs.	Merna and Owen (1998)
Risk transference from the public to private sector	Risk transference leaves the public sector with minimal and manageable investment risks.	Merna and Dubley (1998)
Variety and flexibility of financial instruments	Sources of finance for PPPs range from debt, equity, loans and guarantees. Some combinations of these can be swaped in order to maintain a healthy cash flow curve.	Merna and Dubley (1998)

*(After Muleya and Zulu, 2009)*

**Table 3.6** *Comparative data: PPP in SADC countries*

Country	Gross National Income (US \$ million)	No. of PPP projects	Total investment (US \$ million)
South Africa	5390	32	25341
Tanzania	350	21	2115
Mozambique	340	15	2241
Mauritius	5450	11	549
Madagascar	280	9	216
Congo Dem Rep.	130	7	915
Malawi	170	6	133
Zambia	630	6	944
Zimbabwe	-	5	841
Namibia	3230	5	104
Angola	180	5	834
Lesotho	1030	3	114
Seychelles	8650	3	94
Botswana	590	2	247
Swaziland	2430	1	53

*(After World Bank, 2009)*

### **3.7 Key aspects in PPPs: A challenge for Zambia**

While the use of PPP provided potential for a leap in infrastructure development in Zambia, there are a number of challenges that needed to be addressed carefully. The challenges included legal and regulatory constraints, risk management, procurement, capacity building and project financing. Fischer et al (2006) outlined a number of examples that were critical for successful PPP results and these included; suitable legal frameworks, procurement process, coordinating and supportive authority and marketability and affordability. They advocated that the use of a task force to push for legislation changes, advise on policy issues and promote transparency and accountability was necessary for the development of effective PPP procurement in a country. Table 3.7 summarizes some of the factors that are relevant to PPPs.

**Table 3.7** *Factors influencing use of PPP*

Factor	
Legal & Regulatory governance framework	Suitable legal framework
	Coordinated & supportive authority
	Institutional quality (e.g. less Corruption)
	Regulatory instability
	Appropriate procurement processes
Risk Management & Procurement	Previous experience of PPP
	Risk Management
	Marketability & affordability
	Market should be large enough to allow for cost recovery
Economics & Finance	Stable macroeconomics
	Aggregate demand is stable
	Cost of capital
	Availability of long term credit
	Inflation-price stability
	Attractive interest rates
	Availability of financial institutions

*(After World Bank, 2009)*

The use of PPP has potential benefits as it provides an opportunity for the public sector to consider projects which would otherwise have been too costly to procure. PPPs also accelerate development and benefit communities (Chipanta, 2009). The Zambian government's initiative to encourage private participation in infrastructure development was in the right direction. However, consideration needed to be given to many issues for it to be successful and realise the benefits of PPP (Muleya and Zulu, 2009).

Muleya and Zulu (2009) argued that the key factors that influence the use of PPPs, i.e. legal and regulatory governance, risk management, procurement, economics and finance should be clearly addressed. On the legal and regulatory governance, a recommendation was that the institutional capacity for PPP be strengthened by establishing a 'PPP Watchdog' separate from the existing

public procurement agencies to provide a platform for advice and best practice guidance on PPP.

The proposed management and monitoring of PPP projects under a public institution as stipulated in the Zambian PPP policy was likely to fail to deliver the intended results. The unit under the public institute would not have the required capacity to monitor and analyze risks which include financial, technical, revenue, engineering, political and innovation. The management of risk and the general procurement process must be addressed further for possible revision. As discussed above, PPPs could be used to offload all risks to the private sector; however this would come at a premium. One of the challenges for private investors would be the guarantee of revenue risks to recoup back the investment. There was therefore a need to devise appropriate PPP finance structures to ensure that revenue risks were reduced while ensuring user affordability of possible charges (Ibid, 2009).

Detailed customised structures, financial instruments, contracts and special project vehicles (Promoters) for each PPP must be appropriately worked out because each project is unique from the other. There was great need to continuously improve the PPP policy document, and research further on how the PPP could be best introduced and implemented in Zambia in order to produce the best results which would richly benefit both the public and the private sectors, a win – win result (Ibid, 2009).

Kazunga (2006) further describes the following as possible challenges in Public Private Partnerships:

- i. Underlying legal, political and institutional obstacles to forming effective Public-Private relationships.
- ii. Absence of experience on partnerships between public and private since it was generally felt the state will do everything then later it was believed the free market economy will solve the problems but not the two working together.
- iii. Mistrust and lack of understanding of each other's interests and needs between the public and private sectors.

- iv. Most of the local leadership is sceptical about this idea as it is considered western. It is considered that it will fail like other programmes that were introduced. It is generally felt that these are experimental. This is due to the many negative experiences that have been experienced.
- v. Most of the elected leaders are scared that they will lose their powers to the private firms.
- vi. Developing of capacity in the various technical aspects of PPP design and implementation at the local government level is lacking.
- vii. Developing of capacity in tendering procedures, tariff setting contract compliance guidelines for companies who will want to partner with the local government is lacking.

It is clear therefore that for PPPs to be successful, the issues identified above should be adequately addressed. While the list is not exhaustive, it reflects some of the key lessons learnt in other countries. Zambia needs to address them if the application of PPP is to be successful (Muleya and Zulu, 2009).

It is important to note that Government on its own may not achieve its intended goals without the involvement of its constituents. The private sector, on the other hand, may not thrive or grow without the government providing advantages for wealth creation. Society, in turn, benefits from the successful synergy between the public and private sectors (Mukela, 2007).

Thus, in establishing a framework for PPPs in Zambia, the Government was creating a platform for business to be undertaken to a new level and with broadened options. As business partners, the public and private sector become significant to each other's success and sustainability (Ibid, 2007). A content analysis has been presented in Table 3.8.



**Table 3.8** *Content analysis of reviewed literature*

S/N	Name of Author (s)	Date of Publication	Title of Publication	Lessons learnt	Critics on the methodology/ content
1.	Allard G and Trabant	2007	Public-Private Partnerships in Spain: Lessons and Opportunities	The paper describes the scenario of PPP in Spain and have the country has benefited from the reform process.	The publication was concise with a clear methodology.
2.	Bracey, N. & Moldovan, S.,	2006	Public-Private- Partnerships: Risks to the Public and Private Sector	The document describes the various risks that are coherent in the public and private sector entities.	The publication was provide a cut-across scenario with good case studies.
3.	Castalia Strategic Advisors	2005	Experience with Private Participation Initiatives in Sub-Saharan African Infrastructure. What are the Lessons for Future Policy?	The paper analyses different economies and how investment faces challenges. It brings out the advantages of PPP as a financing model in various investments.	The write-up is good in terms of content except it does not clearly show the methodology.
4.	Estache, A	2005	What do we know about Sub-Saharan Africa's Infrastructure and the Impact of its 1990s reforms?	Explains the impact of 1990 policies on reform on the SSA countries	The paper presents a scholarly methodology.
7.	Fedderke, J & Bogetic, Z.	2006	Infrastructure and Growth in South Africa: Direct and Indirect Productivity Impacts of 19 Infrastructure Measures	Describes the effect of the productivity measures	Good methodological approach
8.	Fischer, K., Jungbecker, A. & Alfen, H.	2006	The emergence of PPP Task Forces and their influence on project delivery in Germany	It explains how the task Forces implemented major reforms which led to the strengthening of the PPP policies	The contents are concise with a clear methodology

<b>S/N</b>	<b>Name of Author (s)</b>	<b>Date of Publication</b>	<b>Title of Publication</b>	<b>Lessons learnt</b>	<b>Critics on the methodology/ content</b>
9.	Grimsey D and Lewis M	2002	Evaluating the risks of PPP for Infrastructure	Describes the various risks coherent in PPPs	The methodology is a good presentation
10.	Guislain, P. and Michel, K.	1995	Concessions – The way to Privatised Infrastructure Sector Monopolies	Defines concessions with the different approaches.	The paper has a clear and concise description.
11.	Hammami,H., Ruhashyankiko, J. & Yehoue, E.	2006	Determinants of Public-Private Partnerships in Infrastructure	Describes the challenges found in PPPs	The contents are concise with a clear methodology
12.	Kazunga T.	2006	Resource mobilization for service provision in Zambia: Proposal for Public Private Partnership	The paper focuses on ways to mobilize resources for service provision using PPP in accessing shelter and urban services in Zambia. Using case studies, it describes PPP, possible challenges, and expected outcomes to provide resources to the public sector.	The paper does not describe cases where PPP have worked in Zambia. It does not also recommend how the resources could be mobilized for service provision through PPP.
13.	Klein,M. and Roger, N	1995	The Potential in Infrastructure Privatisation	Describes the potential factors found in privatization of infrastructure.	The paper does not provide any methodology to show a cross-section view on PPP issues.
14.	Mashamba S.	2009	Developments in the Zambian Construction Industry	Explains the current scenario of infrastructure needs in Zambia	The presentation is good though it does not state the sources of information for certain information
14.	Merna, T and Dubley R	1998	Financial Engineering in the Procurement of Projects	Explains the financial benefits and challenges found in the procurement of PPP projects	The contents are concise with a clear methodology

S/N	Name of Author (s)	Date of Publication	Title of Publication	Lessons learnt	Critics on the methodology/ content
15.	Merna, T and Njiru,	2002	Financing infrastructure Projects	Describes PPP as a financing model	The paper does not show how the policy was developed.
16.	Merna, T and Owen,G..	1998	Understanding the Private Finance Initiative	The paper brings out principles and fundamentals of PPPs key to a successful partnership; and how both parties could be satisfied with what the other has to offer.	Provides a good articulation of PPP fundamentals with a good selection of case studies
17.	Merna, T and Smith N.J	1996	Projects Procured by Privately Financed Concession Contracts	Describes the PPP Act and how the PPP Unit will acquire PPP projects.	The contents are concise with a clear methodology
18.	Mukela M	2007	The significant other: A case of Public Private Partnership in Zambia. Lessons learned in the infrastructure reform process	Provides a concise description of the reformation process and how the PPP Act was finalized.	The paper provides insights of issues critical to the statutory instrument bow in place.
19.	Muleya F. and Zulu S	2009	Delivering Infrastructure Development using PPP/PFI: A Challenge for Zambia	Describes briefly the reformation process in Zambia, PPP models and the potential of PPP with the present and foreseen challenges.	The paper is a good and concise compilation of the issues needed to consider in PPP formulation
20.	Public Private Partnership Act	2009	Public Private Partnership Act 2009	Describes the provision of the act	The provisions stated in the act do not concisely explain how the models would be used and the limitations
21.	Quiggin J	1998	Private Infrastructure Options: BOOTs, BOTs	Defines the various options available when considering	The paper presents practical examples

<b>S/N</b>	<b>Name of Author (s)</b>	<b>Date of Publication</b>	<b>Title of Publication</b>	<b>Lessons learnt</b>	<b>Critics on the methodology/ content</b>
			and BOOs,.	PPP in the market.	of PPP models. It takes care of the various economies and how to overcome the challenges.
22.	Raphael V	2007	Public-Private Partnerships: Can the United States learn from the French experience to address its highway funding needs?	The paper explains PPP as an old model of project financing which has undergone a lot of adjustments to meet the different and ever-changing economic environment. It justifies that USA can learn something from the experiences of the French PPP approach.	The paper provides a concise research with a clear methodology on PPP issues. The case studies are well elaborated.
23.	The National Council for Construction (NCC).	2006	Draft Policy Document on Public-Private Partnerships for Zambia	Gives the draft policy the PPP with descriptions of how the PPPs would be beneficial to the nation. It also states the various models used in PPP agreements	The report does not describe the different scenarios where the various models in PPP would be utilized.
24.	The World Bank	2002	Upgrading Of Low Income Settlements Country Assessment Report: Zambia,	A report on the upgrading of low income settlements in Zambia. It describes the scenario of certain case studies.	The report is precise and gives a good analysis of the various case studies used.
26.	United Nations Economic Commission for Europe- UNECE	2008	Guidebook on Promoting Good Governance in Public-Private Partnerships	The publication gives a detailed guideline on issues to consider before going into PPP agreements.	The publication is good though the discussion is too brief

<b>S/N</b>	<b>Name of Author (s)</b>	<b>Date of Publication</b>	<b>Title of Publication</b>	<b>Lessons learnt</b>	<b>Critics on the methodology/ content</b>
27.	USITC	2009	Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report	The paper analyses the various challenges in investment that affect Sub-Saharan Africa.	The paper is a concise and well prepared presentation

### **3.6 Summary**

This chapter presented the literature reviewed from local sources. Highlights on the development of the PPP policy, infrastructure needs and challenges facing the delivery of public sector projects were presented. The chapter further presented an explanation of effective the existing PPP model could be made if principles learnt from other countries were applied. The next chapter discusses the research methodology.

## **CHAPTER 4: RESEARCH METHODOLOGY**

### **4.1 Introduction**

The previous two chapters presented the literature reviewed on the topic. This chapter examines the overall approach to the research process by considering the various research methods available. The research methods are then evaluated with regards to their strengths and limitations. Finally, the methods that are appropriate in achieving the objectives of research are selected.

### **4.2 Definition**

There is general agreement that research is a scientific and systematic search for pertinent information on a specific topic (Kothari and Garg, 2014). Its purpose is to review and synthesize existing knowledge, to investigate existing situations or problems, to provide solutions to a problem, to explore and analyse more general issues, to construct or create new procedures or systems, to explain a new phenomenon or to generate new knowledge.

Research can be further classified according to research logic and research outcome. Research logic is either deductive or inductive, whether the research proceeds from the general to specific or vice versa. Research is employed for obtaining knowledge, whether the research contributes to the base of knowledge or resolves a particular problem (Ibid, 2014; Sekaran, 1992).

### **4.3 Research paradigm**

A paradigm provides a conceptual framework for seeing and making sense of the social world. According to Morgan (2007), to be located in a particular paradigm is to view the world in a particular way. A paradigm has long been termed a "world view" (Patton, 1990). However, it was Kuhn (1970) who introduced the term as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners", and who suspected that "something like a paradigm is a prerequisite to perception itself". In the postscript to his second edition, Kuhn (1970) provides a useful definition; "it stands for the entire constellation of beliefs, values and techniques, shared by the members of a community". The

paradigm framework is made up of POEM, P for Philosophy, O for Ontology, E for Epistemology, and M for Methodology.

The significance of paradigms is that they shape how we perceive the world and are reinforced by those around us, the community of practitioners. Within research, the beliefs a researcher holds will reflect in the way their study is designed, how data is both collected and analysed, and how research results are presented. For researchers, it is important to recognise their paradigms, as it allows them to identify their role in the research process, determine the course of any study and distinguish other perspectives (Byman, 2004; Kuhn, 1970). There are currently three major research paradigms including quantitative, qualitative, and mixed research (Tashakkori and Teddlie, 2003).

#### **4.3.1 Quantitative Research Paradigm**

Quantitative research is based on the quantitative measurements of some characteristics (Kothari and Garg, 2014). It is applicable to phenomena that can be expressed in terms of quantities. Other terms used for qualitative research include functionalist, objectivist or positivist. The basic building blocks of quantitative research are variables. Variables, being something that takes on different values or categories, are the opposite of constants, which is something that cannot vary such as a single value or category of a variable. The quantitative approach is seen as objective, that is relating to phenomenon or conditions independent of individual thought and perceptible to all observers, and relying, "heavily on statistics and figures" (Lee, 1992; Bryman, 2004).

Morgan (2007) discusses that the basic beliefs of a positivist or quantitative researcher leads them to perceive the world as external and objective, and science as value free. Reality is seen as one and therefore by dividing and studying its parts, the whole can be understood. Therefore, in their general approach to research design, the quantitative researcher seeks to deduce cause and effect relationships to predict patterns of behaviour. Therefore, the research purpose is likely to be causal or predictive rather than exploratory. The quantitative researcher then develops theory and uses this to explore the world. This theoretical framework identifies key

variables and their relationships and associations. It allows initial design clarity but the result may not necessarily contribute to existing knowledge.

The research sample size in a quantitative approach would be reasonably large, a sub-set of a larger population and random sample with the same characteristics as that population. Typically, a quantitative researcher will use secondary data, survey techniques and classic experiments when collecting data, whereas an interpretivist will focus on fieldwork to facilitate the emergence of knowledge (Ellen, 2004). Researcher involvement in this stage of the research process is low with the researcher acting as an observer.

The stages in data analysis and interpretation are completed after data collection. Statistical measures of association and the development of measurement models are significant at this stage and the language used becomes the language of variables (Morgan, 2007). Quantitative data analysis and interpretation is primarily deductive, a matter of proving or disproving the hypothesis or an assertion developed from a general statement. In any causal or predictive study, whether the cause and effect relationship has been demonstrated or not, the researcher has done their duty (Ellen, 2004). Therefore, when reporting research results, the findings are discussed, in a recognised format, as to the extent to which the data collected either confirms or disproves a research question.

The major types of quantitative research include experimental and non-experimental studies.

#### **i) Experimental research**

The purpose of experimental research is to study cause and effect relationships. Its defining characteristic is active manipulation of an independent variable, i.e., it is only in experimental research that “manipulation” is present. Also, random assignment, which creates "equivalent" groups, is used in the strongest experimental research designs.

#### **ii) Non-experimental research**

In non-experimental research, there is no manipulation of the independent variable. There also is no random assignment of participants to groups. If one ever sees a relationship between two



variables in non-experimental research, they cannot jump to a conclusion of cause and effect because there will be too many other alternative explanations for the relationship. The two distinctions of non-experimental research are of causal-comparative and correlational research.

#### **4.3.2 Qualitative Research Paradigm**

Qualitative research relies on the collection of qualitative data. Pure qualitative research will follow all of the paradigm characteristics. The other terms used are interpretivist or subjectivist. Interpretivist qualitative research is primarily exploratory and descriptive in purpose and is designed to discover what can be learned about the area of interest. The interpretivist researcher views the world as a socio-psychological construct where there are multiple realities forming an interconnected whole (Morgan, 2007; Lee, 1992).

The qualitative approach is seen as subjective, relating to experience or knowledge as conditioned by personal mental characteristics or states, and preferring language and description. Van (1983) refers to the qualitative mode as an attempt to reduce distance between context and action through "trade in linguistic symbols". This approach involves the examination of perceptions in order to gain an understanding of social and human activities.

According to Ellen (2004), functionalism and interpretivism may differ in the extent to which they define an analytical framework prior to entering the organization to be studied. This means that interpretivist research design evolves over time as features emerge from the research that the initial design did not cover. The design steps essential remain the same, however, they are not as rigid as the quantitative approach. The researcher is guided by their research and not the framework.

The qualitative approach to research strategy is characterised by lower sample numbers, than in the quantitative, and participants are selected to expand variability and represent the natural population. Normally, forms of non-probability sampling such as accidental or purposive are used (Ellen, 2004). This approach is often time consuming as patterns slowly emerge. Also what is true in one context may not be true for another; therefore, data may need to be gathered in a variety of contexts, which takes both time and effort (Tucker et al, 1995). The interpretivist also

explores first and then develops theory thus allowing deeper explanations and insights. However, some uncertainty exists as it is possible that nothing of value may emerge.

High researcher involvement in data collection characterises this approach. The researcher is an active participant often immersing themselves in a setting, becoming part of the group under study in order to understand meaning and significance. Typical techniques include participant observation, in depth interviews, group interviews and documentation collection and analysis with an emphasis on fieldwork. The data, after collection, has to be prepared for analysis (Kothari and Garg, 2014). In contrast to the causal mode of functionalist analysis, interpretive analysis is associative. For the interpretivist what is meaningful emerges from the data, therefore the process is inductive. In presenting results, it is the narrative of the participants that speaks.

There are five major types of qualitative or interpretivist research: phenomenology, ethnography, case study, grounded theory and historical research. All of the approaches are similar in that they are qualitative approaches. Each approach, however, has some distinct characteristics and tends to have its own roots and following.

According to Kothari and Garg (2014), the definitions of the different types of qualitative research include:

- i. Phenomenology – a form of qualitative research in which the researcher attempts to understand how one or more individuals experience a phenomenon. For example, twenty widows might be interviewed and asked to describe their experiences on the deaths of their husbands;
- ii. Ethnography – is the form of qualitative research that focuses on describing the culture of a group of people. A culture is the shared attitudes, values, norms, practices, language, and material things of a group of people (Bryman, 2004);
- iii. Case study – is a form of qualitative research that is focused on providing a detailed account of one or more cases. An example, is a study on a class of students that was given a new curriculum for technology use (Ellen, 2004);

- iv. Grounded theory – is a qualitative approach to generating and developing a theory from data that the researcher collects. For example, data could be collected from parents who have pulled their children out of public schools and developed into a theory to explain how and why this phenomenon occurs, ultimately establishing a theory of school pull-out; and
- v. Historical – research about events that occurred in the past. An example is a study on the use of corporal punishment in schools in the 19th century (Morgan, 2007).

### 4.3.3 Mixed research paradigm

Mixed research is a general type of study, in which quantitative and qualitative methods, techniques, or other paradigm characteristics are mixed in one overall study. The two major types of mixed research are: **mixed method** versus **mixed model**.

- i) Mixed method research – is a study in which the researcher uses the qualitative research paradigm for one phase of an investigation and the quantitative research paradigm for another phase of the research. For example, a researcher might conduct an experiment, which is quantitative in nature, and afterwards interview participants, which is qualitative, to see how they viewed the experiment and also if they agreed with the results. Mixed method research is like conducting two mini-studies within one overall research project (Kothari and Garg, 2014).
- ii) Mixed model research – is a study in which the researcher mixes both qualitative and quantitative research approaches within a stage of the study or across two of the stages of the research process. For example, a researcher might conduct a survey and use a questionnaire that is composed of multiple closed-ended or quantitative type items as well as several open-ended or qualitative type items. Furthermore, a researcher might collect qualitative data but then try to quantify the data (Ibid, 2014).

#### **4.3.3.1 Advantages of mixed research**

Tashakkori and Teddlie (2003) believe that mixed research in education will help qualitative and quantitative researchers to get along better and, more importantly, promote the conduct of excellency due to the following reasons:

- i. Since the major goal is to follow the fundamental principle of mixed research, the investigator should mix quantitative and qualitative methods, procedures and paradigm characteristics in a way that the resulting mixture or combination has complementary strengths and non-overlapping weaknesses;
- ii. When different approaches are used to focus on the same phenomenon and they provide the same result, there is "collaboration" which means there could be superior evidence for the result; and
- iii. To complement one set of results with another, to expand a set of results, or to discover something that would have been missed if only a quantitative or a qualitative approach had been used.

Some researchers like to conduct mixed research in a single study. However, it is interesting to note that virtually all research literature would be mixed at the aggregate level, even if no single researcher uses mixed research. That is because there will usually be some quantitative and some qualitative studies in research literature (Morgan, 2007).

#### **4.4 Research methods**

There are various methods of research available in use today. Different research types also have different data gathering methods. Data collection techniques can be broadly classified as primary and secondary.

##### **4.4.1 Primary technique**

According to Nkhata (1997), this technique is used in data collection. The primary data are those which are collected afresh and for the first time, and are original in character (Kothari and

Garg, 2014). This technique includes methods such as observations, interviews and administration of questionnaires. Focus Group Discussion is also one of the primary techniques of data collection.

#### **i. Observation**

This method of data collection is commonly used in studies relating to behavioural sciences. According to Kothari and Garg (2014), observation becomes a scientific tool and the method of data collection for a researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Once the researcher joins the organisation, the aim would be to learn all their behaviour and habits. This involves total immersion in the group being studied (Achola and Bless, 1988). For example, within the construction industry, the observer would join an organisation with the aim of studying the construction processes.

#### **ii. Case study**

Case studies are detailed and thorough investigation of real life situations. They provide a way of organising data and looking at the objects to be studied as a whole. All aspects of the case study are considered, which means that the development over time of the event constitutes an important dimension. Thus a case study offers advantages of acquiring detailed information about the subject through an in-depth study. It is a method that deals with the processes that take place and their relationship. The objective is to locate the factors that account for the behavior-patterns of the given unit as an integrated totality (Kothari and Garg, 2014).

#### **iii. Survey research**

This is a method that involves the use of interviews and administration of questionnaires to a sample selected from a population. It is appropriate for both descriptive and explanatory researches (Bryman, 2001).

### **a) Interviewing**

This is a data collection method involves the administration of oral questions to individuals or groups. It involves an inter-personal relationship between the interviewer and the interviewee. This method has, however, its own advantages and disadvantages (Bryman, 2001). Its advantages being that it incorporates illiterate respondents, permits clarification of issues and gives a higher response rate than written questionnaires.

Disadvantages of the method include; the influence of the responses created by the presence of the interviewer; reports of events being incomplete as in the case of observation; the costly nature of personal interviews in terms of time and money; and the danger of serious disparities is likely if more than one interviewer is used as it reduces comparability of responses.

### **b) Questionnaires**

This method involves the use of written questions that are presented to the respondent. These are to be answered by the respondent in a written form. Two types of questionnaire surveys are available. According to Achola and Bless (1988), the two types include; self-administered questionnaire posted to the respondent and returned completed; and an administered questionnaire delivered by the interviewer.

This method has its merits and demerits when used in a survey (Kothari and Garg, 2004; Nkhata, 1997). Its advantages include:

- i. It can be less expensive than interviews;
- ii. It permits or allow for anonymity that can result in more honesty responses;
- iii. It does not require research assistants; and
- iv. Questionnaires eliminate biasness on the phrasing of questions to respondents.

Disadvantages of the method include:

- i. Self-administered questionnaires cannot be used with illiterates;
- ii. low response rates from some respondents who may complete it; and
- iii. Questions may be misunderstood in the absence of the interviewer.

There are two types of questions: (Kothari and Garg, 2014):

- i. Open-ended; and
- ii. Closed-ended or structured questions.

### **i. Open – ended questions**

These are questions which permit free responses that should be reported in the respondents' own way i.e. the respondent is not given possible answers to choose from. This is important when the researcher wants to get information on opinions, attitude and reactions to sensitive questions (Achola and Bless, 1988).

Advantages of open-ended questions include:

- a. Issues that may not have been asked may be explored;
- b. Information is given spontaneously and it is more likely to be true; and
- c. Information in the respondents' own way may be very useful.

The disadvantages is that the analysis of information based on open-ended questions can be time consuming and requires responses which are not numeric and it means going through all the questions and summarizing the relevant information.

### **ii. Closed-ended or structured questions**

This offers a list of options from which respondents must make a choice of what is most suitable. The options must be exhaustive and stiff (Achola and Bless, 1988).

Advantages of closed-ended questions include; the quick recording of answers; and the easy of analysis. On the other hand, disadvantages include; their unsuitability for face to face interviews; respondents choosing the options that they might otherwise not have thought of especially if the options are not exhaustive; information being missed out through lapses; and the respondents losing interest due to boredom and fatigue.

#### **4.4.2 Secondary technique**

This technique involves the use of available information that was collected by somebody else. The researcher in this case is the secondary user of the information. An example of such a technique is literature review. This technique has some advantages and disadvantages as well (Bryman 2001).

Advantages include:

- i. It is inexpensive in that the data is already in existence and one just has to pick it; and
- ii. It permits the analysis of trends such as traffic or population growth trends.

Disadvantages include:

- i. Ethical issues of confidentiality might make the information not to be availed; and
- ii. Information may be incomplete and imprecise due to methods employed.

#### **4.5 Research design**

This study was designed to address the problem identified in Section 1.2 and achieve the objectives outlined in Section 1.2.2. It was considered essential to obtain a full understanding of the study by setting out the various elements in a logical sequence, so as to avoid misunderstanding at any point in the research. The problem statement, aims and objectives of the research were therefore stated at the outset. In order to present clear perspectives about the delivery of public infrastructure through Public Private Partnerships in construction projects and to bring out the effects, it was decided to conduct the study in four phases. The first was comprehensive literature review. This phase overlapped all the other phases as it was important that even latest information on the research subject be incorporated. Data collection which was done through case studies, interviews and questionnaire surveys constituted the second phase. The triangulation of the various methods was done to enhance the confidence that can be placed on the research findings (Spector, 1981). The third phase was the analysis of the data collected. The information from the earlier stages was then used in the fourth phase as the input data. The



fourth phase was the development of the conceptual model for planning, implementation and monitoring of PPP construction projects.

#### **4.5.1 Literature review**

Literature was reviewed in terms of its contents and methodology used by other researchers in similar studies. This approach was fundamental in laying the foundation of the research, building it up on what has been done in other parts of the world. The advantage of this approach was its cost effectiveness as articles from almost all over the world could readily be read without having to travel to see how other countries dealt with the research problem (Taylor, 2004). Literature from journal articles was of interest during the review period because they offered a relatively concise, up-to-date format for research and all reputable journals were used. Where adequate information was missing, other articles were sought for. These included: conference proceedings; government/corporate reports; thesis and dissertations; and e-journals.

The main objective throughout the review stage was to identify factors likely to be relevant in studying Public Private Partnerships. In order to achieve the objectives, a systematic literature review was conducted. The objective was to (UCSC, 2006; Achola and Bless, 1988):

- i. Define and limit the research questions being worked on;
- ii. Place the study in a historical perspective;
- iii. Avoid unnecessary duplication;
- iv. Identify approaches to research design and methodology; and
- v. Clarify the future direction for the study.

##### **4.5.1.1 Literature sources**

The source of information can be considered to be an important factor when checking the validity of the information obtained. Below is a brief discussion of the various sources of information (Languages Centre, 2005).

- i. **Journal articles** are good especially for up-to-date information. It should be born in mind, though, that it can take up to two years to publish articles. Journal articles are frequently used in literature reviews because they offer a relatively concise, up-to-date format for research and because all reputable journals are refereed.
- ii. **Books** tend to be less up-to-date as it takes longer for a book to be published than for a journal article. Text books are unlikely to be useful for literature review as they are intended for teaching, not for research, but they do offer a good starting point from which to find more detailed sources.
- iii. **Conference proceedings** can be useful in providing the latest research, or research that has not yet been published. They are also helpful in providing information on current research areas, and as such can be helpful in tracking down the work done by others.
- iv. **Government and corporate reports** - many government departments and corporations commission research projects. Their published findings can provide a useful source of information, depending on the field of study.
- v. **Newspapers** are generally intended for a general and not specialized audience, the information they provide will be of very limited use for literature review. Often newspapers are more helpful as providers of information about recent trends, discoveries or changes, for example announcing changes in government policy, but one needs to then search for more detailed information in other sources.
- vi. **Theses and dissertations** can be useful sources of information. However there are disadvantages: they can be difficult to obtain since they are not published, but are generally only available from the library shelf or through inter-library loan; and the student who carried out the research may not be an experienced researcher and therefore the subsequent researcher might have to treat their findings with more caution than published research.

**vii. Internet** is the fastest-growing source of information. It is impossible to characterize the information available but there are some hints about using electronic sources: it should be borne in mind that anyone can post information on the internet so the quality may not be reliable; the information found may be intended for a general audience and may not be suitable for inclusion in literature review as information for a general audience is usually less detailed; and more and more refereed electronic journals are appearing on the internet. If they are refereed, it means that there is an editorial board that evaluates the work before publishing it in their e-journal, so the quality should be more reliable depending on the reputation of the journal.

**viii. CD-ROMS** - at the moment, few CD-ROMs provide the kind of specialized, detailed information about academic research that one needs for detailed scientific investigations since most are intended for a general audience. However, more and more bibliographies are being put onto CD-ROMs for use in academic libraries, so they can be a very valuable tool in searching for the information a researcher needs.

**ix. Magazines** intended for a general audience are unlikely to be useful in providing the sort of information one needs. Specialized magazines may be of use, but usually magazines are not dependable sources for research except as a starting point by providing news or general information about new discoveries, policies, etc. that one can further research on in more specialized sources.

Based on the above appraisal of the various sources of information, literature review was conducted covering trade and academic journals, books, institutional and statutory publications, the internet, seminar and conference papers.

The objectives identified in Section 1.2.2 were addressed through the literature reviewed as follows:

- i. Presentation and discussion of the previous related studies; and
- ii. Identification and description of the list of challenges, risks and benefits.

## **4.5.2 Data Collection**

### **4.5.2.1 Interviews**

Interviews were conducted prior to questionnaire surveys. The interviews were aimed at obtaining preliminary data that would enhance the questionnaire survey as such the sample did not exceed 20 participants. The participants were selected to ensure that various viewpoints of the main stakeholders in the construction industry were incorporated in the questionnaire survey as such the interviews were targeted at professionals working for clients, consulting firms and contractor organizations within the public construction sector in Zambia. Only firms, organizations and professionals with experience on PPP construction projects were selected. The interviews were limited to participants within Lusaka, the capital city, due to the short time required to get preliminary data.

### **4.5.2.2 Questionnaire Survey**

The self-administered questionnaire survey was adopted as the main research instrument based on the advantages that a representative sample would be realised with little time or costs. The method allowed most stakeholders in the Zambian construction sector to make their contribution. The respondents were assured of anonymity which in turn helped them to be honest in their answers. Also bias due to personal characteristics of the interviewer was avoided, as no interview was used. This was critical in this study as the respondents might have tried to impress the interviewer if present, thereby portraying a picture that their organisation had successful PPP agreements. This method also allowed respondents to have adequate time to consult where they were not sure, thereby answering the questions more appropriately. These factors made this method more advantageous compared to the other methods available.

With the above advantages noted, the questionnaire was designed to meet the research aim and objectives. Firstly, the information presented in the previous chapters helped to widen the author's knowledge and create an awareness of other issues that might not otherwise have been taken into account. A provisional version of the questionnaire was then developed to cover all

aspects needed to accomplish the purpose of the research. However, it was also necessary to ensure that the questionnaire was reliable.

For this reason, a quality control process was undertaken, by ensuring that each objective had questions corresponding to it, passing through a pre-test in which three potential respondents were asked to fill in the questionnaire in order to examine the level of clarity, and ending with an approval procedure by the research supervisor.

The purpose of the questionnaire survey was to measure the levels of impact, constraints, challenges and benefits of PPPs in construction projects. The data collected were then used as input for the PPP model.

In order to present the questionnaire in a systematic way, it was decided to divide the questions into seven sections:

- i. Questions concerned with respondents' experience;
- ii. Questions concerning contractual arrangements that the respondents had been involved in;
- iii. Questions dealing with impact of PPPs on construction projects the respondents had been involved in. The responses had a scale range of 1 to 5 for the levels of impact of each probable cause.
- iv. Questions dealing with perceptions on the handling of challenges in PPP projects. the questions had a scale range of 1 to 4 for the frequency and severity of each probable cause.
- v. Questions on some of the public concerns challenging the implementation process of PPP projects in Zambia. The questions had a scale range of 1 to 5 for the levels of importance of each concern on PPPs on construction projects.
- vi. Questions dealing with prevalence of the identified risks from the interviews which the respondent experienced on PPPs. The questions had a scale range of 1 to 5 for the levels of prevalence of each factor.
- vii. Questions on the future of PPPs in Zambia

The questionnaire made provisions for capturing extreme cases by providing options that allowed for specifications to be made by the respondents.

#### **4.5.2.2.1 Questionnaire writing, distribution and collection**

The questionnaire was written in one format and distributed to professionals working for contractors, consultants, and government departments and agencies in Zambia.

Three points were considered in order to obtain a high response level by:

- i. Providing a covering letter for:
- ii. Identifying the type of research, sponsoring organisation and the researcher's name;
- iii. Explaining the purpose and the benefits of the study;
- iv. Encouraging the participants to fill in the questionnaire in a solicitous language;
- v. Informing the participants that their name, department name would not appear;
- vi. Structuring the questionnaire in a neat format; and
- vii. Keeping the questionnaire as short as possible, but comprehensive enough.

It was decided to use appropriate distribution method for each respondent. For speed of response, some questionnaires were distributed personally and collected by hand. This method was effective as it ensured that the questionnaires reached the targeted organisations in good time and within budget. For the other respondents who could not be easily reached, the questionnaires were distributed and collected via the post.

Apart from the simple style and structure of the questionnaire, two points were considered in the design of the postal questionnaire to guarantee a fast and high response level:

- i. A reply envelope was provided inside each letter; and
- ii. A stamp was affixed to each reply envelope.

#### 4.5.2.2.3 Sample Survey

The population sample of this research was composed of four strata: clients and their representatives, financiers, consulting engineers and contractors working in the construction field in Zambia within the public sector with experience on PPP construction projects. The disproportionate stratified sampling technique was employed so as to allow any minority to be represented. Due to the limited number of PPP construction projects, only ten participants in each stratum were targeted.

#### 4.5.2.2.4 Methods of analysis

Data collected from the survey were analysed using descriptive statistical techniques. An advanced and accurate analysis method was needed to arrange the large body of data in a systematic, fast and reliable way. For this purpose the computer software Statistical Package for Social Science (SPSS) and Excel were chosen as the best options available.

Questions in section C and E of the questionnaire survey asked the respondents to rate the levels of importance and impact of PPPs on construction projects. The likert scales provided ranged from 1 to 5 as shown in Table 4.1. The quantitative measures of the levels of impact and importance were obtained using the same scale that was assigned to them.

**Table 4.1** *Levels of impact*

Scale	Level of impact	Weight
1	Least important	1
2	Not very important	2
3	Important	3
4	Very important	4
5	Most important	5

Possible constraints to the implementation of PPP construction projects identified from literature and confirmed during interviews were compiled and evaluated in the questionnaire survey. Possible risk factors to project delivery and benefits grouped in five key areas were also identified and evaluated in the questionnaire survey.

The data collected were analysed using statistical methods. The reliability of the five point Likert scale used in the survey questionnaire was tested for internal consistency using the Cronbach's coefficient,  $\alpha$ . Values of  $\alpha = 0.7$  are an acceptable indication of the reliability of the scale (Siegel and Castellan, 1988). A value of  $\alpha$  equal to 0.7458 was obtained, thus confirming the reliability of the scale.

The overall ranking of the constraints, by both public and private sector respondents to the delivery of PPP construction projects was obtained using the mean score (MS) method (ibid). To determine the ranking for each factor using the five-point Likert scale, one (1) was assigned 'Least Important' and five (5) 'Most Important'. The factor rankings were then arranged in descending order of importance. The MS for each constraint was computed using the following formulae (Siegel and Castellan, 1988):

$$MS = \frac{\sum (f \cdot X_s)}{N}$$

Where  $1 \leq MS \leq 5$

MS = mean score

f = frequency of response to each rating (1-5) for each constraint;

s = score given to each constraint by the respondents, ranging from 1 (Least Important) to 5 (Most Important); and

N = Number of responses to that constraint.



In case of occurrence of a tie, the criterion for ranking was obtained based on the percentage of respondents strongly agreeing to the identified constraint.

The Mann Whitney U test, generating  $p$  values, was used to determine whether or not there was a significant difference between the mean ranks for the constraints to implementation of PPP construction projects between the public and private sector respondents. A  $p$  value lower than 0.05 showed that there was a difference in perceptions between the two groups of respondents regarding the identified constraint (Kothari and Garg, 2014; Siegel and Castellan, 1988).

To complement the Mann Whitney U test, the Spearman rank correlation coefficient ( $r_s$ ) test was also performed to measure the level of agreement between the two respondent groups on their ranking of constraints in the implementation of PPP projects in Zambia. Association by the respondents in the rankings was indicated by  $r_s$  being significant at the level of 0.05 or less, i.e., for  $r_s$  greater than 0.05, there was no significant disagreement between the two respondent groups on the ranking of the constraints to implementation of PPP construction projects (Siegel and Castellan, 1988).

#### **4.5.2.2.5 Case studies**

A case study refers to a fairly intensive examination of a single unit such as a small group of people, or a single company. Case-studies involve measuring what is there and how it got there. It is historical.

Since the case-study enables rich information to be gathered from which potentially useful hypotheses can be generated, it was used in this study. Disadvantages are that it is inefficient in researching situations which are already well structured and where the important variables have been identified. It is also time consuming.

Case studies of three PPP construction projects were undertaken. The studies were aimed at investigating the performance of contractual agreements. Where possible, case studies highlighted how PPP agreements were dealt with in different economic environments. Care was

taken to differentiate these experiences according to the economic status of the different periods. This was to avoid the adoption and recommendation of unworkable and unrealistic principles to apply them to the economy.

#### **4.5.3 Model development**

The PPP Model was developed based on systems theory developed in the 1950s. The model adopts the systems thinking viewpoint, where role players are supposed to see the broader picture of ongoing, reciprocal relationships (Andrew, 1999), which a PPP project may be exhibiting. One of the core impediments to the systems thinking approach in PPP processes is lack of project management expertise. The model proposes to encapsulate a fully-fledged role of a qualified project manager, complete with an integrated project management system in the delivery processes.

The model was constructed with the aim of defining processes for project implementation and management of end-user inputs over the entire project life cycle. The model adapts a visual graphical method of demonstrating relationships between project resources, activities, outputs, and outcomes. It could be used as a planning, implementation and monitoring tool that a project would employ to conduct activities that are intended to produce specific, describable, and measurable changes or results in organizations, or the broader physical and social environment.

The information gathered through literature review, interviews and the questionnaire surveys was analyzed to provide the basis for proposals to improve and effectively plan, monitor and implement PPP construction projects through the use of a model. In preparing the PPP model, the flow chart approach was found suitable. A flow chart is easy to understand and explain relationships, showing how steps in a process fit together. This make it a useful tool for communicating how processes relate to each other, and for clearly documenting how a particular function is performed.

## **4.6 Summary**

This chapter presented the methodology used to carry out the research and address its aims and objectives. Highlights about the various methodologies that could be adopted for research purposes were also included in this chapter. The chapter further presented an explanation of how the problem was investigated and described the tools used to undertake the investigation. It also described the characteristics of the research sample and the method of analysis that was employed. The next chapter discusses the data collected and analysed in the study.

## **CHAPTER FIVE: DATA ANALYSIS**

### **5.1 Introduction**

The previous chapter described common research methodologies and the available methods used to collect data.

### **5.2 Interview data and analysis**

Interviews were conducted between January and March 2011. They were preliminary in nature and targeted fifteen (15) firms working with contractors, consultants, clients (public sector) and financiers who have had experience on PPPs in public sector construction projects. The objective of the interviews was to obtain preliminary data that could assist in enhancing the utility of the questionnaire survey. The interviewees were selected based on the exposure of their firm to PPP projects to ensure that the varied views of the main stakeholders in the construction industry are incorporated in the study findings. The method used for selecting the interviewees was based on convenience. Though the organizations interviewed were national, the interviewees were based in the capital city, Lusaka.

The analysis of interview data was done by listing down the responses to each question, noting down the frequencies of the responses and the salient issues brought out by the interviewees.

#### **5.2.1 Pretesting**

The structured interviews were biased towards the collection of qualitative data. This data collection method brought out the multifaceted dimensions, perspectives and complexities surrounding PPP project delivery in public sector infrastructure. The interview questions went through a process of several reviews and a draft of the questions was pilot-tested with three (3) participants to ensure that questions were clear and unambiguous. Pretesting was particularly important to establish whether the sequencing and arrangement of questions was in order and if terms such as PPPs and others would be understood.

### 5.2.2 Respondents' profile

The study was undertaken by means of conducting semi-structured personal interviews of the organizations (private and public) involved in Public Private Partnerships within the construction industry in Zambia. These organisations were selected using simple random sampling (Kothari and Garg, 2014). Out of the 15 targeted organisations, 11 participated. Four could not participate due to other commitments that made them not available. Of these, 6 represented 54.55 percent from public sector were interviewed and 5 represented 45.45 percent from the private sector as shown in Table 5.1.

**Table 5.1** *Summary of Respondents*

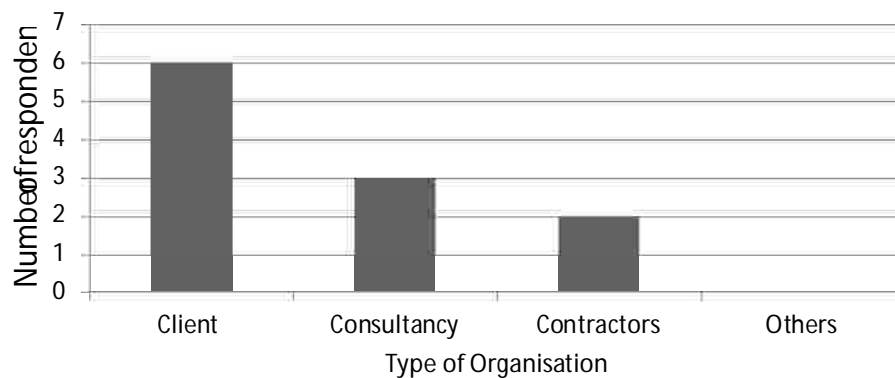
Variable	Frequency	Percentage
Public Institutions	6	54.55
Private Institutions	5	45.45
<b>Total</b>	11	100.0

Out of the 11 organisations that responded, 6 had less than five years of experience of working with PPPs and were handled by individuals in middle to top management as shown in Table 5.2. The other 5 had between five to ten years of experience in PPPs and were in top management.

**Table 5.2** *Years of experience per sector of industry*

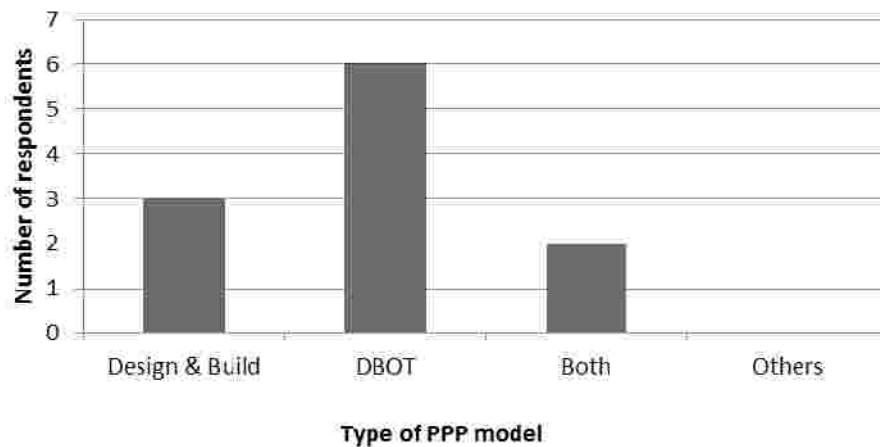
Years of Experience	Sector of industry			Total
	Public	Private	Other	
< 5 years	4	2	0	6
5 – 10 years	2	4	0	5
> 10 years	0	0	0	0

In Figure 5.1, 6 interviewees worked for public sector organizations, two for contractors and three for consultancy firms. This provided an assurance of reasonable professional experience in the execution of public sector projects through PPPs. The firms' experience in PPP projects ranged from four to nine years.



**Figure 5.1:** Number of interviewees per type of organisation

In Figure 5.2, 6 of the interviewees have had experience with Design, Build, Operate and Transfer (DBOT) projects, 3 with Design and Build (DB), 2 with both models while none had worked with other models.



**Figure 5.2:** Number of respondents per type of PPP projects

### **5.2.3 Delivery of public sector infrastructure through Public Private Partnerships**

There was a general agreement that the PPP model has delivered public sector construction projects successfully so far. The interviewees indicated that the PPP model has experienced less challenges when dealing with poor performance, schedule overrun and over expenditure, which is prevalent in most construction projects in Zambia. The interviewees acknowledged the potential benefits coherent in PPPs that could benefit the Zambian economy though they expressed concern about the slow pace of the private sector in embracing this approach to delivery of projects.

### **5.2.4 Impact of Public Private Partnerships on construction projects**

The first objective of the interviews was to assess the impact of Public Private Partnerships on construction projects, whether or not there was an improvement in the delivery process compared to the use of traditional procurement methods. The initial question was intended to initiate the interview with all the 15 organisations. The question was fairly broad and provided interviewees with the opportunity to begin their answer broadly and to break it down towards a concise opinion.

Though some of the interviewees expressed concern that it was too early to notice the impact of PPPs on construction projects in Zambia, all of them highlighted a number of ways in which this method of project execution had impacted the delivery of public sector works. Interview responses on the impact of these projects were grouped in the following highlighted areas:

- i) Reduced risk of handling- Since only professionals handle PPP projects, the risk of handling is low as there is professional scrutiny. Tendering involves professionals thus resulting in less strain on regulators.
- ii) Improved levels of services– PPPs have improved the levels of services in infrastructure provisions. The designs have been aesthetically pleasant while integrating better services.

- iii) Economic benefits– PPP projects have created more employment on a large scale since they integrate other range of services related to infrastructure provision like internet, telephone, security, and businesses.
- iv) Cost savings– The prudent use of financial resources has caused a lot of cost savings. The Government has received budget relief since the private partners use their own financial resources. PPP projects like the Luburma market and University of Zambia Foot Bridge have provided the infrastructure for the public which otherwise the government would not have been able to fund.”
- v) Increased infrastructure volumes– The efficient implementation within time, cost and desirable quality has resulted in an increase in the volumes of infrastructure delivery.

### **5.2.5 Handling of delivery challenges using PPPs**

Questions on how PPP projects had handled the delivery challenges that traditionally procured projects experienced, were posed. Though some felt that there was need for more time to evaluate the effect of PPP projects, most of the interviewees highlighted that PPPs had adequately addressed the challenges of poor performance, over expenditure and schedule overruns. One interviewee warned that though PPPs may seem to be better, they were not the panacea to every problem. These responses were grouped in the following categories in order to highlight how these projects handled the delivery challenges.

#### **5.2.5.1 Poor Performance**

Respondents were asked questions regarding the performance of PPPs compared to traditionally procured projects. The following aspects of PPP projects in terms of performance were identified:

- i. PPP projects enhanced the value for money by bringing out the desirable quality.
- ii. They provided for better performance so as to attract more users.
- iii. PPPs were competitive and aimed at providing a long term product that would last.



#### **5.2.5.2 Over expenditure**

Respondents were asked questions regarding the budget expenditure of PPPs compared to traditionally procured projects. The following aspects of PPP projects in terms of performance were identified:

- i. PPP projects do not encourage budget overruns because of the stringent, bankable and watertight systems.
- ii. Since political risks were not usually involved, there would be no over expenditure.
- iii. Over expenditure may not be an issue with PPPs since the private sector is the funder and there interest is to provide infrastructure within the available money.
- iv. PPP projects do not have any interim payments which usually cause overpricing and over expenditure in traditionally procured projects caused by Governments' delays to pay.

#### **5.2.5.3 Schedule overrun**

Respondents were asked questions regarding the project schedules on PPPs compared to traditionally procured projects. The following aspects of PPP projects in terms of performance were identified:

- i. PPPs were time saving as executors are the owners and their goal is profit making.
- ii. The PPP procurement method was well timed so as to hasten the returns.
- iii. Negotiations with PPPs were shorter since most of the risks are shared.
- iv. PPP projects used borrowed money and there was need for quick procurement procedures since each lost day resulted in more loan interest accumulating. If a PPP project did not complete in time, there was a cost attached to that.
- v. This may not be an issue because it is in the best interest of the private sector to complete on time.
- vi. This was not likely to happen with adequate funding from the private partner. Government's delays in making payment to contractors were the major cause of schedule overruns in traditionally procured projects.

### **5.2.6 Benefits of PPPs in delivering public sector infrastructure**

The third question explored the benefits found in using PPPs in delivering public sector infrastructure. It was clear from literature that PPP projects delivered a lot of benefits. These benefits varied depending on the nature of the PPP agreements. The responses were also put in common groups highlighting the benefits, including; client confidence, enhanced accountability, reduced project delivery time, enhanced project performance, economic benefits, innovation; and risk sharing.

### **5.2.7 Potential risks in PPPs in construction projects**

The fourth question explored the potential risks inherent in PPP projects. It was clear from literature that there are a lot of risks inherent in PPP projects. These risks vary depending on the nature of the PPP agreements and affect the concessionaire such that they may not recover their investment on time and revert to other means to recoup their investment. The interview responses were grouped in highlighting the following risks:

#### **5.2.7.1 Pre-construction risk**

- i. **Corruption-** common in the procurement process where a certain partner can be selected while not meeting the criteria. The partner might not even be the best solution provider to the need for the public infrastructure.
- ii. **Loss of control by Government–** Since PPPs involve the sharing of risks, benefits and decision making between the partners, the private partner may assume a lot of control in decision making thus destroying the public interest.
- iii. **Concession Period–** If the concession period is too long, it may result in the private partner handing-over infrastructure with low life span after the concession.

#### 5.2.7.2 During Construction risks

- i. **Labor issues**– If the local laborers were not well handled, pressure may prevent the project from meeting the desired deadlines;
- ii. **Political environment**- If the political condition changes due to regime change, certain PPP agreements may be distorted causing a loss on the private partner.
- iii. **Shareholding**- In PPP projects, there exist a risk of shareholding. If the choice of the shareholder is not right, the whole PPP agreement may experience adverse effect. All the parties must ensure that the shareholding in the other partner organizations is strong enough to avoid this risk. If one partner pulls out of the agreement, the infrastructure may not be completed in time.

#### 5.2.7.3 Post-construction

- i. **Financial risks**- These are also potential throughout the PPP concession period. There is the risk of inflation and depreciation to either side. This may cause a loss to the PPP project. This risk can be within a local economy or a global economy.
- ii. **Technology change**- Over a long period of time, technology change occur which may change the taste of users thereby affecting the profit yield of a private partner. The infrastructure may also not be useful due to these taste changes at the time the private sector is handing it over to the public sector. The new technology may introduce new PPP projects in the same type of infrastructure that may better meet the changes in the user's tastes and needs.
- iii. **Natural calamities**– Environmental conditions including floods, earthquakes, bush fires and many others may terminate or destroy existing infrastructure which may result in investment loss.
- iv. **Competition**- There is a risk resulting from competition with other PPP projects. Investors may provide similar products creating competition which may result in low turn-over to some investors. This may arise where the Government engages in PPPs of similar nature within the same area with different investors.

### 5.2.8 Challenges affecting PPPs in Zambia and what needs to be done.

Questions aimed at obtaining the challenges affecting the implementation of PPPs in Zambia were posed. Table 5.3 presents responses that highlighted the challenges with their possible solutions so as to help decision makers.

**Table 5.3** *Summary of interview responses*

S/N	Challenge	Solution
1	Lack of capacity as few people are embracing PPPs and experts are very few	Train as many professionals as possible in order to increase public awareness and increase in research and development.
2	Lack of exposure to requisite experience	Need to involve local people in every level of PPP execution in order to transfer knowledge and expose them.
3	Zambia is a small economy which may not meet the expected volumes e.g. when dealing with toll roads, certain high ways may not have the high requisite volume to make profits.	There is need to study each PPP project and properly assess the volumes that will utilize the facilities.
4	Poor support infrastructure in other areas like internet, education, etc.	There is need to create sustainable and integrated infrastructure developments that can support each other.
5	Procurement procedures are not very clear and are cumbersome making it difficult for some investors to participate.	There is need to simplify the procurement procedures so as to attract more investors while maintaining high levels of standards.
6	The period of hand-over to Government is too long in certain projects like Luburma Market.	Developing of capacity in tendering procedures, tariff setting, and contract compliance guidelines

S/N	Challenge	Solution
		for companies that want to partner with the Government.
7	The need to protect the Government from unscrupulous or speculative private partners at this early stage	Development of capacity in the various technical aspects of PPP design and implementation at any Government level

### 5.2.9 Opportunities available in construction projects that could favor PPPs

The other objective of the research endeavored to establish whether or not opportunities exist in the construction projects that could favor PPPs. There was general consensus among the interviewees that:

- i. Zambia is a growing economy making it a good ground for the implementation of PPPs;
- ii. There is enough land in Zambia to execute any form of infrastructure development via PPPs;
- iii. Zambia needs a lot of public infrastructure in borders, roads and air transport which the Government is not able to provide;
- iv. There are a lot of PPP opportunities in money making ventures of a public nature as opposed to other public projects like hospitals, schools and administrative buildings. These projects include shopping malls, housing, tourism infrastructure and many others; and
- v. Zambia is still lagging behind in technology which makes it a better place to develop infrastructure that is technologically new in meeting the changing needs of the users.

### 5.2.10 Key factors that decision makers should consider to create successful PPPs

Questions aimed at obtaining the key factors that could lead to the creation of successful PPPs were posed. The interviewees had various responses that highlight their views. The following

factors were compared and analyzed to assess which ones would be said to be common as appraised by the interviewees:

- i. Viability of the PPPs and its impact on the infrastructure development process;
- ii. The economic benefits of PPP agreements;
- iii. The involvement of local people rather than using foreign investors;
- iv. Encouraging companies listed on the stock exchange to go into PPPs since they are monitored by financial institutions;
- v. The need to engage partnerships with integrated shareholding companies with low risks of collapsing;
- vi. The analysis of all risk dependent factors;
- vii. The need for adequate planning;
- viii. The need for agreements to have sound contractual arrangements;
- ix. The ascertaining of the source of funds for PPP projects to avoid bankruptcy resulting in provision of poor infrastructure; and
- x. The need for a PPP unit in Zambia to train more experts.

#### **5.2.11 Future of PPPs in Zambia**

Most of the interviewees were concerned with the rate at which the country was moving in rolling out PPP projects. There was a general concern that the future of PPPs may not be very bright interviewees admitted that PPPs were here to stay regardless of the fact that the local market may take time to come on board. There were views that indicated that Zambia needed to work out its PPP policy such that it would favor local participation within the structures. Others felt that there is need to further simplify PPP models so as to fit the local economy.

Some of the interviewees insisted that the structure of the PPP unit did not meet the desired grouping. The views were that the unit need to incorporated specialists in various areas of need that can advise every PPP project accordingly rather that involving so many scattered stakeholder organizations.

### **5.3 Questionnaire Survey**

#### **5.3.1 *Profile of respondents***

Respondents were from client organizations, consultants, contractors and financiers of PPP construction projects in either the public or private sector of the industry. The data obtained indicated that 55 percent of the respondents worked for client organizations, 15 percent for consulting firms, 25 percent for contractors and 5 percent for financiers. The respondents' years of experience in PPP construction projects ranged from 0 to 10 years with over 50 percent having had more than 5 years of experience. Sixty two percent of the respondents had dealt with PPP construction projects with values exceeding US\$10 million, while 25 percent on projects that cost less than US\$5 million. The remaining group worked on projects of values between US\$5 million and US\$10 million. The level of exposure exhibited by the respondents suggested that a fairly high degree of reliability could be derived from the study findings.

#### **5.3.2 *Statistical analysis***

Twenty-three possible constraints to the implementation of PPP construction projects identified from literature and confirmed during interviews were compiled and evaluated in the questionnaire survey. Twenty four possible risk factors to project delivery and benefits grouped in five key areas were also identified and evaluated in the questionnaire survey.

The data collected were analysed using statistical methods. The reliability of the five point Likert scale used in the survey questionnaire was tested for internal consistency using the Cronbach's coefficient,  $\alpha$ . Values of  $\alpha = 0.7$  are an acceptable indication of the reliability of the scale (Siegel and Castellan, 1988). A value of  $\alpha$  equal to 0.7458 was obtained, thus confirming the reliability of the scale.

The overall ranking of the constraints, by both public and private sector respondents to the delivery of PPP construction projects was obtained using the mean score (MS) method (ibid). To determine the ranking for each factor using the five-point Likert scale, one (1) was assigned 'Least Important' and five (5) 'Most Important'. The factor rankings were then arranged in

descending order of importance. The MS for each constraint was computed using the following formulae (Siegel and Castellan, 1988):

$$MS = \frac{\sum (f \times X^2 s)}{N}$$

N

Where 1= MS =5

MS = mean score

f = frequency of response to each rating (1-5) for each constraint;

s = score given to each constraint by the respondents, ranging from 1 (Least Important) to 5 (Most Important); and

N = Number of responses to that constraint.

In case of occurrence of a tie, the criterion for ranking was obtained based on the percentage of respondents strongly agreeing to the identified constraint.

The Mann Whitney U test, generating *p* values, was used to determine whether or not there was a significant difference between the mean ranks for the constraints to implementation of PPP construction projects between the public and private sector respondents. A *p* value lower than 0.05 showed that there was a difference in perceptions between the two groups of respondents regarding the identified constraint (Siegel and Castellan, 1988).

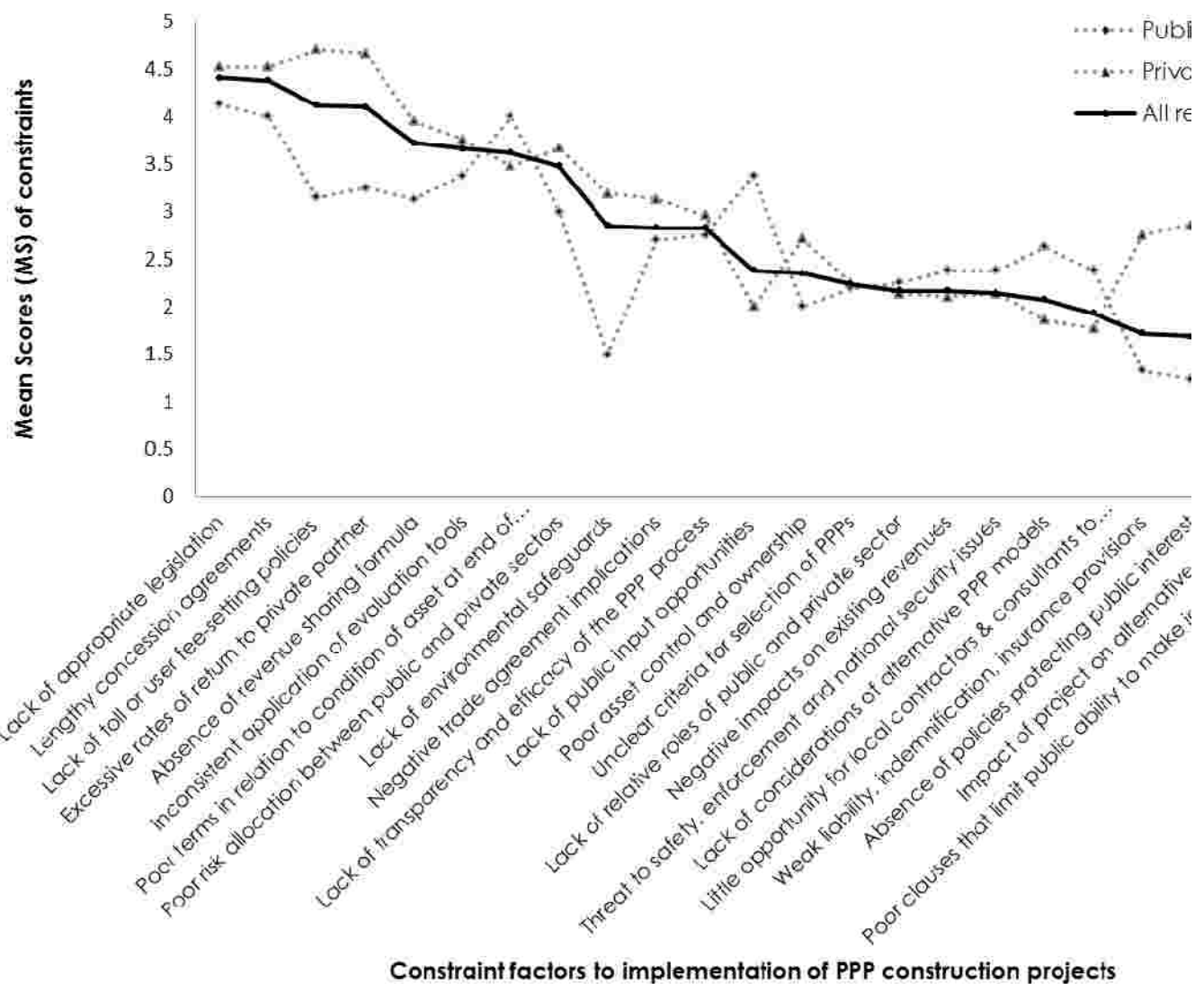
To complement the Mann Whitney U test, the Spearman rank correlation coefficient (*r<sub>s</sub>*) test was also performed to measure the level of agreement between the two respondent groups on their ranking of constraints in the implementation of PPP projects in Zambia. Association by the respondents in the rankings was indicated by *r<sub>s</sub>* being significant at the level of 0.05 or less, i.e., for *r<sub>s</sub>* greater than 0.05, there was no significant disagreement between the two respondent groups on the ranking of the constraints to implementation of PPP construction projects (Siegel and Castellan, 1988).



### ***5.3.3 Analysis of constraints to the implementation of PPP construction projects***

Twenty-three constraints ranked by respondents from the public and private sectors were compared. The constraints were evaluated to determine their relative importance as perceived by both public and private sector stakeholders in the Zambian construction industry. Figure 5.3 presents the identified constraints based on comparison of MSs.

Factors with MS values greater than 3.40 were considered significant. This was based on the interpretation that those factors had an over 75 percent chance of inhibiting project delivery. On that basis, factors with MS values less than 3.40 were eliminated. Eight constraints remained on the list.



As shown in Figure 5.3, the top eight constraints to the implementation of PPP construction projects were: lack of appropriate legislation; lengthy concession agreements; lack of toll or user fee-setting policies; excessive rates of return to private investors; absence of revenue sharing formulae; inconsistent application of evaluation tools such as value-for-money and benefit-cost analysis; poor terms in relation to the condition of assets at the end of the concession; and poor risk allocation between public and private sectors.

Factors relating to little opportunities for local contractors and consultants to participate; weak liability, indemnification, insurance provisions; absence of policies to protect public interest; impact of projects on alternative routes; and poor clauses that limit public ability to make competing improvements were considered insignificant in constraining the implementation of PPP construction projects. This, however, did not mean that the constraints were absent in the Zambia construction industry.

The Spearman's correlation coefficient  $r_s$  of 0.451 was obtained. This implied, with 99 percent confidence, that there was agreement regarding the ranking of constraints to implementation of PPP construction projects between the public and private sector respondents.

The Mann Whitney U test generated a  $p$  value of 0.054 which confirmed that perceptions regarding constraints between public and private sector respondents were the same. The results suggested that both public and private sectors were sensitive to shortcomings in the regulatory, risk management, financial and economic environments.

**Figure 5.4**

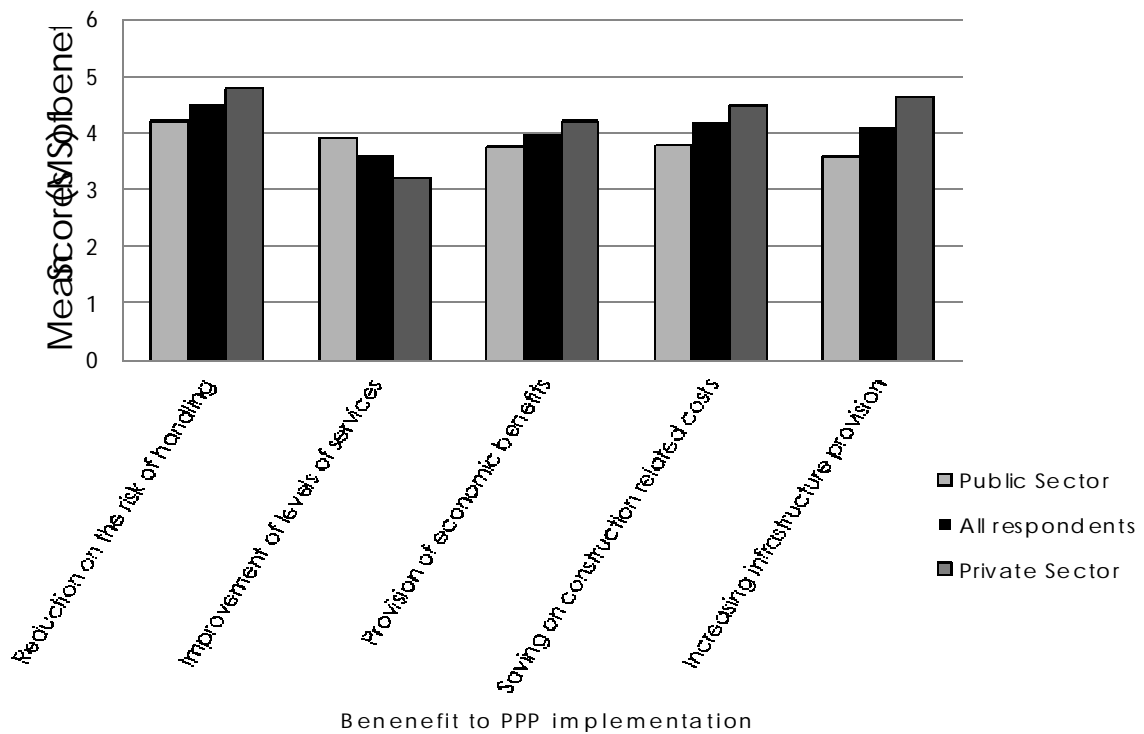
#### ***5.3.4 Analysis of risks to the implementation of PPP construction projects***

Twenty four risk factors ranked by the respondents from the public and private sectors were compared. The risks were later evaluated to determine their relative importance as perceived by the public and private sector respondents in the Zambian construction industry. Factors with MS importance values greater than 3.40 were considered to be significant. This was based on the interpretation that the factors had an over 75 percent chance of inhibiting project delivery. For this reason, factors with MS values less than 3.40 were eliminated. Five major constraints remained on the list.

The results in Figure 5.4 indicate that the top five risks prevalent in the implementation of PPP construction projects in Zambia were: stakeholder project approval; corruption; inflation; environmental considerations; and lack of experience in PPP arrangement. A test on whether or not there was agreement between public and private sector respondents regarding the ranking of risks to the implementation of PPP construction projects using Spearman's correlation coefficient produced an  $r_s$  of 0.463. Therefore, there was no significant disagreement between public and private sector respondents regarding the ranking of the risks to implementation of PPP construction projects. This implied, with 99 percent confidence, that there was significant agreement regarding the ranking of risks to implementation of PPP construction projects between public and private sector respondents. The Mann Whitney U test  $p$  value of 0.063 confirmed that the perceptions between public and private sector respondents regarding constraints were not significantly different.

#### ***5.3.5 Analysis of benefits to the implementation of PPP construction projects***

Five benefits ranked by the respondents from the public and private sectors were compared. The benefits were evaluated to determine their relative importance according to public and private sector stakeholders in the Zambian construction industry. Benefits with MS values greater than 3.40 were considered to be significant. This was based on the interpretation that the factors had an over 75 percent chance of supporting improved project delivery. Figure 5.5 presents the results of tests on the benefits to the implementation of PPP construction projects.



**Figure 5.5: Benefits to PPP implementation**

The benefits were considered to be significant given that the MSs of: reduction on the risk of handling; improvement of the levels of services; provision of economic benefits; saving on construction related costs; and increase in infrastructural provision were greater than 3.40. These benefits could be termed as success factors. Rockart (1982) defined success factors as ‘those few areas of activity in which favourable results are absolutely necessary for a manager to reach his or her goal’. These benefits are essential to make project management successful (Alinaitwe et al., 2012; Rockart, 1982).

## 5.4 Summary

The chapter presented the data obtained from interviews and questionnaire survey. The Analysis of the data elaborated which factors are significant causes of risks, constraints and benefits to the implementation of PPPs in Zambian construction industry. The results of this chapter were integrated in formulating a flowchart model which is discussed in Chapter 7.

The next chapter presents a review of case studies.

## **CHAPTER SIX: CASE STUDIES**

### **6.1 Introduction**

The previous chapter analyzed the data that were collected in the study. This chapter presents case studies of three selected Public-Private-Partnerships (PPP) of construction projects in Zambia. The case studies were undertaken to highlight the experience and lessons learnt which should influence the design of future PPP processes and structures to improve the quality of construction projects.

The choice of case studies provided a representation across different time phases and PPP project structures. It included projects at different stages of the PPP life-cycle with varying levels of complexity.

It was expected that the case studies would assist the public authorities in:

- i. Understanding the needs, challenges and risks associated with alternate PPP arrangements in the construction sector;
- ii. Improving quality of project identification, preparation, award and monitoring of PPPs and associated issues such as, for example, governance and fiscal implications; and
- iii. Managing the transition to a large scale PPP program to improve infrastructure services.

### **6.2 Case study: Luburma Market Project**

#### **6.2.1 Project description**

Lusaka City Council (LCC) had been looking for ways and means of involving the private sector in partnering in the development of the city. One such successful partnership was that the Council entered into with China Hainan Company in the development of Luburma Market (LCC, 2009). China Hainan Company provided financial resources for the construction of a modern market at one of the city's busiest trading areas on the fringes of the central business district. The Council provided land and manpower to supervise the works. The old market at the

site comprised dilapidated, incomplete and poorly designed structures made of concrete, plastic paper and tents; and was heavily congested. It lacked basic amenities such as clean water, drainage and was a safety hazard with frequent loss of property due to fire outbreaks mainly resulting from illegal electrical power connections. The site was a health hazard due to lack of waste management and prevalence of yearly flooding. A modern market was constructed at the site comprising of an open air shed with market stalls, small market stands and some bigger commercial outlets on its perimeter. China Henan Company is running the market for a specified period of 30 years in order to recoup their investment before Council takes over the running and management of the Market. The Council and China Hainan Company had been working with the Market Advisory Committee formed by the marketers to represent and promote their interests in the development of the new market. Luburma Market developed into a regional trading center which attracted people from many urban centers in the country and even from neighboring countries (Ibid, 2009).

According to Manchishi (2014), the development of Luburma Market was achieved through a Public Private Partnership where various stakeholders were involved. This project was chosen as a case study as it was of a sizeable scale that could address various issues in the study. This project, completed in 2002 brought out many lessons to offer to this study which can help shape the future PPP projects.

Additionally, the project went through various political governance systems since 2002, were the study can draw the flaws and achievements (LCC, 2009).

### **6.2.2 PPP structure of the project**

Located in Lusaka, the capital city of Zambia, Luburma and Cha Cha Cha Markets were the first two projects to be taken through Public Private Partnership route in Zambia. The construction of Luburma market involved the demolition of unplanned structures and the construction of a new market with its related services under Build, Operate and Transfer. Besides the construction responsibility, the contractor was also required operate and maintain the market for a period of Sixty-five years from the date of completion of the construction, on a



fixed fee basis. The collection of tariff and provision of new connections during the Operation and Maintenance phase was to be undertaken by the city council directly (Ibid, 2009).

Accordingly, the PPP structure of this complex project was governed by unsolicited bids from three interested bidders and was awarded to an engineering, procurement, and construction (EPC) contractor selected through a competitive bidding process (Nkana, 2015).

According to Nkana (2015) a BOT Agreement was entered into. Through this Agreement, the contractor would finance, build and operate the market for a period as proposed in the contractor's successful bid. The contractor would be required to recover the investment on the project on the basis of a per unit rate payment from commercial outlets along perimeter only. The council agreed to collect a minimum payment of levy from the small stalls and the open shed market. It was designed to cover the company's minimum fixed operating cost and capital investment (LCC, 2009). Accordingly, the PPP structure was technically in the nature of BOT-Annuity. Following the bid process, the project was awarded to China Henan Company to design the market, supply, install and commission the structures. It was also to carry out a contract for operating and maintaining the facility for 65 years (Ibid, 2009).

### **6.2.3 Status quo**

The construction works were completed in 2002. The number of shops that was built was 121 around the perimeter of the market and 432 small stalls within the market. According to the agreement, the market is supposed to be maintained by the developer until the lease expires. The lease agreement is valid until the year 2067 (Manchishi, 2014).

### **6.2.4 Financial information**

According to LCC (2009), initially the cost of the project was estimated to be K8.9 billion, of which the final figure was not known. The financing of the project was 100 percent done by China Henan Company. No other aspects of project funding were involved in this project.

It was agreed that the concessionaire was to collect the rentals from the 121 shops while the City Council was to collect shop levy from the 432 small stalls. In addition to the above, it was also decided by the City council to collect the levy charges from the other vendors. No other financial agreements were involved in the funding of this project (Ibid, 2009).

#### **6.2.5 Process analysis**

**(a) Inception:** The Plans, Works and Development Committee (PWDC), consisting of Directors, Ward Counselors and Members of Parliament at Lusaka City Council (LCC) initiated the proposal of implementing the remodeling of Luburma Market in 2001. This was because the market that existed was an eye sore and needed to provide modern facilities (LCC, 2009)

On 30<sup>th</sup> April 2001, Lusaka City Council advertised in the public media, from which three respondents came through. On 4<sup>th</sup> July 2001, China Henan Company was selected out of the three bidders. The decision to award the contract to China Henan Company was taken by the full council that met on the 13<sup>th</sup> July 2001. On this date, a contract was offered to the contractor (Ibid, 2009).

**(b) PPP Project Preparation:** As the first step, LCC which is the biggest local authority in Zambia, and formed with the objective of improving the urban infrastructure levels in the capital city, was given the mandate to run markets in the city.

LCC used in-house expertise to prepare contract information whereas the private investor prepared the detailed technical design, prepare engineering reports for the project. The scope of work included project design, identification of location for the structures and cost estimates. LCC offered a 2.7 hectare piece of land and were looking for a private developer. LCC assumed all the risks related to land acquisition; including development approval (Nkana, 2015).

**(c) Public Participation:** The project is a unique case of public participation in decision making. The marketers who were using the old infrastructure were engaged in a consultative process from the onset. Since there had been no precedence of private participation in municipal market development projects in the city, public outreach was critical to overcome initial

resistance as well as public concerns about the need to pay for the new rental fees and levies to a private developer (LCC, 2009).

To gain acceptance and build consensus among the public, the municipality mounted a vigorous public outreach/public participation campaign with extensive media coverage to explain the project benefits, costs, and tariff system.

**(d) Procurement:** The project was structured such that an engineering, procurement and construction contractor, selected through competitive bidding process, would design and implement the market system, on turnkey works contract, and would also finance, design, build, and operate on BOT (Annuity) basis.

The procurement of private contractor for the execution of the project was carried out without specific guidelines formulated by the municipality. Lusaka City Council did not formulate any output specifications as the private developer was given a leeway to come with output expectations. A one stage bid process was adopted where a technical proposal was combined with a financial proposal (LCC, 2009).

The technical capabilities of the contractors and their experience in similar works were given importance. Of the three bidders, one was selected and the financial proposals were considered at the same time. As per financial evaluation criteria, the bidder with the best financial and technical proposal for the development of the market with a reasonable lease term was selected as the final, successful contractor.

Based on the evaluation of the proposals and on the recommendations of committee, the project was awarded to China Henan in 2001 for a lease period of 65 years (Manchishi, 2014; LCC, 2009)

**(e) Implementation:** As per the Agreement, the expected date of completion was 31st March, 2002. In order to ensure timely implementation of the project and adherence to quality specifications, a supervisory committee was set up by LCC. Unfortunately, this committee did

not conduct project monitoring except the timed inspections. Furthermore, no private or any government consultants were engaged to monitor the project delivery process. The developer managed the construction process with total control (LCC, 2009)

**(f) Delivery:** The project work was carried out in a single phase. In this phase, the construction process was executed from inception to completion. By the end of the construction works, a modern market was completed. The main objective of providing a modern market was accomplished by the time the project was handed over. The project works were completed in 2002 (Nkana, 2015)

**(g) Exit:** The contract for the operations and management of the market is expiring in 2067, after the stipulated contract period of 65 years. After expiration of the lease period, the operation and management functions would be handled over to the municipality. It was understood that the contract agreement had not worked well due to the poor arrangement, lack of contract monitoring and output specifications. The agreement which was meant to be reviewed every 10 years had never been reviewed since implementation (Manchishi, 2014; LCC, 2009) .

#### **6.2.6 Post facto Value for Money (VfM) analysis**

Manchishi (2014) argues that no value for money analysis had been done on this project. LCC did not work out any financial implications in terms of value addition, making it a pure social project. As a result, the project had not materialized any much value to the economy especially with the longer concession period. Political interference which dictated the concession period and other factors made it hard for LCC to explore the best way to implement this PPP construction project. As much as there were benefits socially, the concession is a financial risk in the absence of proper management records (Nkana, 2015).

## **6.2.7 Key learning and objectives**

**6.2.7.1 Lease Agreement for 65 years:** The period of lease for the infrastructure is too long. By the time the developer will be handing over the property, its value would have been lost. The infrastructure will be another eye sore without value, making the whole venture a huge cost to the council. The concession period as stipulated in the PPP Act of 2009 of Zambian laws should run to a maximum period of 30 years. The concession period of 65 years is too long (Kwatu, 2015; Manchishi, 2014).

**6.2.7.2 Technical Advisory:** There was no involvement of specialized local and foreign technical advisors. LCC did not have trained officers capable of handling PPP construction projects. This impacted on the level of monitoring that was given. Though a PPP construction project, the client indirectly assumed all the risks since the private developer had all the control. Risk sharing was not done. Furthermore, in the absence of technical expertise, there were no output specifications that were given to the developer (Manchishi, 2014).

**6.2.7.3 Property Maintenance:** Though the agreement stipulated that the developer was to maintain the property within 65 years, no maintenance works are being done. This could be seen from the state of the structures (Nkana, 2015).

**6.2.7.4 Contract Reviews:** The agreement to review the contract every 10 years had not been implemented by either party due to sour relationship (Ibid, 2015).

**6.2.7.5 Political will:** The project had suffered a lot of political interference from the governments of the day. This impacted the decisions made by Lusaka City Council as the ruling governments interfered in the running of the biggest municipality in the country. There had not been strong political will to monitor the project in the absence of an independent municipality.

The other issues included the following:

- i. Viability of the PPP and its impact on the development process was not done properly;
- ii. The economic benefits of PPP agreement are less (Manchishi, 2014);

- iii. The absence of the involvement of local contractors (Nkana, 2015);
- iv. The lack of an analysis of all risk dependent factors (Manchishi, 2014);
- v. The lack of adequate project planning (Kwatu, 2015);
- vi. The need for agreements to have sound contractual arrangements (Manchishi, 2014);
- vii. The lack of ascertaining of the source of funds for PPP projects; and
- viii. The need for a PPP unit in Zambia to train more experts (Kwatu, 2015).

### **6.3 Case study: Kasumbalesa Border Project**

#### **6.3.1 Project description**

The Kasumbalesa Border Post links the mineral rich Katanga province in Democratic Republic of Congo, with the Republic of Zambia and onwards, through the regional ports, to clients all over the world. The border is located on the North/West part of Zambia, some 300km from the city of Ndola, on the main and only road connecting to the capital of the Katanga province, the city of Lubumbashi. More than 10 million people reside at the Katanga province while the only channel for their welfare is via the Kasumbalesa Border point. This crossing point, being the main border crossing point, caters for all the commercial traffic going into and coming out of the DRC. Kasumbalesa attracts traffic originating or destined from/to the ports of South Africa, Mozambique, Tanzania, and Namibia as well as traffic originating or destined from/to various SADC countries. The main traffic is comprised of high value minerals (copper, cobalt) and mining inputs such as coal, sulphur, fuel, sulphuric acid as well as construction materials, mining equipment, agricultural produce and food (Zipbcc, 2010).

The border facilities were poor, hardly existed and therefore the crossing time could be delayed up to 7 days. The border post had long been identified by SADC, COMESA and the North South Corridor forums as one of the main regional obstacles for the flow of the regional trade and therefore became earmarked by the regional heads of state as one of the main priority areas towards the introduction of state of the art newly constructed facilities (Ibid, 2010).

Adequate border crossing facilities is a critical element for the flow of traffic from and to the DRC and is therefore considered as a life line to the regional economies.

The **Zambian Border Crossing Company (ZIPBCC)**, established in terms of an Agreement signed between ZBCC and the Government of the Republic of Zambia on 1<sup>st</sup> July 2009, was awarded the concession to design, build and operate the Kasumbalesa Border Post Crossing, in order to achieve the fundamental goals of the African Union and the COMESA-EAC-SADC tripartite process, of bringing about development and integration of the continent (Chazingwa, 2015).

According to Zipbcc (2010), this project was the first ever PPP/DBOT project awarded and implemented in Zambia. The award was based on the unique credentials and proven track record of the main Shareholders of the company, in successfully leading and implementing various PPP/DBOT projects throughout the region.

### **6.3.2 PPP structure of the project**

According to Zipbcc (2010), the Government of the Republic of Zambia, while implementing the due legal process supported by the detailed submission made by the **Zambian Border Crossing Company**, had contracted, on 1 July 2009, the **Zambian (IP) Border Crossing Company** to implement the Design, Build Operate and Transfer DBOT project aim to:

- i. To design, erect, finance, commission and operate a state of the art dual direction border crossing point at the **Zambian Border Post of Kasumbalesa**, as per international standards
- ii. Transform this busy crossing point into a world class facility to accommodate the increasing traffic level, for the benefit of all involved, cargo owners, road haulers, Government agencies and the people of the SADC countries.
- iii. To ensure that the design and plans shall allow the implementation of a “One Stop Border” concept based on the processing of both, South and North Bound traffic at the newly constructed facilities.
- iv. The project was to be executed on a DBOT/PPP approach based on investment estimated at 25.0 million USD.

- v. The estimated completion period was December 2010.

### **6.3.3 Status quo**

As per the Agreement the date of completion was 31st December 2010. The infrastructure was completed though the completion date was not achieved as the facility was handed over in 2011. Kasumbalesa One Stop border post facility was constructed on a 100 hectare piece of land. The facilities that were put up including Customs and Immigration offices, Government support offices, car parking, staff housing, business center and banks (Chamba, 2015; Zipbcc, 2010).

Chazingwa (2014) argues that the facility is operating throughout day and night in order to handle the increasing traffic volumes within the region. However, the Government of Zambia instituted a Commission of Enquiry on how the Kasumbalesa One Stop border was procured. Following the recommendations of the enquiry, the border facility was taken over by government on 8<sup>th</sup> October 2012 (Chazingwa, 2015).

### **6.3.4 Financial information**

The main Shareholders of the investor had played a leading role in the award and successfully implemented numerous BOT/PPP projects throughout the region, in total representing a total investment in PPP/BOT related projects exceeding USD150 million (Zipbcc, 2010).

The Zambian Development Agency, in recognizing the capacity and capability of Z(ip)BCC, to carry out and successfully implement PPP projects, extended the Company's investment license for the Kasumbalesa project, in the tune of over **USD25 million** in 2010. This was the initial estimated cost (Chamba, 2015; ZNBC, 2015).

Furthermore, in recognition of Z(ip)BCC's management track record as well as the company's' qualification towards the successful implementation of the project, Development Bank of Southern Africa (DBSA) in 2009 approved a facility loan, to the Kasumbalesa Project. The other funding was sourced from the shareholders. However, the actual financial expenditures



were not known due to the way the project was closed. This project was highly politically influenced (Chazingwa, 2015).

#### **6.3.5 Process analysis**

According to ZDA (2010), the project was facilitated by the Government of Zambia who provided the land on which the project was executed. The detailed Agreement between the Government of Zambia and the Concessionaire was duly signed on 1st July 2009. The Project was certified by the Zambian Investment Center on 29th August 2009 and in the same time the Environmental license was issued by the Environmental Council of Zambia. The PPP Unit under Ministry of Finance and National Planning prepared all documentation relating to this project.

#### **6.3.6 Post facto Vfm analysis**

The economic benefits of this project have translated into high volumes of traffic being handled daily. The country has received tremendous inflow of foreign investment which has put the border as a good investment (Chambwa, 2015).

#### **6.3.7 Key learning and objectives**

According to Zipbcc (2010), the overall project benefits included the following;

- i. Increased collection of revenue by government;
- ii. Improved traffic flow throughout the region for the benefit of all regional countries;
- iii. Improved monitoring and collection of customs duty and other fees;
- iv. Shortening of the crossing time, as per SADC Protocol of Transport;
- v. Shorter transit times for truck hauler companies, thus better fleet utilization ratio.
- vi. Shorter credit time granted by the mining companies for copper and cobalt; and
- vii. Access to secure environment and state of the art facilities.

The challenges faced by this project included; political interference (Chazingwa, 2015); lack of an analysis of all risk dependent factors (Chambwa, 2015); and low involvement of the local stakeholders (Chazingwa, 2015).

## **6.4 Case study: Cha Cha Cha Market Project**

### **6.4.1 Project description**

Lusaka City Council (2009) initiated a project to improve the central business district town centre market called Cha Cha Cha. The council had been looking for ways and means of involving the private sector in partnering in the development of the city. The development of Cha Cha Cha Market was achieved through a Public Private Partnership where various stakeholders were involved. This project has been chosen as a case study as it is of a sizeable scale that can address various issues in the study. This project which was completed in 2001 has many lessons to offer to this study which will help shape the future PPP projects (ZDA, 2010)

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Additionally, the project has gone through various political governance systems since 2002, where the study can draw the flaws and achievements. The case studies will also address how the challenges of PPP agreements have been addressed in Zambia.

### **6.4.2 PPP structure of the project**

The Cha Cha Cha Market Project was the first project in the local governance sector to be taken through the Public Private Partnership route in Zambia. The construction of the market structure in Lusaka city, involving the demolition of unplanned structure, construction of a new market and related services, was done on a BOT (Build, Operate and Transfer) basis. Besides the construction responsibility, the contractor was also required to undertake the operation and maintenance of the market for a period of 60 years from the date of completion of the construction, on a fixed fee basis. The collection of tariff and provision of new connections during the operation and maintenance phase was to be undertaken by the city council directly (LCC, 2009).

Accordingly, the PPP structure of this complex project was governed by unsolicited bids from three interested bidders and was awarded to one engineering, procurement, and construction (EPC) contractor selected through a competitive bidding process. The selected contractor would operate and maintain the market for a period of sixty-five years (Ibid, 2009)

A Lease Contract (in the nature of a BOT Agreement) was entered into. Through this Agreement, the contractor would finance, build and operate the market for a period as proposed in the contractor's successful bid. The contractor would be required to recover the investment on the project on the basis of a per unit rate payment from big shops only. The council agreed to collect a minimum payment of levy from the small stalls. It was designed to cover the company's minimum fixed operating cost and capital investment. Accordingly, the PPP structure was technically in the nature of BOT-Annuity (Chamba, 2015).

Following the bid process, the project was awarded to United Engineering Group to design the market, supply, install and commission the structures. It was also to carry out a contract for operating and maintaining the facility for 65 years (LCC, 2009).

#### **6.4.3 Status quo**

The first phase of construction works were completed in 1999. The number of shops that was built was 50 around the perimeter of the market with 250 mini kiosks were erected within the market. According to the agreement, the market is supposed to be maintained by the developer until the lease expires after 60 years. The lease agreement is valid until the year 2062 (Ibid, 2009).

#### **6.4.4 Financial information**

Initially, the cost of the project was estimated to be K2.5 billion, of which the final figure was higher than that the budgeted. The costs escalated due to the delays by LCC to marketeers from the site. The financing of the project was 100 percent done by the private investor. No other aspects of project funding were involved in this project. The city council targeted to provide about 300 kiosks within the Central Business District by the end of 2002 (Chamba, 2015). It

was agreed that the concessionaire was to collect the rentals from the 50 kiosks while the City Council was to collect levy from the 250 mini kiosks over the concession period (LCC, 2009).

#### **6.4.5 Process analysis**

**(a) Inception:** LCC advertised the tender for the market project on 26<sup>th</sup> August 1999 in the public media. The Plans, Works and Development Committee shortlisted two of the three responsive bidders. Mickmar Investments and United Engineering Group were the shortlisted bidders in the PWDC meeting on 31<sup>st</sup> March 2000. On 4<sup>th</sup> April 2000, the two bidders were interviewed after which a recommendation was done. The recommendation from PWDC was adopted by the full council after which a formal contract award was done to United Engineering Group on 12<sup>th</sup> April 2012. Immediately after award, the project took off within the month (LCC, 2009).

#### **(b) PPP Project Preparation:**

As the first step, LCC was supposed to ensure that all the stakeholders were engaged. The marketeers formed a consultative committee that worked hand-in hand with LCC. This committee was meant to help marketeers in vacating the market construction site. Unfortunately, there was a delay on LCC's side on vacating the marketeers off site which impacted the commencement of the project. The objective of the project was to provide a modern market infrastructure within the CBD. LCC offered a piece of land and while the developer financed the project (Ibid, 2009). The agreement was similar to the Luburma market arrangement where LCC did not have prior experience in running such PPP/BOT projects. All the output specifications were handled by the developer.

#### **(c) Procurement:**

The project was structured such that an engineering, procurement and construction contractor, selected through competitive bidding process, would design and implement the market system, on turnkey works contract, and would also finance, design, build, and operate on PPP/BOT basis (Mukela, 2009). The procurement of private contractor for the execution of the project was

carried out without specific guidelines. Lusaka City Council did not formulate any output specifications as the private developer was given a leeway to come with output expectations. A one stage bid process was adopted - a technical proposal combined with a financial proposal (ZDA, 2010).

The technical capabilities of the contractors and their experience in similar works were given importance. Of the three bidders who submitted the bids, one was selected and the financial proposals were considered at the same time. As per the financial evaluation criteria, the bidder quoting the lowest best cost for the development of the market with a reason lease term was selected as the final, successful contractor (Ibid, 2009). Based on the evaluation of the proposals and on the recommendations of committee, the project was awarded to United Engineering Group in 2000 for a lease period of 60 years.

**(e) Implementation:** As per the Agreement, the expected date of completion was 31st March, 2002. In order to ensure timely implementation of the project and adherence to quality specifications, a supervisory committee was set up by LCC. Unfortunately, this committee did not conduct project monitoring except the timed inspections. Furthermore, no private or any government consultants were engaged to monitor the project delivery process. The developer managed the construction process with total control (LCC, 2009; ZDA, 2010).

**(f) Delivery:** The project work was carried out in a single phase. In this phase, the construction process was executed from inception to completion. By the end of the construction works, a modern market was completed. The main objective of providing a modern market was accomplished by the time the project was handed over. The project works were completed in 2002 (LCC, 2009).

**(g) Exit:** The contract for the operations and management of the market is expiring in 2067, after the stipulated contract period of 60 years. After expiration of the lease period, the operation and management function will reverted to the municipality. (Chamba, 2015). It was understood that the contract agreement had not worked well due to the poor arrangement, lack of contract monitoring and output specifications. The agreement which was meant to be reviewed every 10 years had never been reviewed since implementation (LCC, 2009).

#### **6.4.6 Post facto Value for Money (VfM) analysis**

No value for money analysis had been revealed from the available documents on this project. LCC did not work out any financial implications in terms of value addition, making it a pure social project. As a result, the project had not materialized any much value to the economy especially with the longer concession period (Nkana, 2015). Political interference which dictated the concession period and other factors made it hard for LCC to explore the best way to implement this PPP construction project. As much as there were benefits socially, the concession is a financial loss in the absence of proper management records (Chazingwa, 2015; ZDA, 2009).

#### **6.4.7 Key learning and objectives**

**6.4.7.1 Lease Agreement for 60 years:** The period of lease for the infrastructure was too long. By the time the developer would be handing over the property, its value would have been lost. The infrastructure would be another eye sole without value, making the whole venture a huge cost to the council. The concession period as stipulated in the PPP Act of 2009 of Zambian laws should run to a maximum period of 30 years. The current 60 years was not profitable (Chamba, 2015; Nkana, 2015)).

**6.4.7.2 Technical Advisory:** There was no involvement of specialized local and foreign technical advisors. LCC did not have trained officers capable of handling PPP construction projects. This impacted on the level of monitoring that was given. Though a PPP construction project, the client indirectly assumed all the risks since the private developer had all the control. Risk sharing was not done equally. Chamba (2015) argues that in the absence of technical expertise, there were no output specifications that were given to the developer. Financial calculation on value for money could not be traced.

**6.4.7.3 Property Maintenance:** Though the Agreement stipulated that the developer was to maintain the property within 60 years, little maintenance works were being done. This could be seen from the state of the structures and the complaints from the marketeers (Nkana, 2015). Most structure were wearing out.

**6.4.7.4 Contract Reviews:** The agreement to review the contract every 5 years had not been effective to sour relationship between Lusaka City Council and the private investor (Kwatu 2015; Chamba, 2015; LCC, 2009).

**6.4.7.5 Political will:** The project had suffered a lot of political interference from the governments of the day. This impacted the decisions LCC made as the ruling governments would interfere with the running of the biggest municipality in the country. There had not been strong political will to monitor the project in the absence of an independent municipality (Nkana, 2015; Chamba, 2015).

## **6.5 Summary**

Case studies of PPP construction projects executed in Zambia were presented in this chapter. The structure of PPP agreements, deliverables, technical clauses and key lessons from these case studies were discussed. Lessons from literature review, data collected and case studies was used to develop a model in chapter Seven.

## **CHAPTER SEVEN: A MODEL FOR PLANNING, IMPLEMENTING AND MONITORING PPP CONSTRUCTION PROJECTS**

### **7.0 Introduction**

In the previous chapter, three case studies procured via PPPs were presented and discussed. This chapter presents and discusses a proposed improvements to the existing model for PPP construction projects developed during the course of this study. The model development was based on the need to have a tool that is simple, easy, comprehensible and adaptable to both public and private sectors.

### **7.1 PPP model for construction projects**

The improvement of the PPP model was based on the findings from literature review, data analysis and discussion of results that identified the need for tools to help deliver construction projects successfully. The proposed PPP model would also enhance planning, implementation and monitoring of PPP construction projects. The model utilized the PPP Act No. 14 of 2009 of the Laws of Zambia to identify possible missing links and further define processes that would be used to implement PPP projects; clarify the complexity of the causal-interrelationships within a PPP arrangement; and suggest direction for future studies.

#### **7.1.1 Development of the PPP model**

The PPP Model was based on systems theory developed in the 1950s. The model adopts the systems thinking viewpoint, where role players are supposed to see the broader picture of ongoing, reciprocal relationships (Andrew, 1999), which a PPP project may be exhibiting. One of the core impediments to the systems thinking approach in PPP processes is lack of project management expertise. The model proposes to encapsulate a fully-fledged role of a qualified project manager, complete with an integrated project management system in the delivery processes.



The model was constructed with the aim of defining processes for project implementation and management of end-user inputs over the entire project life cycle. The model adapts a visual graphical method of demonstrating relationships between project resources, activities, outputs, and outcomes. It could be used as a planning, implementation and monitoring tool that a project would employ to conduct activities that are intended to produce specific, describable, and measurable changes or results in organizations, or the broader physical and social environment.

The information gathered through literature review, interviews and the questionnaire surveys was analyzed to provide the basis for proposals to improve and effectively plan, monitor and implement PPP construction projects through the use of a model. In preparing the PPP model, the flow chart approach was found suitable. A flow chart is easy to understand and explain relationships, showing how steps in a process fit together. This make it a useful tool for communicating how processes relate to each other, and for clearly documenting how a particular function is performed.

#### **7.1.2 The need for a PPP model**

A model can be a useful tool to demonstrate integrated, systemic planning in relation to the achievement of goals and expected outcomes. Often a PPP project proposal may not clearly specify the relationship shared among resources, planned activities and outputs, and the benefits expected from the PPP project. The model helps to crystallize the extent to which the PPP project can make a difference.

The graphic features of the model serve to depict relationships among components of a PPP project. A model provides a common vocabulary to describe elements of project work in a way that encourages deeper understanding over a variety of projects. Once internalized within the PPP sector, this approach will transform the mindset of PPP managers in the way of solving PPP related problems.

According to McNamara (2006), modeling is a tool that helps to organize relationships between major project activities and anticipated outcomes. It can be effective in planning a PPP project design, implementing activities, and evaluating project success. It should be noted that while a PPP model demonstrates the relationships shared by project elements such as expected results, changes, or effects derived through project activities, it does not take the place of performance indicators within a PPP project context. Relevant performance indicators or criteria must still be developed for each specific PPP project. The existing generic PPP model is shown in Figure 7.1.

Relevant evaluation questions, targeted data sources, and collection strategies are essential elements of a PPP project's ongoing continuous quality assurance and improvement. It is acknowledged that models are not static; hence there will be need for continuous review and improvement.

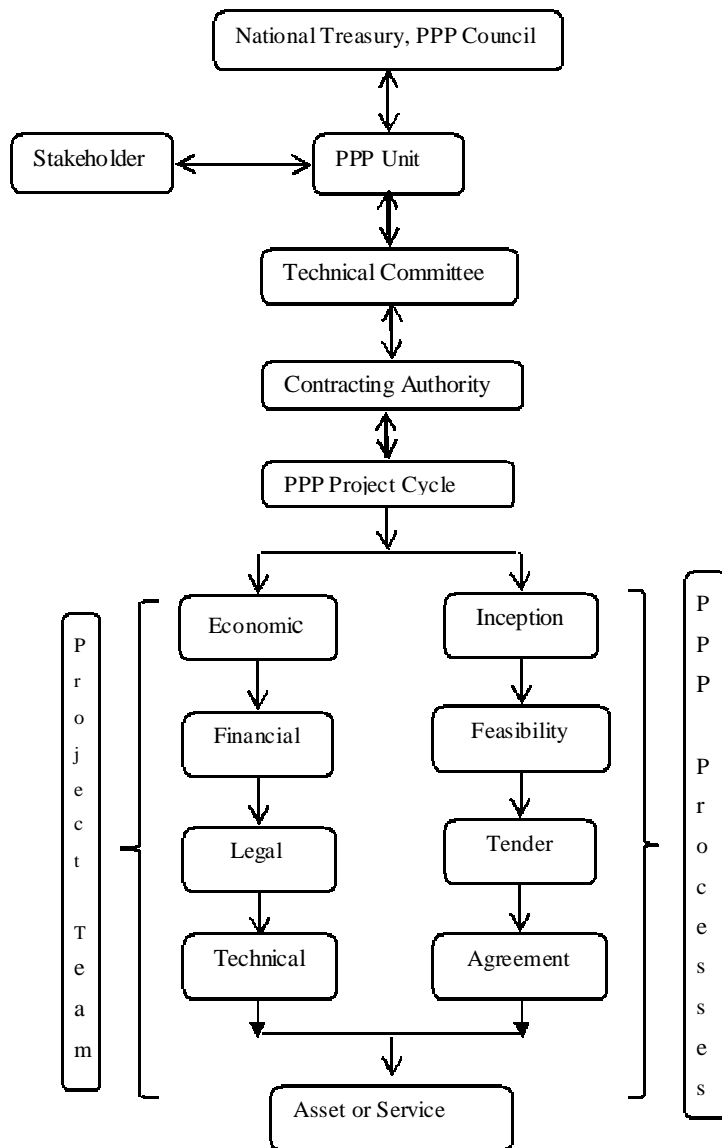
### **7.1.3 Shortcomings of existing PPP model**

Act No. 14 of 2009 present a generic project life cycle for national guidance when procuring PPP construction projects. According to the Act, only the contracting authority of an institution may enter into a PPP agreement on behalf of that institution. Clause 38.3 states that “a contracting authority shall not award any project or sign any agreement unless the award of the project has been approved by the PPP Unit; and agreement relating to the project has been approved by the PPP Council.”

This policy direction for the implementation does not provide for project management competency levels required for the contracting authority responsible for executing PPP projects. Furthermore, it does not give consideration for the appointment of the project political champion, manager, auditor and the establishment of the project management office. PPP education and training has also not been supported by the policy, making it difficult for research support institutions to appreciate it.

While there are shortcomings, it is also important to appreciate the existing model as it has

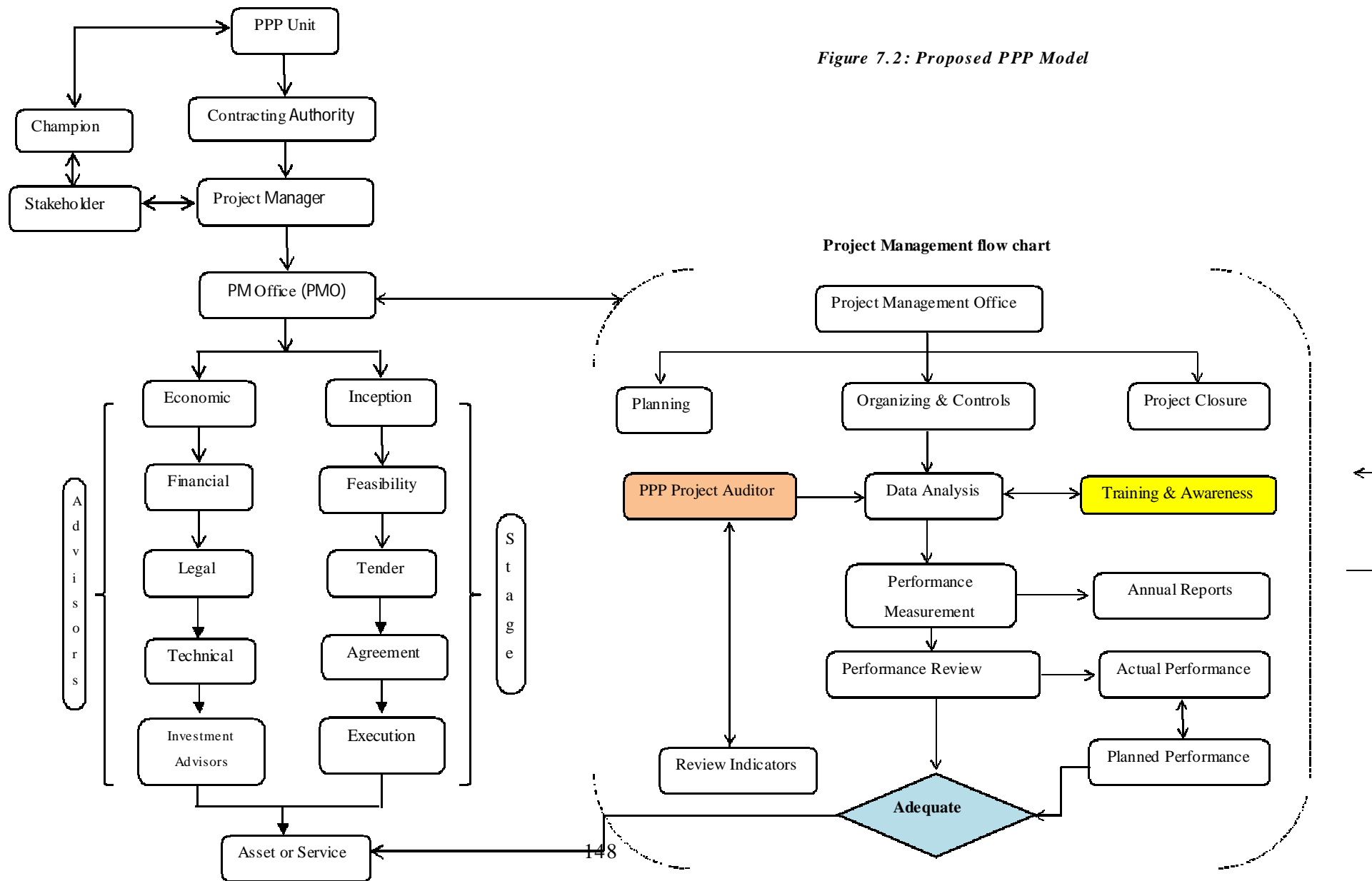
provided a basic guideline in the execution of PPP construction projects.



**Figure 7.1: Existing generic PPP Model**  
(After PPP Act of 2009, Zambia)

## 7.2 Improvement of PPP model

The forgoing issues constitute the missing link in the existing model. The improvement of the PPP model was intended to fill the gap of missing areas. The proposed improvements consists of the identified additions besides the generic ones as depicted in Figure 7.2.



### ***7.2.1 Stakeholders***

Stakeholders being parties that have interest in the PPP construction project shall be involved throughout the execution of the works. Initially, they will be coordinated by the project champion until when the project commences where they will work with the project manager during the project life cycle.

### ***7.2.2 The champion***

The function of the champion is targeted to be at the chief executive level of a local authority or member of PPP unit and will provide input towards political support and broader stakeholder consultation relative to the PPP procurement. This role should be seen as a unique active role as opposed to the passive generic role of politicians, when it comes to implementation of projects of this nature.

### ***7.2.3 The PPP Unit***

The PPP unit shall be established to review the PPP policy and coordinate all projects at national level. The unit shall provide guidance and review policies to ensure that a good investment platform is established. The mandate of the unit shall end at engaging stakeholders through political champions in ensuring that all areas are considered before the project can commence. The unit shall represent the interest of the private and public partners in ensuring that both parties are agreeable. Once a project has been identified, the unit should engage a contracting authority who may be a municipal council or ministry to further establish the project team.

### ***7.2.4 The Contracting Authority***

The contracting authority shall be a government ministry, provincial governance wings or local authority that may directly benefit from the PPP agreement. Other than using a national PPP unit as has been the case, authority must be decentralized to lower organs to manage the PPP processes. The government wings should be given capacity to

engage in PPP projects. Therefore, there is an urgent need to build capacity within the municipalities and other implementing agencies so as to facilitate service delivery and meet strict deadlines for completion of facilities and infrastructure (Nyagwashi et al, 2009).

#### ***7.2.5 The PPP project manager***

The project manager should be appointed by the council to coordinate activities. This personnel should be qualified in construction industry with adequate experience in PPP construction projects. Furthermore, the office bearer should be able to translate technical documents including architectural drawings, bills of quantities, mechanical and electrical layouts.

This should be a well-rounded and experienced person in PPP construction project policies, procedures and processes. The PPP project manager's principal responsibility should be to deliver the project end-item, the asset or service within specified objectives or level of investment, schedule and risk allocation. Though responsibilities are likely to vary, they would usually include: planning, organizing and controlling project resources; selecting and organizing the project team; interfacing with stakeholders, monitoring project status, identifying technical and functional problems, solving problems and closing the project. The PPP project manager would establish a fully functional institutional framework consisting of a project support office, staff and relevant infrastructure. He would have clearly defined roles and tacit authority to manage the PPP process from inception to closure or PPP agreement during the development phase.

#### ***7.2.6 Project Management Office (PMO)***

The project management team should establish a system that would effectively manage the PPP construction processes and resources. This system should be focused on asset or service delivery and should be easy to be used by all parties. It should also be used to measure key performance indicators and milestones during project execution.

Furthermore, the PMO should establish an organization structure, information processing procedures, standards and procedures for the project.

#### ***7.2.7 Project Management Processes***

##### ***(a) Inception and Planning***

The PPP management office should adequately prepare and plan for the project by clearly establishing the scope and objectives.

##### ***(b) Organization and Controlling***

There should be an establishment of how the project processes should be organized and controlled.

##### ***(c) Data analysis***

Data collected during project execution should be analyzed to help generate recommendations for upcoming stages or projects. In order to enhance performance, there should be transparency in sharing information by all stakeholders. This will enable decision makers to improve project delivery at all levels.

##### ***(d) Training and awareness***

Research into how PPPs can be effectively delivered should be an on-going process as events evolve. Research and education centers like universities should be engaged in the provision of training and awareness on various issues affecting PPP construction projects.

##### ***(e) Performance Measurement***

The project auditor shall measure the performance of the contractor based on the project management plan, which stipulates the workload. An annual report should be generated to highlight the lessons learnt and the areas improvements. These highlights can be availed to the research institutions for further review.

***(f) Performance Review***

At this stage, the project auditor should review consultants' pro-activity, control and approval procedures on the project. Assessment of the consultants' performance in terms of adequacy of materials tests recommended, qualifications of consultants' staff, site communication and reporting procedures, knowledge of the contract, quality of work completed, consultants' progress reports, and general attitude of the consultant towards the project should be performed. The review shall compare the planned against the actual performance.

***(g) Asset or service***

At this stage, an asset or service is expected to be delivered or provided. The asset or service is to the benefit of the end-users.

***(h) Review of indicators***

Where indicators have shown grey areas, there is need to establish root causes as well as come up with mitigation measures. The PPP monitor or auditor should be on the lookout for indicators of failure to effectively delivery processes and activities.

***(i) PPP project monitor or auditor***

The PPP project monitor or auditor should establish and administer project monitoring procedures during contract negotiations and implement them during operation to ensure fulfillment of quality related requirements for the asset or service. The overall responsibilities encompass raising awareness of quality and instituting means for improving PPP operations to meet desired goals.

***7.2.8 Project Advisory***

The project management team has to ensure that consultants who possess skills that are necessary to meet needs of the project should be appointed. Signed contracts for each consultant should be available and the project manager should verify that contracts include mandatory clauses such as the main responsibilities of parties, duration of the contract, quality of service, payment terms, compensation events, rights to materials, indemnity, insurance and liability conditions and rules of termination (ICE, 2005).



#### ***7.2.8.1 Economic advisory***

The economic advisors should provide guidance on the economic benefits to the public that the proposed project will provide. It includes the quantification and identification of all benefits expected. They should advise based on the behavior of the economic indicators that could affect the business environment. Where necessary, changes can be made on the project scope based on the obtaining or anticipated environment.

#### ***7.2.8.2 Financial advisory***

Financial advisors should establish the financial viability of a project. Advisors should establish the rate of financial benefit to the partners, repayment periods and terms, project funding potential, and sensitivity in the repayment capability due to time delays, mild slowing of sales, acute reduction of sales, large increase in cost and adverse economic conditions (Bentley and Whitten, 2007).

#### ***7.2.8.3 Legal advisory***

In order for a PPP construction project to be successful, there is need to have a strong legal framework. There is need to protect the interest of both parties legally. Legal advisors should provide guidance in the administration of the contract throughout the execution process. Institutions that handle matters related to legislation should be engaged. These institutions should ensure that the controls are strictly implemented in order to reduce challenges in the delivery of the asset or service. The advisors should also ensure that the project complies with legal requirements at every stage.

#### ***7.2.8.4 Technical advisory***

Qualified technical personnel should be engaged to provide technical advice in the administration of the construction process. The technical advisors should focus on understanding the present technical resources of the partners and their applicability to the expected needs of the proposed project.

#### ***7.2.9 Project Cycle***

A typical project cycle shall include the following:

#### ***7.2.9.1 Inception***

Every PPP construction project should have a clear scope and objectives. The PPP team should also understand the key components, assess the feasibility and establish the cost estimates associated with the project. There should be a balance of the competing priorities in order to maximize stakeholder value. The purpose of this stage is to achieve concurrence among all stakeholders on the lifecycle objectives for the project.

#### ***7.2.9.2 Feasibility***

After inception stage, the PPP team should assess the business value of the proposed venture. This will include the establishment of the cost to be involved and the value to be attained. At this stage, the project's potential for success should be evaluated. It must therefore be conducted with an objective, unbiased approach to provide information upon which decisions can be based.

#### ***7.2.9.3 Tendering***

The project management team should ensure that all tender documentation is relevant, accurate, comprehensive and timely. A review of the bid invitation procedure should be done to ensure that a competitive tender field was established. The content of the tender dossiers will vary but the following key documents will generally be required as a minimum: Instruction to Bidders; Conditions of Tendering; Form of Tender; Conditions of Contract; Specifications; Schedules or Bills of Quantities; Drawings and samples of forms for bid security, performance bond guarantees, advance payment guarantees and retention.

Verification that bids were analyzed against the criteria for selection defined in the tender documents should be undertaken. The tender should be verified in terms of contract price after corrections, construction period, innovation of the bidder with regards to work execution methods and conformity to bid requirements. The capability of the contractor should be evaluated in relation to previous experience on similar works, financial resources, managerial and personnel resources, technical resources,

current workload, dispute resolution records, quality assurance systems, environmental compliance records, industrial relations records and occupational, health and safety, and rehabilitation records.

#### ***7.2.9.4 Agreement***

The project management team should review the bid evaluation report which summarizes the methodology undertaken and final recommendations, stating the reasons for selection. Treatment of unsuccessful bidders such as whether a debriefing meeting was held should be considered. The team should ensure that all the terms and conditions of the contract are clear, effective and relevant to the scope of works. An opportunity for fraudulent practices may arise from misinterpretations of prescribed terms and conditions. Negotiation documents that formed the basis of the award of the contract should be included in the contract package. Finally, the project manager should ensure that original contract documents are stamped and kept in safe custody.

#### ***7.2.10 PPP Training and Awareness***

The solution of PPP related problems in Zambia and the SADC requires a mindset change by PPP actors from “traditional” thinking to “systemic” thinking. The problems must be viewed from a broader real world context. PPP actors must create learning organizations to view issues from a systems perspective or viewpoint. System thinking employs the concept of a system: an organized whole in which parts are related. By continuous training and creating awareness, the model would contribute to the creation of a PPP friendly environment that is supportive of the whole process. The slow flow of PPP projects was due to several factors, both internal and external to the PPP delivery system, which includes lack of modeling of risks (Wibowo and Patria, 2007).

The model functions are performed in parallel and are iterative. The PPP model in Figure 7.2 provided for the missing link in the PPP Act of 2009. The model encapsulates a fully-fledged role of a qualified project manager, complete with an integrated project management system in the delivery processes.

### **7.3 Summary**

The development of the PPP model was presented in this chapter. Missing actors in the existing model were identified and placed appropriately. The next chapter presents limitations, conclusion and recommendations of the study.

## **CHAPTER 8: CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS**

### **8.1 Introduction**

In the previous chapter, a PPP model was developed and validated by construction industry professionals. This chapter presents the conclusions drawn from the analysis of results from the questionnaire survey, structured interviews, case studies and the model validation exercise. In addition, it presents recommendations directed at improving project delivery using PPP model in the Zambian construction industry and elsewhere in the world. It further highlights limitations regarding the study and opportunities for further research.

The aim of the research was to develop a project management model to be used in the implementation of construction projects in Zambia. This was achieved by developing a best practice model incorporating standard checklists to ensure that all relevant aspects of a project in each stage of the implementation were considered. The checklists would prevent overlooking any critical aspect in construction thereby reducing cost escalation, schedule overruns and quality shortfalls that could have adverse delivery implications.

### **8.2 Conclusions**

Cost escalation, schedule overruns and quality shortfalls in construction projects are potential obstacles to project success. Hence the Zambian Government embarked on structural reforms such as the introduction of PPPs as a model to enhance project procurement and delivery. Despite the introduction of PPP, constraints and risks to its implementation still persisted, thereby challenging the delivery of construction projects.

Constraint and risk factors in the implementation of public sector infrastructure through PPPs were identified. The study established that: lack of appropriate legislation, lengthy concession agreements, lack of toll or user fee-setting policies, excessive rates of return to private investors, absence of revenue-sharing formulae, inconsistent application of evaluation tools, such as value-for-money and cost-benefit analysis, poor terms in

relation to the condition of assets at the end of the concession and poor risk allocation between public and private sector; were the eight most prevalent constraints to the implementation of PPP construction projects. Stakeholder project approval, corruption, inflation, environmental considerations and lack of experience in PPP arrangement were the five most prevalent risks in the implementation of PPP construction projects in Zambia.

Using Mann Whitney U test and a Spearman rank correlation coefficient test, the levels of agreement between the public and private sector respondents on their ranking of constraints and risks in the implementation of PPP projects in Zambia were measured. Based on the interpretation, the constraint and risk factors had over a 75% chance of inhibiting project delivery.

The specific objectives of the study were attained through the following conclusions:

- a) Factors which led to poor delivery of public sector infrastructure were established;
- b) Ways of dealing with the identified factors using PPPs were discussed;
- c) Benefits, opportunities and challenges of using PPPs were identified; and
- d) An improvement to the existing PPP model was developed.

### **8.3 Recommendations**

In order to successfully address challenges affecting the delivery of public sector infrastructure using PPPs, the risks and constraints must be well understood and attended to. Project planning, implementation and monitoring tools such as performance management, review, reporting, auditing and risk assessors need to be utilized in order to achieve successful outcomes.

#### **8.3.1 General recommendations**

The results of this study reported could help PPP project implementers carefully plan, monitor and manage projects by looking out especially for factors with high constraint and risk ratings.

To effectively deal with the lack of appropriate legislation, there is need to put up coherent laws that lay down clear objectives and principles, identify projects, and set realistic targets and means of achieving them, with the overall aim of attracting the private sector to invest in PPP projects. Investors in PPPs need predictability and security embedded in fewer, simpler and better defined laws. Such laws should be backed by adequate initial analysis of costs, well defined scope of works to be executed, clear project durations, and assured condition of assets at the end of the concession.

The adequacy and completeness of laws alone would not be enough. There is need to develop capacity in the various technical aspects of PPP design and implementation at different government levels. This should be enhanced by building the necessary capacities in public institutions that included training public officials in PPPs. Training should provide personnel in public institutions with requisite expertise to deal with various projects with different complexities. Public sector personnel should ensure that the selection process of bidders for PPP projects is transparent, neutral, and non-discriminatory and promotes competition while striking a balance between the need to reduce the length of time and cost of the bidding process.

Risk management in the implementation of PPP construction projects was noted to be equally imperative. Practitioners should endeavor to develop appropriate risk management structures specific to local environment. Risk management strategies should include contractual clauses that allow for balanced risk sharing. The public needs to accept its share of risks and help to mitigate those allocated to the private sector. This can only be achieved if there is a transparent procurement process where decisions made are based on clear and fair evaluation criteria.

Relevant regulatory and higher learning institutions such as National Council for Construction (NCC), universities and other bodies should also consider incorporating PPPs in their curricula for construction related academic and professional programs. This would help expand the knowledge base and widen opportunities for private investors to engage in public sector projects.

Detailed customized structures, financial instruments, contracts and special purpose vehicles meeting specific requirements for each PPP should be developed because each project is unique. There is, therefore, need to continuously improve PPP policies and research into how the PPP procurement approach could be best implemented in Zambia and other countries, both developed and developing.

### **8.3.2 Specific recommendations**

The following specific recommendations should be considered:

- i. The PPP model could be further explored and adopted into the PPP Act as a national guideline for implementers and decision makers in construction projects;
- ii. Planning, implementation and monitoring tools could be adopted throughout the entire project life cycle; and
- iii. Training institutions providing construction-related programs should consider introducing Public Private Partnerships as part of their curricula.

Although this study provided valuable insights, the findings were based on the Zambian experience. Other studies are needed to investigate the challenges that bedevil other countries, especially those in the developing world.

## **8.4 Limitations**

This study should be considered with some limitations as it focused on construction projects from a view at national level. The findings might vary from a construction project controlled by the PPP unit at national level to that of a municipal level. However, the basic principles certainly encompass all scales of PPP involvement.

The results also reflect situations that would be present in large scale PPP construction projects. Small scale PPP construction projects might have other challenges that are different from the ones highlighted in this study.



Furthermore, the proposed PPP model presents casual relationships between major project activities and anticipated outcomes. The PPP model does not take the place of performance indicators within a PPP project context. Relevant performance indicators or criteria must be developed for each specific PPP construction project.

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## **APPENDICES**

## ***APPENDIX 1***

### ***Publications from the dissertation***

#### **Published Journal Articles**

1. **Ngoma S., Kaliba C.,** and Muya M., (2014), *Benefits, constraints and risks in infrastructure development via Public Private Partnerships in Zambia*, Journal of Construction in Developing Countries. Vol. 19, No. 1, pp 15 – 33. Available online: [www.jcdc.com](http://www.jcdc.com).

#### **Conference Proceedings**

1. **Ngoma S., Muya M.,** and Kaliba C., (2010) *Delivery of public sector infrastructure through Public Private Partnerships: an opportunity for Zambiaa*, The Engineering Institution of Zambia National Symposium, Livingstone, 27-28 August, EIZ.

## APPENDIX 2

### *Structured Interview Questions*

The purpose of this interview is to obtain your views on benefits of, concerns on and how Public Private Partnerships (PPPs) affect project performance, budget and delivery.

- Kindly note that the answers should be based on your experience regarding construction projects;
- All information provided will be treated in strict confidence.

#### **Section 1: Personal Information**

- 1.1 Name of interviewee:.....
- 1.2 Name of organization:.....
- 1.3 Interviewee's position in the firm:.....
- 1.4 What type of organization do you work?.....

#### **Section 2: Experience on Public-Private Partnerships construction projects**

2.1 For how long has your organization been involved in public-private partnership construction projects? \_\_\_\_\_

2.2 What forms or types of PPPs has your organization been involved in, directly or indirectly, so far?

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2.3 In your view, what has been the impact so far of using PPPs on construction projects?

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#### **Section 3: Infrastructure provision via Public-Private Partnerships**

3.1 The tradition procurement method has faced challenges in addressing poor performance, over expenditure and schedule overrun on construction projects. How have PPPs addressed these challenges in infrastructure provision?

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3.2 From your perspective, what do you see as the top benefits of PPPs in delivering public sector infrastructure?

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3.3 What are the potential risks that exist in PPPs in construction projects?

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3.4 What are the main concerns or challenges affecting PPPs and how can each of these concerns be mitigated?

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3.5 What opportunities are available in construction projects that could favour PPPs?

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3.6 What are the most important or key factors that decision makers in Zambia should consider with respect to creating successful PPPs?

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3.7 In your view, what is the future of PPPs in Zambia?

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3.8 With reference to PPP construction projects, what other views do you have about?

(a) Poor performance:

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(b) Over expenditure:

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(c) Schedule overruns

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Thank you for sparing your time in this interview.

## APPENDIX 3

### Cover letter to the questionnaire



The University of Zambia  
School of Engineering  
P.O Box 32379, Lusaka.

Mob: 0978773844; E-mail: [sydnngoma@yahoo.co.uk](mailto:sydnngoma@yahoo.co.uk)

---

21 April 2011.

Dear respondent,

I am a research student at the University of Zambia pursuing a Master of Engineering Degree in Construction Management. In fulfillment of the dissertation requirements, I am conducting a research on **“The delivery of public sector infrastructure through Public Private Partnerships: A case of Zambia Construction Industry.”**

The purpose of this study is to assess the performance of Public-Private Partnerships in construction projects and find ways or mechanisms that can be employed to promote the effective project delivery of public sector infrastructure projects in Zambia.

I request that you help me with information about how your company/organization deals with Public Private Partnership projects. For the purpose of my dissertation, individual companies/organizations will be treated anonymously. I would be very grateful if you could take 5-10 minutes to complete the attached questionnaire and possibly send it back to me by email ([sydnngoma@gmail.com](mailto:sydnngoma@gmail.com)) by 30<sup>th</sup> May, 2011. Equally, a copy of the summary report will be available to the various companies/organization involved.

Thanking you in anticipation.

Yours faithfully,

**Sydney Ngoma (Master of Engineering Student)**

## APPENDIX 4

### QUESTIONNAIRE SURVEY

The purpose of this study is to measure the performance of Public-Private Partnerships in construction projects and find ways or mechanisms that can be employed to promote the effective project delivery of public sector infrastructure projects in Zambia.

#### A. Respondent's experience

1. Name of respondent: \_\_\_\_\_
2. Respondent's contact phone number: \_\_\_\_\_
3. Which organization do you work for? \_\_\_\_\_
4. What type of organization do you work for?
  - (a) Consultant: \_\_\_\_\_
  - (b) Government branch: \_\_\_\_\_
  - (c) Contractor: \_\_\_\_\_
  - (d) Other: \_\_\_\_\_
5. How long have you been dealing with PPP construction projects? *(Please tick)*
  - ? < 5 years
  - ? 5 – 10 years
  - ? 10 – 15 years
  - ? >15 years

#### B. Contractual arrangements

6. What types of Public-Private Partnerships have been considered in your agency? *(Tick all that apply)*
  - ☐ Design-Build
  - ☐ Build-Operate-Transfer (BOT)
  - ☐ Design - Build - Operate (DBO)
  - ☐ Build - Operate - Transfer (BOT)
  - ☐ Build - Own - Operate (BOO)
  - ☐ Build – Own – Lease (BOL)
  - ☐ Design – Build – Operate – Maintain (DBOM)
  - ☐ Build – Rent – Transfer (BRT)
  - ☐ Build – Transfer – Operate (BTO)
  - ☐ Rehabilitate – Operate – Transfer (ROT)
  - ☐ Service Contracts
  - ☐ Other (Please specify)

*If selected other, please specify:* \_\_\_\_\_



7. What contractual methods do you think best addresses poor performance, schedule overruns and over expenditure? *(Tick all that apply)*

- ☐ Design-Build
- ☐ Build-Operate-Transfer (BOT)
- ☐ Design - Build - Operate (DBO)
- ☐ Build - Operate - Transfer (BOT)
- ☐ Build - Own - Operate (BOO)
- ☐ Build – Own – Lease (BOL)
- ☐ Design – Build – Operate – Maintain (DBOM)
- ☐ Build – Rent – Transfer (BRT)
- ☐ Build – Transfer – Operate (BTO)
- ☐ Rehabilitate – Operate – Transfer (ROT)
- ☐ Service Contracts
- ☐ Other (Please specify)

*If selected other, please specify:* \_\_\_\_\_

#### **C. Impact of PPPs on construction projects**

8. On a scale of 1-5, with *1 being not at all* and *5 being a great deal*, rate the extent of the impact of PPPs on construction projects. *(Please tick)*

Impact		Level of extent of impact				
		1	2	3	4	5
a.	Reduction on the risk of handling					
b.	Improvement of levels of services					
c.	Provision of economic benefits					
d.	Saving on construction related costs					
e.	Increasing infrastructure provision					

#### **D. Perceptions on handling of challenges of using PPPs**

9. Overall, how does your organization perceive PPPs in construction projects?

i. Do they enhance the value for money? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

If yes, please elaborate\_\_\_\_\_

- ii. Do they provide infrastructure with better quality? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate how: \_\_\_\_\_

- iii. Are they competitive and do they aim at providing a long term product that would last longer? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate how: \_\_\_\_\_

- iv. Do they prevent budget overruns or cost escalation within a project? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate how: \_\_\_\_\_

- v. Do PPPs save on construction time or period? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate how: \_\_\_\_\_

- vi. Do they provide innovation in management and delivery of services? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate for each type of PPP if necessary \_\_\_\_\_

- vii. Do PPPs save on construction time or period? *(Please tick)*

**Yes ?                  No ?                  Don't Know ?**

Please elaborate how: \_\_\_\_\_

#### **E. Public concerns on implementation of PPP construction projects**

10. The following table lists some of the public concerns challenging the implementation process of PPP projects in Zambia. On a scale of 1-5, with *1 being not at all and 5 being a great deal*, rate the importance of each concern on PPPs on construction projects. *(Please tick)*

Public Concern	Level of Importance				
	1	2	3	4	5
Unclear/unavailability of criteria for selection of PPPs					
Considerations of alternative PPP models					
Availability and consistent application of evaluation tools, such as Value for Money and benefit-cost analysis					
Risk allocation between public and private sectors					
Potential excessive rates of return to private investors					
Relative roles of public and private sector					
Lack of public input opportunities through decision-making process					
Transparency and efficacy of the PPP process, including confidentiality, conflict of interest, intellectual property.					
Lack of time for appropriate legislative branch review or no legislative branch review					
Extent to which terms of agreement protect the public interest					
Liability, indemnification, insurance provisions					
Clauses that limit public ability to make competing improvements					
Revenue sharing formula					
Impacts on existing revenues					
Toll or user fee-setting policies (e.g., schedule of rate increases and indexing factors)					
Safety, enforcement and national security issues					
Environmental safeguards					
Asset control and ownership, including commercial development rights					
Terms related to condition of asset at end of concession					
Impact of project on alternative routes					
Trade agreement implications					
Length of agreement					

Type of Risk	Level of prevalence
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#### **F. Risks in PPP construction projects**

	1	2	3	4	5
Responsibility and risk distribution					
Financial capability of the consortium					
Effective communication between parties					
Lack of experience in PPP arrangement					
Level of acceptance by the society					
Political stability					
Corruption					
Project approval from the stakeholders					
Time overrun					
Cost overrun					
Quality issues					
Different working techniques between the parties					
Labor and Material shortage/strikes					
Problems with subcontractor management					
Construction productivity					
Fulfillment of services standard					
Lack of commitment					
Technological changes					
Regulation/Legal changes					
Environmental considerations					
Inflation					
Unresolved conflicts and disputes among parties involved or shareholders					
Maintainability of constructed facilities					
Social acceptance on the project					

11. Please rate the prevalence of the following risks which your agency experienced on PPPs.  
(Please tick)

#### **G. Future of PPPs in Zambia**

12. Please comment on the current and foreseeable trends in PPPs in the construction industry in Zambia?

\_\_\_\_\_

13. In your opinion, what techniques would improve the delivery of PPP construction projects in Zambia?

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14. In your opinion and based on the outcomes of your PPP project(s), what other benefits do PPPs present other than client confidence, enhanced accountability, reduced project delivery time, economic benefits, innovation and risk sharing? *(List them below)*

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Thank you so much for sparing your time in answering this questionnaire.

## APPENDIX 5

### Cover letter to the questionnaire on model validation



The University of Zambia  
School of Engineering  
Dept. of Civil & Environmental Engineering  
P.O Box 32379, Lusaka  
Mob: 0978773844; E-mail: [sydnngoma@yahoo.co.uk](mailto:sydnngoma@yahoo.co.uk)

---

1<sup>st</sup> March 2013.

Dear respondent,

Ref: Questionnaire Survey –Public Private Partnership Model validation

I am a research student at the University of Zambia pursuing a Master of Engineering Degree in Construction Management. I write to request that you complete the questionnaire meant for validation of the attached model. The model was developed through inputs gathered from various stakeholders in the Zambian construction industry in a survey conducted between March and June 2012.

The questionnaire should take a maximum of 10 minutes to complete and possibly be sent back to me through an email to [sydnngoma@gmail.com](mailto:sydnngoma@gmail.com) by 15<sup>th</sup> March, 2013. All information presented in this questionnaire will be treated with utmost confidentiality. I will be very grateful if you could find time to complete the questionnaire as soon as possible. Equally, a copy of the summary report will be available to the various companies/organization involved.

Thanking you in anticipation.

Yours faithfully,

Sydney Ngoma  
**MEng Research Student**

## Appendix 6

### QUESTIONNAIRE SURVEY ON VALIDATION OF PPP MODEL

The purpose of this study is to measure the performance of Public-Private Partnerships in construction projects and find ways or mechanisms that can be employed to promote the effective project delivery of public sector infrastructure projects in Zambia. This questionnaire validates the proposed PPP model.

#### Section A: General information on respondent and firm

1. Name of organization: \_\_\_\_\_
2. Position of respondent in organization: \_\_\_\_\_
4. Type of organization:
  - (a) Consultant: \_\_\_\_\_
  - (b) Government branch: \_\_\_\_\_
  - (c) Contractor: \_\_\_\_\_
  - (d) Other: \_\_\_\_\_
5. How long have you been dealing with PPP construction projects? *(Please tick)*
  - ? < 5 years
  - ? 5 – 10 years
  - ? 10 – 15 years
  - ? >15 years

#### Section B: Insights into the model

1. Overall, how do you perceive the following statements?
  - i. The model addresses the steps or actions necessary for planning, monitoring and implementing PPP construction projects. *(Please tick)*

<b>Agree ?</b>	<b>Neither agree or disagree ?</b>	<b>Disagree ?</b>
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  - ii. The proposed steps are easy to follow and implement. *(Please tick)*

<b>Agree ?</b>	<b>Neither agree or disagree ?</b>	<b>Disagree ?</b>
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- iii. The steps identified in the model can help in planning, monitoring and implementation of PPP construction projects. *(Please tick)*

**Agree ?**

**Neither agree or disagree ?**

**Disagree ?**

- iv. Would you be willing to use the PPP model in your construction projects? *(Please tick)*

**Yes ?**

**Not sure ?**

**No ?**

2. In your opinion and based on the outcomes of your PPP project(s), what other recommendations would you make that would render the model more responsive to industry needs? *(List them below)*

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Thank you so much for sparing your time in answering this questionnaire.