A BEST PRACTICE FRAMEWORK FOR PUBLIC-PRIVATE PARTNERSHIPS (PPPS) IN ROAD PROJECTS: THE CASE OF GHANA

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TABLE OF CONTENTS

List of Figures

List of Tables

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Now, to all my friends, work colleagues and siblings who supported me throughout this journey, I say thank you.

DEDICATION

I wish to dedicate this piece of research to my lovely wife,

Joyce Akosua Owusu Boadi and

our two adorable children,

Maame Djanwaa Boadi and **Nana Kwasi Boadi.**

While this PhD represents a personal accomplishment, it is an encouragement to the rest of my family, friends and work colleagues, with a similar background that with faith in God, commitment and perseverance to one's personal goals, nothing is impossible.

DECLARATION

I, Richard Boadi hereby declare that the research work, titled, **A Best Practice Framework for Public-Private Partnership (PPPs) in Road Projects**: **The Case of Ghana** is my work and that no portion of the work covered in this thesis has been submitted for the award of any academic degree of qualification.

Richard Boadi

Date: **24th August 2010**

LIST OF ABBREVIATIONS

AfDB	African Development Bank
DBO	Design-Build-Operate
DBOM	Design-Build-Operate-Maintain
DBFOM:	Design-Build-Finance-Operate-Maintain.
DBFOMT	Design-Build-Finance-Operate-Maintain-Transfer
BOT	Build-Operate-Transfer.
BOO	Build-Own-Operate.
BBO	Buy-Build-Operate
DFR	Department of Feeder Roads
DUR	Department of Urban Roads
DBB	Design Bid and Build
EIB	European Investment Bank
GDP	Gross Domestic Product
GNTP	Ghana National Transport Policy
GPP	Ghana Public- Private Partnership Bill
GIIA	Ghana Infrastructure Investment Fund
GHA	Ghana Highway Authority
GHS	Ghana Cedis
GNRSC	Ghana National Road Safety Commission
GSGDA	Ghana Shared Growth and Development Agenda
HM	Her Majesty

IBRD	International Bank for Reconstruction and Development
IMF	International Monitory Fund
LUL	London Underground Limited
MoFEP	Ministry of Finance and Economic Planning
MRH	Ministry of Roads and Highways
NPV	Net Present Value
NPPPD	National Policy on Public-Private Partnership Document
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PPA	Public Procurement ACT
PSC	Public Sector Comparator
PNDC	Provisional National Defence Council
PPI	Public-Private Initiative
PWC	Price Water House Coopers
RSMTDP	Road Sector Medium Term Development Plan
SPV	Special Purpose Vehicle
SPA	Structural Adjustment Program
SSA	Sub-Sahara Africa
UN	United Nations
UK	United Kingdom
USD	United State Dollar
VfM	Value for Money
AFC	Africa Finance Cooperation
TPP	Traditional Procurement Practice

ABSTRACT

Financing of public infrastructure projects in Ghana is predominantly from government-generated inflows. These funds are, however, inadequate to provide the infrastructure needed for the economic transformation and development of the country. The government of Ghana, as a forward-looking developing country, due to its desire to use PPPs to address the financial limitations and to bridge the infrastructure gaps of the country, launched the use of PPP in 2011. Since then, the roads sector has not received the required investment from the private sector, and this has affected road development in the country. Findings from existing literature indicate that some challenges prevent the private sector from investing in PPP road projects. Therefore, this study argues that identifying such challenges and develop a best practice framework that takes into consideration global best practice will create the necessary enabling environment for the private sector to invest in PPP road projects in Ghana.

This study adopts the philosophical stance of pragmatism and uses a sequential exploratory data collection technique to collect data. Data was collected from 250 survey respondents, where questionnaires were hand-delivered, sent via email and ten semi-structured interviews with industry practitioners, from the public and private sector. Thematic analysis was used to analyse the qualitative data. The quantitative data were analysed using a combination of descriptive statistics, mean ranking values, frequencies, standard deviation, Kendall's coefficient of concordance (W) and a Mann-Whitney U test (P) analysis. A reliability test conducted using SPSS software gave a Cronbach's Alpha value of 0.743, with 18 items, indicating a high responses reliability.

The research findings identified seventeen challenges that prevent the private sector from investing in PPP road projects in Ghana. Seventeen best practices were also identified from global best practice to address the challenges identified from the study. The empirical implication of this study is developed and validated best practice framework for PPP road project in Ghana. The validated framework presents the building blocks for creating the necessary enabling environment for private investors to invest in PPP road projects, particularly in Ghana. Therefore, the best practice framework will act as a reference point for countries with similar socio-cultural and economic conditions when an issue related to PPP road project arises. This study contributes by expanding the understanding of policymakers and PPP practitioners on the challenges preventing the private sector and knowledge on best practices relative to private sector investment in PPP road project, particularly in the Ghanaian road sector.

CHAPTER 1:INTRODUCTION

1.1 Chapter Introduction

This chapter explains the background of this study as well as the research problem and rationale for the study. It also explores the research questions, the aims and objectives of the research. Within this chapter, the research gap and the rationale for the research are discussed. There is also a section that briefly discusses the research methodology employed for this study; it explains how the research objectives were achieved. Finally, the chapter presents the structure of the thesis, the research process, and summarises the discussions of the chapter.

1.2 Research Background

Infrastructure plays a critical role in the socio-economic performance of a country, and its contribution to the growth of a national economy cannot be underestimated (Chotia and Rao, 2018). Infrastructure is vital in facilitating trade, enhance employment opportunities in both rural and urban areas, and it aids in wealth creation (Naazie et al. 2018). Current literature, theories, and empirical evidence provide a strong case for the recognition of infrastructure as an essential driver for economic growth (Mua, 2016; Barrie, 2011; Cui et al., 2018). The importance of infrastructure and its influence on sustainable development, socio-economic development, achieving economic prominence and reducing poverty of a country, has been a topical issue for discussion among researchers and commentators for many years (Estache and Wooden 2014; Estache et al. 2005; Foster 2008; Carranza et al. 2014).

Traditionally, funding for public infrastructure in many developed and developing countries, including Ghana, has come from the public coffers (Organisation for Economic Co-operation and Development [OECD] 2014; OECD 2014; World Bank 2015). However, due to budget constraints and pressure on governments to address other social necessities, governments of many countries are now looking to the private sector in their quest to address their infrastructure needs (Jordan–Tank 2017; Chou et al. 2012; Gbadegesin and Aluko 2014). The traditional method of financing infrastructure is insufficient and has led to a decline in the quality of public infrastructure, including roads and highways (Badu et al. 2012). Budgetary restrictions and other challenges associated with

traditional financing method have led many governments to explore other infrastructure financing options such as public-private partnerships (PPPs).

The PPP method has played a notable role in the infrastructure provision in both developed and developing countries. It has been used in sectors like road, energy, transport, telecommunication, and others (World Bank, 2018). As stated by Grimsey and Lewis (2004), public sector financing of infrastructure projects through the private sector dates as far back as the sixteenth century, during the railway construction boom in the United Kingdom. Indeed, the private finance initiative (PFI) method for infrastructure developed started in the United Kingdom and raised the world's awareness to this alternative financing option as a vehicle for delivering infrastructure (Ismail and Haris 2014b). Since then, it has been acknowledged globally as a means to attract private sector investment into infrastructure projects (International Bank for Reconstruction and Development [IBRD] 2017; Ameyaw and Chan 2016).

PPP has been described by the (United Nations [UN] (2002), as the intervention to supply the infrastructure gap in both the developed and the emerging markets. The World Bank (2014) & Chen and Man (2020) argued that bridging the infrastructure gap is a global challenge, in which the private sector has a critical role to play. The PPP initiative encourages private sector investment in infrastructure development (Okello 2009). Tite (2008) opined that the PPP method fosters the synergy of multi-disciplinary capital, reduces the incidence of time and cost overrun, reduces the public sector dependence on the public sector finance for infrastructure development, and provides better quality services. Many jurisdictions have used the PPP concept to bridge their infrastructure gap in many sectors, such as education, healthcare, custodial, transport infrastructure, public buildings, defence, and information technology facilities.

In almost all the jurisdictions where PPP has been used, the transport sector, particularly roads, has always been used as a pilot before consideration is given to the other areas of the economy (Engel et al. 2014). Road infrastructure is one of the significant assets of every country, as it provides economic and social benefits for individuals, groups of people, companies and industries; it enables goods and services to be delivered timely and effectively and also enhances free movement of people (Biau et al., 2008). Efficient roads have always played a leading role in economic development. Building efficient roads immediately boost economic output and create jobs; it also helps to spur future economic growth and manufactures alike to transport their goes to their customers (Zangoueinezhad

and Azar 2014). Chotia and Rao (2018) & Buertey and Asare (2014) postulated that an efficient road system is critical for the economic sustainability of a country, as it provides opportunities for people to access various economic and social resources. Because of the capital-intensive nature of road development, the scarcity of financial resources and the government's interest in keeping the debt of the public accounting records as low as possible, there is an increase in demand for using private finance for infrastructure development through the PPP arrangement (Li and Hensher 2010; Buertey and Asare 2014). Roads are the primary means of transport in most developing countries, including Ghana. Arguably, roads in Ghana carry about 95% of passenger and 98% of freight cargo traffic (Price water house Coopers [PwC] 2013). Therefore, investment in Ghana's road infrastructure development is crucial because of its critical role in the economic performance of the country. Given the scale and national importance of roads, many roads and highway agencies in the world have adopted asset management principles which aim at managing a road network to satisfy the requirements of business and private road users. For example, Ghana has functionally classified its road network for efficient and effective management, as shown in Table 1.1. The departments and agencies that manage Ghana road network are Ghana Highways Authority (GHA), Department of Urban Roads (DUR), and Department of Feeder Roads (DFR) (Twerefou et al. 2015). The agencies and departments have a distinct function relative to the Ghana road classification. For instance, the DUR oversees the development and management of arterials roads, collectors/distributors, and local/access roads. The DFR handles inter-district roads, connectors/ travel mobility feeder roads, and access feeder roads. The GHA, on the other hand, has three main functional classifications of roads, namely, national roads, inter-regional roads, and regional roads. The national roads connect to the national capitals, the various regional capitals and neighbouring countries. The roads which connect to the neighbouring countries are of strategic importance; in terms of trade and regional integration. The regional roads also link the district capitals to the nearest district capital, as well as to the major industrial hubs, business and tourist centres (Twerefou et al. 2015; Roads sector Medium-Term Development Plan [RSMTDP] 2014-2017; SMTDP 2014-2017).

Table 1-1: Functional classification of roads in Ghana

Classification	GHA	DUR	DFR
Primary	National	Major Arterials	Inter-District
Secondary	Inter-Regional	Collectors/Distributors	Travel Mobility Feeder Roads (Connectors)
Tertiary	Regional	Local/Access	Access

Source: Twerefou et al. (2015) and the Ministry of Roads and Highways (2019)

Currently, the national roads connect to three neighbouring countries: Burkina Faso (602 km from Accra) to the north, Ivory Coast (720 km from Accra) to the west, and Togo (1,098 km from Accra) to the east. Unfortunately, most of the roads connecting Ghana to these neighbouring countries, regional capitals, and most strategic economic hubs are in a deplorable condition (see annotated pictures in Appendix H). The gap between the current road network and the roads require to connect neighbouring countries, cities, regional capitals, and critical sectors of the economy are alarming (Shiferaw et al. 2012; Teye Buertey and Asare 2014). The road infrastructure gap is expressed as the difference between the present road infrastructure investment requirement, the future requirement, and the capacity of the current economy to provide for or cater to the future road infrastructure requirement (Teye Buertey and Asare 2014). Available data from the Ministry of Road and Highways (MRH), indicates that there are approximately 71,063 kilometres of road in Ghana, comprising 42,190 km of feeder roads 14,000 km of urban roads, and 14,873 km of trunk roads. However, the extensive use of road transport relative to other forms of transport, coupled with a lack of funds for routine maintenance, has led to the early deterioration of the roads in Ghana, creating congestion on some of the roads throughout the country. As indicated in Figure 1.1, currently, 39% of the road network is in good condition, 32% is in fair condition, and 29% is in poor condition compared to the nationally expected level of 70% good and 10% poor (National Transport Policy 2008).

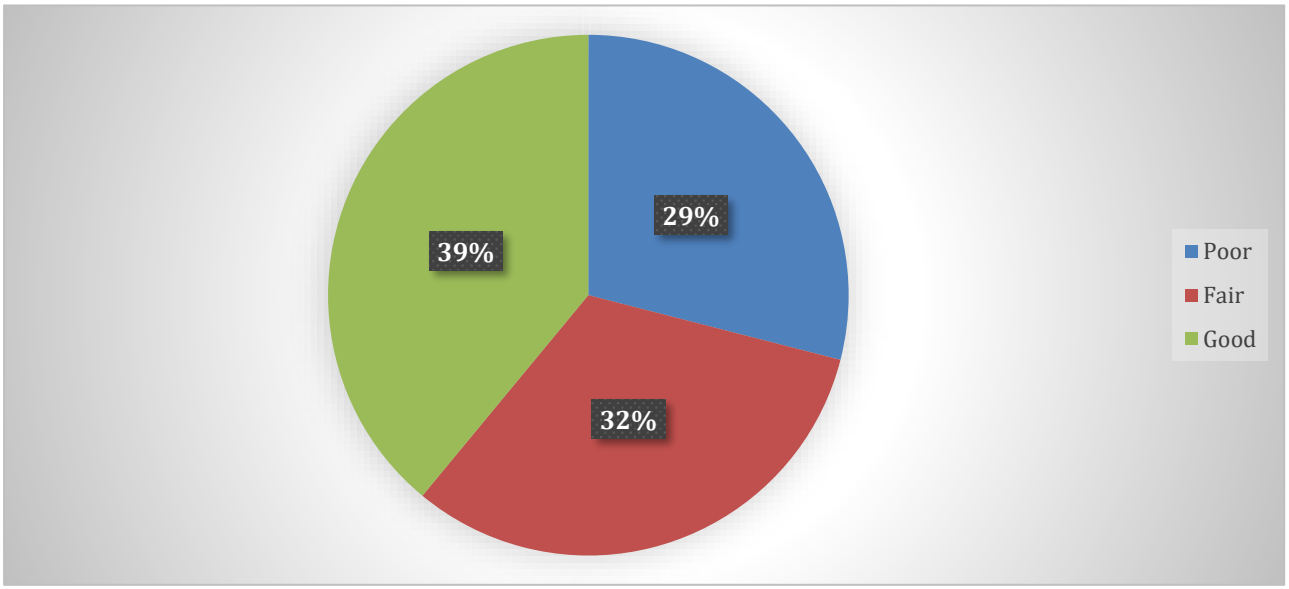


Figure 1- 1: Ghana's Road Condition Mix,

Source: Ministry of Road and Highways (2017)

The current poor state of Ghana's roads has resulted in high accident rates, untimely deaths, insecurity, increase in travel times, and an increase in the costs of operating and maintaining vehicles, all of which has led to annual losses to the economy (MRH 2016). Available report from the National Road Safety Commission (NRSC) indicates that in 2016, a total of 8,651 crashes involving 14,042 vehicles were recorded with 2,084 fatalities and 10,438 injuries (see Table 1.2). These conditions exist because the road infrastructure development has not received the needed financial resources from the government. To prevent this high level of mortality on Ghana roads, capital investment to improves the conditions of these roads is urgent. However, the government of Ghana faces the challenge of raising the necessary financial resources to upgrade these roads.

For example, in 2016, the government of Ghana signed a contract to upgrade one of Ghana's busiest national roads (from Accra–Kumasi). However, the project has since stalled due to lack of funds. The non-availability of funds to develop Ghana's major road arterials has created a considerable gap in the road development in Ghana, leaving the road network unable of supporting the socioeconomic activities it was intended to support (Bakari 2017; Siyan et al. 2015; Mbulawa 2017). Hence, this study focus is on national roads, inter-regional roads, regional roads, and other related roads that lead to economic hubs in Ghana. The rationale is that the investments required to develop these roads are significant, sunk up-front, and long-term. Additionally, they tend to be a natural monopoly (high start-up costs or economies of scale of conducting business in a specific industry). Therefore, private interventions in the form of investment are justified (Towels 2017; Mécanique et al. 2019).

Table 1-2: Road Traffic Crash and Casualty Situation in Ghana - 2016

Crashes	Vehicle Involved	Fatalities	Injuries
8,651	14,042	2,084	10,438

Source: NRSC (2016)

1.3 Problem Statement

The government of Ghana is the main financer of road infrastructure development in Ghana. The sources of funding for road development are the monies from the Ghana Road Fund, the Consolidated Fund and funds from bilateral and multilateral donor agencies' (Ignatius and Buertey 2014). However,

inflows from these sources are inadequate to provide road infrastructure needed for the Ghana economic transformation Ghana envision.

Bridging the infrastructure deficit in Africa will require an outlay of between US$130–US$170 billion annually (AfDB 2018). Ghana needs efficient infrastructure, including roads, railways, and energy infrastructure, to drive the industrialisation agenda of the country (Ghana Ministry of Finance, [(MoF] 2019), however, bridging the Ghana infrastructure deficit will require approximately US$ 30 billion annually (MoF 2018), with the amount required for the roads sector alone amounting to US$ 400 million. In 2019, the government, as part of the key policy initiatives and critical expenditures, spent approximately Ghana Cedi (GHS) 862,631,944 (equivalent US$ 179 million) on road infrastructure development (MoF 2018). The disparity between the road deficit and the actual expenditure is a significant concern, and the demand for a good road network has become a topical issue among the political class, academia, policymakers and citizens. The poor state of the roads has led to public unrest; in 2019 alone, there were at least 19 reported public protests over the terrible roads in some parts of the country, which has now become a national security issue (Ghana National Security 2018).

Comparing the government of Ghana revenue inflow with the substantial financial commitment, it is evident that it will be a challenge for the government to create the needed space in its budget and provide the necessary financial outlay for the maintenance of existing roads and also develop the roads that will support the economic growth of the country (Teye Buertey & Asare 2014; MoFEP 2017). Within the context of the prevailing current government's financial situation; revenue income and revenue reserves, the government inflows are not enough to address the infrastructure needs of the country. This, therefore, underscores the need for a strategic rethink of alternative financing strategies for road development in Ghana (AfDB 2013; Loxley 2013; MoF 2016, 2018; Zaharioaie 2012).

Over the years, Ghana has benefited from bilateral and multilateral donor agencies' support in the form of loans and grants for infrastructure development, particularly roads (Nana-Benyin 2011; Andreski 2008). Indeed, a significant number of roads in Ghana have been financed through loans and grants from such agencies. However, considering the recent global financial outlook (World Bank 2018), this support can no longer be guaranteed. Sihombing (2009) and Babatunde et al. (2017) believe that this traditional way of financing large-scale infrastructure projects by relying on

government revenue and donor grants and loans from the multilateral agencies is no longer sustainable.

Taking into account the huge capital requirement for road development (MoFEP 2011; Buertey and Asare 2014), the inefficiency and the unsatisfactory nature of the current procurement method (Ren et al. 2012; Kwofie et al. 2016) and the government's inability to inject the needed financial resources into road infrastructure projects (Teye Buertey and Asare 2014; MoFEP 2017; Foster 2008; Sihombing 2009), has arguably informed the Ghana government's consideration of realignment of the infrastructure financing policies in favour of PPPs (MoFEP 2011; Zhang and Chen, 2013). The government of Ghana has had to seek alternative ways of addressing this alarming infrastructure deficit. The PPP approach emerged as the best alternative option because of its success in delivering infrastructure projects in both developed and developing economies and relieving governments from depending on its internally generated revenues (Cheung and Kajewski 2012; World Bank 2015; MoF 2011). The PPP initiative may not be a panacea for the entire road deficit; however, it will offer ways to attract private sector investment in road infrastructure development in Ghana (MoFEP 2011; Buertey and Asare 2014) and relieve the government from its road infrastructure deficit.

For this reason, the government of Ghana launched the Ghana National Policy on PPP in June 2011. The policy established some provisional framework to regulate the implementation of PPPs in Ghana, in anticipation of the enactment of the Ghana Public-Private Partnerships Bill. However, despite the launching and adoption of the PPPs approach in 2011, available records from the World Bank (2018) on PPP infrastructure project in Ghana indicates that some of the sectors are doing well. For example, between 2012-2019, seven PPP projects reached financial closure, representing a total investment amount of US$ 5,735. Nevertheless, the private sector has not shown the same interest in the PPP road projects. The attainment of economic prominence, social development, political and socio-economic integration and achievement of the United Nation (UN) sustainable development goal (SDG) No 9, the African Union (AU) goal number 10 of Agenda 2063 and the High Five Goals of the African Development Bank (AfDB), is challenged by inadequate financial resources, thus, the need for the private sector financial resources.

Since the introduction and the global acceptance of PPPs, there have been many studies on PPP project implementation. However, some of the Ghanaian-specific studies have centred on Critical Success Factors (CSFs) for the successful PPP implementation. For example, Osei-Kyei and Chan

(2017a), Osei-Kyei, and Chan (2016), Osei-Kyei and Chan (2017), Ameyaw and Chan (2016), Kwofie and Botchway (2016), and Ameyaw et al. (2015) among others investigated the Critical Success factors for PPP. A few researchers have also identified the reasons and drivers for PPP adoption in Ghana (Osei-Kyei et al. 2014). Others, like Osei-Kyei and Chan (2017), Ameyaw and Chan (2015), Ameyaw and Chan (2013), Osei-Kyei and Chan (2018b), Owusu-Manu et al. (2018), Osei-Kyei et al. (2019), and Buertey and Asare (2014), have also studied the obstacles/implementation constraints and the public sector's perspective on PPP implementation. The only exception is the development of best practice framework for PPP projects implementation for construction projects in Ghana by Osei-Kyei and Chan (2018a). However, Osei-Kyei and Chan study was not road sector-specific and did not identify challenges preventing the private sector from investing in PPP road project and offer detailed solutions.

1.4 Research Gaps

The above suggests that despite the many studies about PPPs in Ghana, none has focused on roads sector-specific PPP arrangements to examine the challenges that prevent the private sector from investing in PPP road projects in Ghana. Indeed, empirical studies in both developed and developing countries on challenges preventing the private sector from investing in road PPP projects and best practice framework to address the challenges are limited. The need for the Ghanaian road sector-specific PPP studies is encapsulated in the differences in the existing legal structure, institutional arrangements, political and administrative environment, cultural differences, and socio-economic environment of Ghana (Grout 2005; Alfen et al. 2009). As suggested by Tang et al. (2010) and the World Bank (2016), PPP implementation should take into consideration the prevailing circumstances of the host country and sector. The approaches to attracting private sector investment in the roads sector are different among countries and sectors. These differences make it unreasonable to merely accept any particular theory or concept and apply it for a specific sector within different settings. Therefore, the research from the context of the Ghanaian road sector is a novelty. Hence, this study employed a pragmatist research approach in identifying the factors preventing the private sector from investing in PPP road projects in Ghana. It also provides the basis and drives for developing a road sector-specific best practice framework. Understanding the issue from multiple research approaches will offer practical knowledge of the problems relative to PPP road projects not only in Ghana but also to other developing countries with a similar socio-economic background.

1.5 Research Rationale

This study investigates the challenges preventing the private sector from investing in PPP road projects in Ghana. Also, it develops the best practice framework based on a well-organised method. The process includes a review of relevant literature, conducting semi-structured interviews with 10 PPP expert from Ghana and a questionnaire survey. The best practice framework seeks to propose solutions to address the identified challenges throughout the PPP project cycle. The best practice framework, if implemented, will create the necessary enabling environment for PPP road projects in Ghana and thereby attract investors to the PPP road projects. The construction industry is diverse and involves many stakeholders with varied interest. Therefore, the researcher is of the view that no one framework can cover all the Ghanaian construction industry or address the aims of all the stakeholders involved in the PPP project cycle. Thus, this study concentrates on developing a best practices framework that will address the challenges preventing the private sector from investing in PPP road projects. The rationale is to create the necessary enabling environment for the private sector to invest in PPP road projects in Ghana.

1.6 Research Questions

Based on the above premise, the research, therefore, seeks to address the following key questions:

1. What are the challenges associated with the public financing of road projects in Ghana?
2. What are the challenges preventing the private sector from investing in PPP road projects in Ghana?
3. What are the global best practices that can address the challenges identified in the study?
4. How can the challenges identified from the study be addressed to create the necessary enabling environment to attract private sector investment in PPP road projects in Ghana?

1.7 Aims and Objectives of the Study

This research study aims to develop a best practice framework to address the challenges preventing the private sector from investing in PPP road project in Ghana by looking at global best practice. In line with the research aims, the following objectives were established.

1. To critically examine the existing knowledge on public-private partnerships (PPPs) to gain an understanding of PPPs, infrastructure financing, PPP project vehicles and drivers, and the success or failure of PPP projects.
2. To investigate the challenges preventing the private sector from investing in PPP road projects in Ghana
3. To explore the global best practices that can address the challenges identified from the study; and
4. To develop and validate a best practice PPP framework that addresses the challenges identified from the study.

1.8 Research Methodology

Pragmatist research approach comprising semi-structured interviews and survey was employed for this research. Saunders et al. (2016), is of the view that using a number of research approaches can neutralise the issues inherent in using only one method or cancel the prejudices of the other method. In light of this, a semi-structured interview with PPP experts in Ghana was conducted, followed by a survey questionnaire. The process adopted for this research is presented in Figure 1.2.

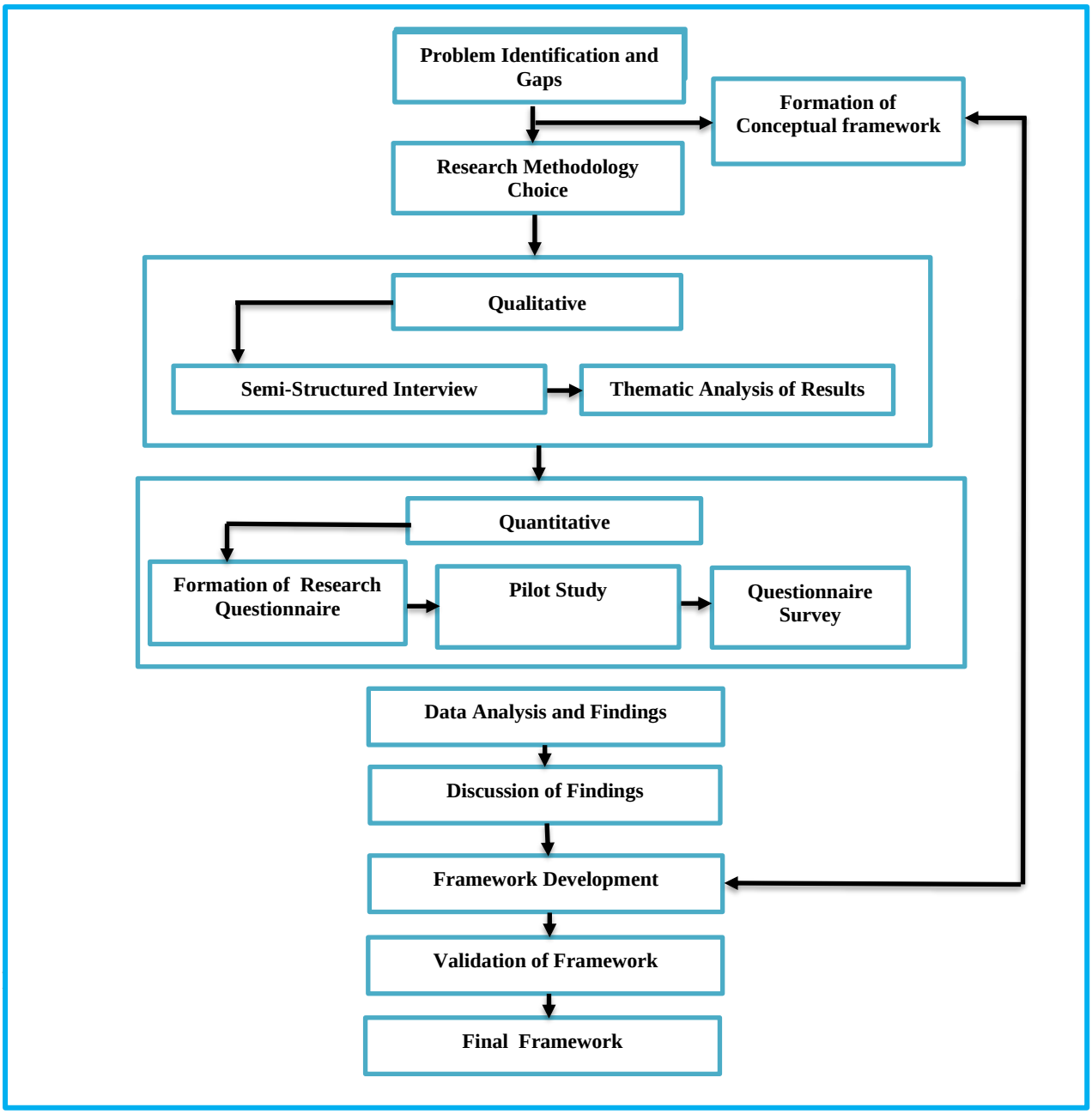


Figure 1-2: Research Process

1.9 Structure of the Thesis

This thesis comprises of seven chapters. The chapters are briefly introduced, as follows:

Chapter 1: Introduction

This chapter discusses the research background, the research rationale, the research aim and objectives, the scope of the research, the problem statement, and the research rationale for the study. Also, the research approach, a brief description of the research methodology, and the structure of the thesis are discussed in this chapter.

Chapter 2: Overview of Public-Private Partnerships and Private Finance of Public Infrastructure

This chapter reviews PPPs and the private financing of public infrastructure, followed by the various definitions of PPP and the types of PPP model for road projects. The drivers for PPP, success and failures of PPP, and project financing are explored in this chapter. The theory which underpins this study is also examined. Finally, a conceptual framework for the study was developed.

Chapter 3: Research Methodology

This chapter presents the research philosophy, research design, methodology choice, and the technique and procedure for data analysis, and it justifies the stance adopted for the study. It also discusses the various research methods, such as data collection, and the methods of analysis adopted for the study.

Chapter 4: Data Analysis and Findings (qualitative and quantitative)

The chapter presents the findings of the semi-structured interviews and presents the results and discussions regarding the quantitative information derived from the 168 survey respondents.

Chapter 5: Discussion of Research Findings

The chapter presents a summary of the key findings from the literature review, discusses the individual factors from the research analysis, and links the findings to the reviewed literature. It also discusses the best practices to address the factors identified in the research.

Chapter 6: Best Practice Framework Development

The chapter provides a step-by-step procedure on how the best practice framework was developed and the process and methods adopted to validate the framework.

Chapter 7: Conclusions and Recommendations

This chapter summarises the core research findings, discusses the achievement of the research's aim and objectives, and offers recommendations for future research.

1.10 Chapter Summary

This chapter has provided a general overview of and a brief introduction to the focus of this research including the problem, questions, aim and objectives, summary of the methodological research steps, and the significance of the research. Having provided an overview of the research, the in-depth review of the literature to set the foundation of the study is discussed in the subsequent chapter.

CHAPTER 2: PUBLIC-PRIVATE PARTNERSHIPS AND PRIVATE FINANCE OF INFRASTRUCTURE

2.1 Chapter Introduction

The research background, problem statement and the aim and objectives of this study were discussed in the previous chapter. This current chapter explores the existing knowledge on PPP to gain a deeper appreciation of the issue under investigation. The chapter begins by discussing the theory underpinning this research, followed by a general overview of PPP; the various definitions and terminologies of PPP are also discussed in this chapter. A narrower definition of PPP relative to this study is offered, and the different types of PPP models were explored. Besides, the models which are predominantly used for PPP road projects were also discussed.

In a competitive global economy, various countries have adopted the PPP concept with different intentions and reasons; therefore, the drivers that motivate governments to adopt the PPP concept for infrastructure development are discussed within this chapter. Subsequently, the evolution of PPP is explored. The application of PPP in toll roads and highways is a mixture of successes and failures. These kinds of mixed results are an attribute of the project outcome. In this regard, a search of the literature on the successes and failures of PPP in the transport sector, particularly roads and highways, was conducted. The chapter also explores the infrastructure financing and the financing option predominantly adopted for PPP projects. Existing studies on PPP implementation challenges and global best practices for successful PPP implementation were explored. Finally, a conceptual framework to guide the research was developed.

2.2 Theoretical Underpinning of Private Sector Involvement in PPP Projects

In discussing the private sector involvement in infrastructure development, many theories can be adopted for this study. For instance, contract theory, system theory, organisational theory, management theory, governance theory, construction project management theory and others. Nonetheless, for this study, agency theory and economic theory were deemed applicable, as PPP is about the public in partnership with the private entity for mutual economic benefit. The two theories are discussed in the subsequent sections.

2.2.1 Agency Theory

Ghana lacks an efficient and high-quality road infrastructure network to sustain the economic growth the country desires. This is due to the constraint on the government purse. Hence, the desire to involve the private sector in a principal and agent arrangement. According to McCormack et al. (2013), agency theory is considered as an agreement with an individual or an entity to carry out a service or activity on behalf of a principal. Such arrangements sometimes involve entrusting some decision-making powers to an entity or a person hired or engaged. In this setting, is the government engaging the services of the private sector to provide road infrastructure. Such a relationship between the private actors in a principal-agent relationship for mutual benefit (Lixin 2008). In this study, the government's (principal) intervention in providing roads often ends in a disappointing result, ranging from a lack of financial resources, poor quality roads, and uncompleted, cost and time overruns and abandoned road projects, which have been the primary cause of poor road network and road traffic accidents. The government's (principal) failure to provide these essential public goods for citizens calls for private investment (agent) involvement in road developing through a PPP partnership. Hence, the need for PPPs where the agent and the principal form a contract for economic benefit.

2.2.2 Economic Theory

Over the years, PPPs have been studied from the perspective of contract theory. From the economic theory perspective, however, the difference between the traditional procurement method (TPM) and the PPP approach is that in the case of PPP, construction of the infrastructure and operations are usually bundled together (Hart 2003). The concept of developing an economic partnership between the state and the private sector began in the sixteenth century (Mostepaniuk, 2016). As cited by Stiglitz (2000), the implementation of PPP practises leads to changes in the economic system of motives and causes fault changes in the behaviour of economic agents. Thus, if a private firm offers a service, the public must pay to use it, and consumption and any payment will reduce the willingness of people to use the product. Therefore, when the private sector produces public goods, it leads to the underutilisation of those goods. However, considering the poor performance of the government of Ghana in the provision of road infrastructure and its underlying challenges in the country (World Bank 2016), it is essential to pay attention to both agency theory, where the principal (government) engages the agent (private sector) to finance road projects on the behalf the government (Phong et al. 2017; Jones 2015).

2.3 Overview of Public-Private Partnerships for Public Infrastructure

The situation where governments struggle to provide public infrastructure for the benefit of society has changed in modern times. Budgetary and financial challenges coupled with pressure on governments to expand and improve public infrastructure have compelled governments to look for an alternative source of funds for public infrastructure development (Osei-Kyei et al. 2014; Wang et al. 2018). Because of this, governments of developed and developing countries are now turning to the private sector for assistance in the provision of public infrastructure in the form of partnerships (Wang et al. 2018; Toriola-Coker 2018). PPPs, since their adoption, have been accepted worldwide as a progressive approach to procure public works, services, and goods. They have performed better regarding time, budget, and value for money (VfM) than the traditional method of procuring the same (Zhang et al. 2015; Cian 2019; Mohamad et al. 2018).

Before the adoption of PPPs in many countries, procurement of public infrastructure was through the traditional procurement method (TPM) (Yescombe 2010). Under the TPM, the government procures works, goods and services and pays for work done from internally generated revenue. With this procurement approach, the government is responsible for the maintenance of the works after the defect liability period. The contractor is sometimes reliable for some hidden defect over a long period (APMG PPP Certification Guide 2016). In the case of the PPP, however, there is usually a long-term contract between a private party and the government, through its agent, for the private party to provide infrastructure, goods, and services, which hitherto were within the domain of the public sector (Ismail 2014; Osei-Kyei and Chan 2017c). The private party, in this case, becomes more involved in the provision of public projects.

2.4 PPPs Definitions and Terminologies

In recent times, the PPPs approach has been used globally to attract private capital and expertise for public infrastructure development. Globally, the PPP concept has been acknowledged as an alternative procurement method for infrastructure development (Kavishe et al. 2018), because it is perceived to perform better on time, cost and value for money compared to the traditional method (Babatunde et al. 2016a; Cheung et al. 2012). However, so far, there is no generally recognised definition for PPPs (European Investment Bank [EIB] 2010; World Bank 2014; Jayasuriya 2017).

PPPs definition largely depends on the country, the organisation, and the objectives of the parties involved (Klijn and Teisman 2003; Kavishe et al. 2018). As postulated by Li and Akintoye (2003), there is no consensus on the definition of PPP. This assertion was corroborated by recent researchers like Osei-Kyei and Chan (2018a), Kavishe et al. (2018), and Cui et al. (2018). Early researchers, institutions and countries have defined PPP differently. Some of the definitions are presented in Table 2.1.

Table 2- 1: PPP definitions

Authorities/authors	**Definitions of PPP**
The United Nations Development Programme (2008).	*"A contractual arrangement between a public-sector agency and a for-profit private sector developer; in this arrangement, both resources and risks are shared in order to deliver a public service or the development of public infrastructure".*
Canadian Council for PPP, Canada (2004)	*"A cooperative venture between the public and private sectors, built on the expertise of each partner, which best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards".*
World Bank (2014)	*"A long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance."*
European Investment Bank(2010)	*"A generic term for the relationships formed between the private sector and public bodies, often with the aim of introducing private sector resources and/or expertise in order to help provide and deliver public sector assets and services."*
Hodge and Greve (2007).	*Loosely defined PPP as "cooperative institutional arrangements between public and private sector actors."*
Van Marrowlike et al. (2008)	*"defined PPP from another perspective which is structural cooperation between public and private parties to deliver some agreed outcome."*
Akintoye et al. (2003)	*"defined PPP as a cooperative venture between the public and private sectors for the delivery of public service through appropriate allocation of resources, risks and rewards."*
Chinyio and Gameson (2009)	*"long-term alliances formed between the private sector and public bodies often with the aim of exploring the private sector's" resources and expertise in the provision and delivery of public services. "*

Also, many terms have been in use, depending on the jurisdiction. Some terminologies and alternative names of PPP as it relates to different countries are highlighted (Yescombe 2007). For instance, private participation in infrastructure (PPI), was created by the World Bank and commonly used in South Korea; private-sector participation (PSP), used in the development of the banking sector; P3, used in North America; privately financed projects (PFP), used in Australia and private finance initiative (PFI), a term originating in the United Kingdom (UK) and also being used in Japan and Malaysia. The above definitions and terminologies depict the diverse interpretations of PPPs. Nevertheless, all the descriptions and terminologies have some common characteristics, which this study will explore.

However, this study focus is on PPPs as an alternative procurement method for financing public infrastructure projects, where the private sector wholly or substantially finances the public infrastructure. Financing of public infrastructure is a significant challenge for Ghana; therefore, this study deems the definition provided by the World Bank, which is mainly about a long-term contract between a private party and a government entity, for providing a public asset or service, where the private party provide substantial financing and bears significant risk and management responsibility, and remuneration is linked to performance, more applicable. Having defined PPPs in the context of this study, the subsequent section explores the types of PPPs predominantly used for infrastructure projects.

2.5 Types of PPPs

There are different types of PPP methods, which demonstrates the differentiating route or model of procurement for contracting infrastructure development and management. Some of the types mentioned by the United Nations Economic Commission for Europe [UNECE] (2008), Yescombe (2010), the World Bank (2009), and APMG (2016) use for infrastructure projects are as follows:

DBFOM (Design-Build-Finance-Operate-Maintain): “The responsibilities for designing, building, financing, operating and maintaining of the project are linked together and transferred to private sector partners.”

DBFOMT (Design-Build-Finance-Operate-Maintain-Transfer): **"**This is the same as a DBFOM except that the private sector owns the asset until the end of the contract at which point the ownership is transferred to the public sector".

BOO (Build Own and Operate): This type of arrangement leaves the control and ownership of the facility in the private partner. "The private sector entity finances, builds, owns and operates the facility in perpetuity."

JV (Joint Ventures): "Where the public and private sectors jointly finance, own and operate a facility."

CM (Management Contract): "With this arrangement, the private sector company provides a service or range of services or manages the operation of a facility on behalf of the government for agreed fees."

BBO (Buy-Build-Operate): "This is a form of an asset sale that includes rehabilitation or expansion of an existing facility. The government sells the asset to the private sector entity, which then makes the improvements necessary to operate the facility effectively".

PPPs come in a variety of forms, and not all the types discussed above are considered as purely private finance PPPs. For this study, the focus is on a PPP arrangement that allows a long-term contract between the private sector and the public sector for the provision of public infrastructure. Such an agreement is often termed as DBFOMT. This approach is a well-established method of project financing; the arrangement gives the private sector the option to finance infrastructure projects without the public sector upfront investment into the infrastructure (Engel et al. 2011). It also reduces public sector expenditure on infrastructure development and allows the public sector to concentrate on other sectors of the economy (Annamalai and Jain 2013). Also, it provides technology innovation and transfer and value for money (Mohamad et al. 2018) and improves the performance and efficient management of public assets (Ortega et al. 2016; Ching 2003).

2.6 PPP Models for Roads and Highways

The three main PPP contract models which have been used globally for roads and highways projects are the concession PPP model, the availability payment PPP model, and the shadow toll PPP or

output-based payments model (World Bank 2014; Cheung 2009; Ortega et al. 2016). These models are now discussed in turn in the next section.

2.6.1 Concession PPP Model

The concession PPP model can also be referred to as user financed (Alfen 2009). Under this model, the private party is allowed the right to design, finance, construct and operate a road project for a fixed period, depending on the terms of the concession. Notwithstanding, it is expected that during the concession period, the private entity will recover its investments and profit from the revenue stream, usually for toll project, monies paid by the users are in the form of tolls (Farquharson et al. 2011; Adekunle et al. 2009). However, in some jurisdictions, it is the government that regulates the tariff; therefore, the private party does not have the luxury of fixing and reviewing the toll (Abiod, 2012). In such a situation, most concession agreements are a structure in a way that when the revenue from toll fees falls short, to the point where the private party cannot recover its principal capital, operating cost and maintenance costs, the host government provides subsidies so that the charges will not be too high for it to be affordable by the public (Nguyen, Garvin and Gonzalez 2018; Cui et al. 2018).

2.6.2 Availability Payment Model

Unlike the concession PPP model, where the private party is granted the right to recover its investments and profit from the stream of revenue paid by the users in the form of tolls, under the availability payment model, the government pays the private partners by regular payments based on the level of service provided (World Bank 2009). Depending on the nature of the payment plan, these payments are at times fixed or adjustable, for instance, availability payments for the highway infrastructure, or based on the level of use (e.g., shadow tolls). According to the World Bank (2009), this approach is comparatively new, and it represents the idea of the private sector, providing a distinct level of service to the public sector.

2.6.3 The Shadow Toll Model

The shadow toll model is like the availability payment model. However, the main difference between the two models is that under the shadow toll model, payment to the private party is based on the traffic shadow toll rather than a fixed fee, which makes the traffic risk higher than in the availability model

(Bustillo Alonso and Laedre 2015; Musawa, Ismail and Ahmad 2017). For this reason, the terms 'availability model' and 'shadow toll model' will be used interchangeably for this study.

2.7 Drivers for Adopting PPPs

What drives governments to adopt the PPP approach differs depending on country and institutions. Nonetheless, some PPP researchers think that most developing countries are adopting the PPP approach as a condition on loan from international organisations (Osei- Kyei et al. 2014). It has also been argued that the reasons for adopting PPP depend on the objectives of the parties involved in the PPP agreement. However, APMG (2016), mentioned three main reasons a government adopts the PPP method as follows: 1) PPPs as a financial mechanism for governments, including the "off-balance-sheet" motivation; 2) for project efficiency and effectiveness, and 3) for transparency and controlling corruption. Other factors Jayasuriya (2017) suggested social, legal, economic, political, and technological expediency as some of the reasons the government adopts the PPP method.

2.8 History and Evolution of PPPs

PPP has a long history. As stated by Grimsey and Lewis (2004), public sector financing of infrastructure projects through the private sector dates as far back as the 16th century during the time where the railway construction was thriving in the UK. Indeed, the private finance initiative (PFI) practice developed in the UK, raised the world's awareness of this alternative procurement option as a vehicle for delivering infrastructure (Ismail and Haris 2014b). Since then, it has been acknowledged globally as a means to attract private sector investment into infrastructure projects (International Bank for Reconstruction and Development [IBRD] 2017)]; Ameyaw and Chan 2016). A brief discussion of the performance of PPP in some developed and developing countries, including Sub-Saharan African, is as follows:

2.8.1 PPPs in Developing Countries

Some developing countries, such as Brazil, Chile, China, and South Africa, have accepted the PPP method and are using it to accelerate their infrastructure development (OECD 2008). However, the pace cannot be compared to some developed countries. Wibowo and Alfen (2014) pointed out that private investment in infrastructure declined in 1997 after the Asian crisis. The downward trend

continued until 2004 and 2005 when private sector investment increased to reach a peak of $95 billion, moving from 0.7% of the share of the developing countries GDP in 2003 to 1% in 2005. Telecommunications took the lead with 63% valued at $60 billion. Figure 2.1 presents the top 10 countries by investment across the developing regions, showing that Brazil takes the lead with an investment of US$ 404.2 million, India comes second with an investment of US$ 265.8 million, with Malaysia being the last country with an investment of US$ 52,.3 million (World Bank 2018).

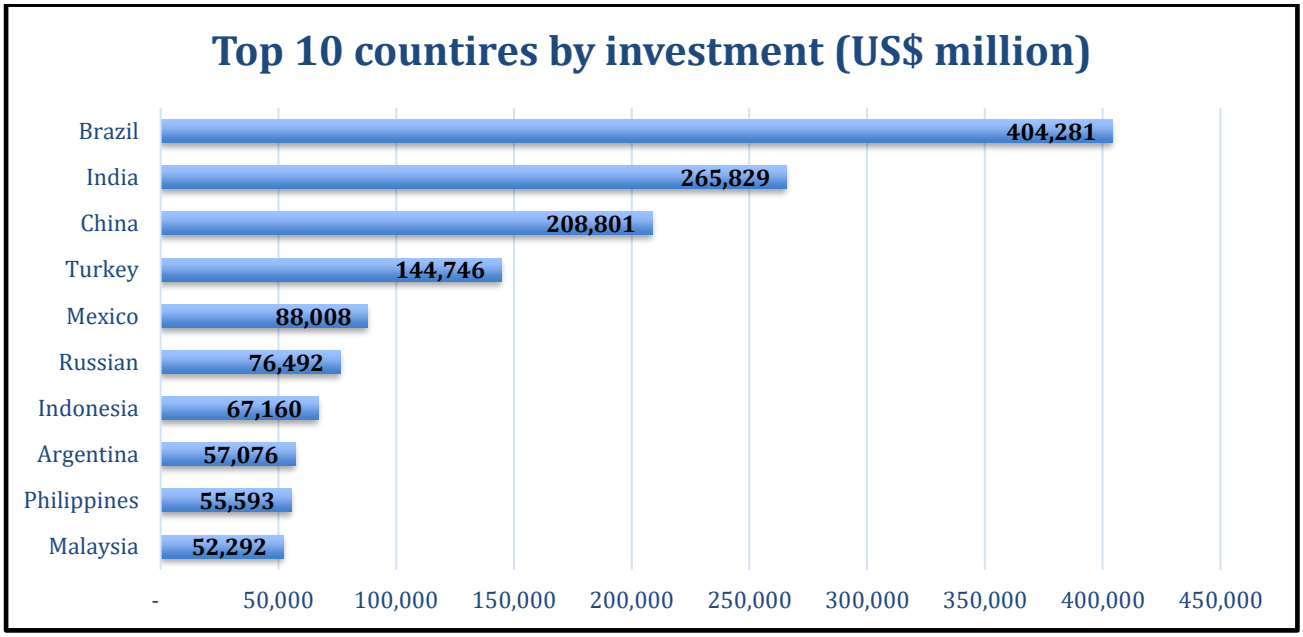


Figure 2-1: Number and projects by region

Source: World Bank PPI Project Database (World Bank 2018)

2.8.2 PPPs in Sub-Saharan Africa

The PPP performance in Sub-Saharan Africa (SSA) is abysmal. Indeed, it is one of the worst-performing regions in respect of PPP by nearly all dimensions, including the quantity of infrastructure and quality of and access to these services. The SSA is ranked second lowest for global private finance of infrastructure with US$69.4 million investment in infrastructure projects in the period 1990-2018, which is far below Latin America and the Caribbean (US$670.7 million) and East Asia with (US$470.2.4 million), South Asia, (305.8 million), Europe and Central Asia (US$280.8 million), SSA (US$79,272 million) and finally, the Middle East and North Africa (US$59,958 million). Out of SSA's contribution to the global private finance, South Africa had a 33% share of the investment at

US$26.5 million with Ghana taking 12.6% in the 29-year period. For SSA to bridge the infrastructure gap, there will be a need to increase private involvement in the provision of public infrastructure services through PPPs. Figures 2.2 and 2.3 represent regional ranking by the number of projects and by investment in infrastructure projects in the period 1990 to 2018, respectively.

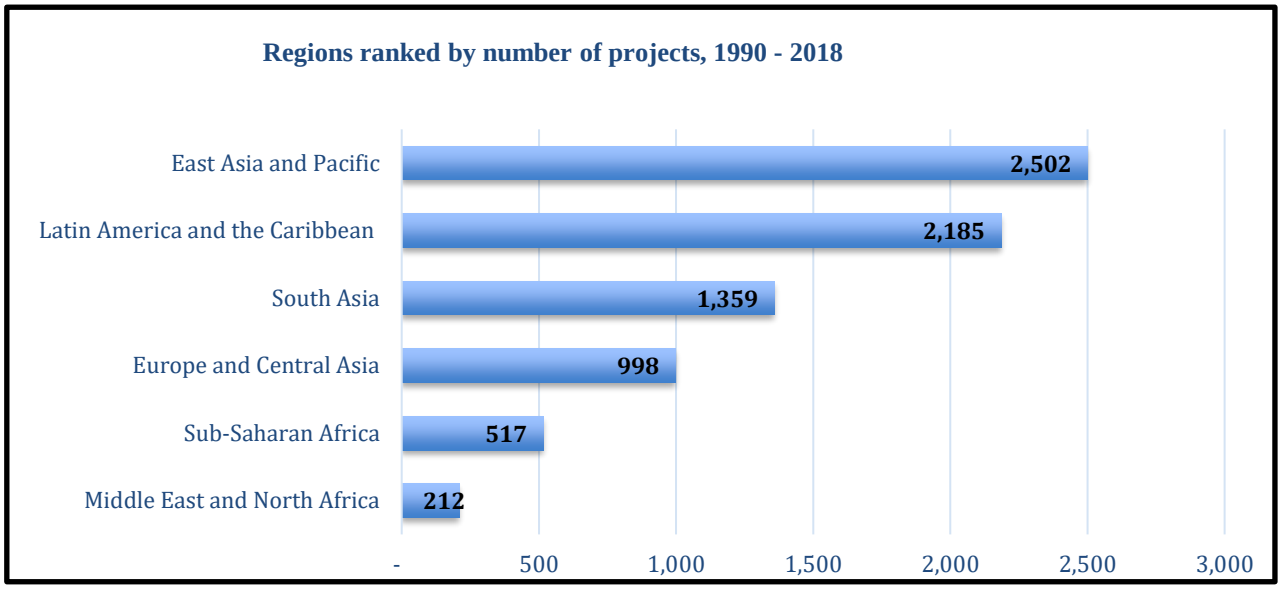


Figure 2-2: Number and projects, by region, from 1990-2018

Source: World Bank PPI Project Database (World Bank 2018)

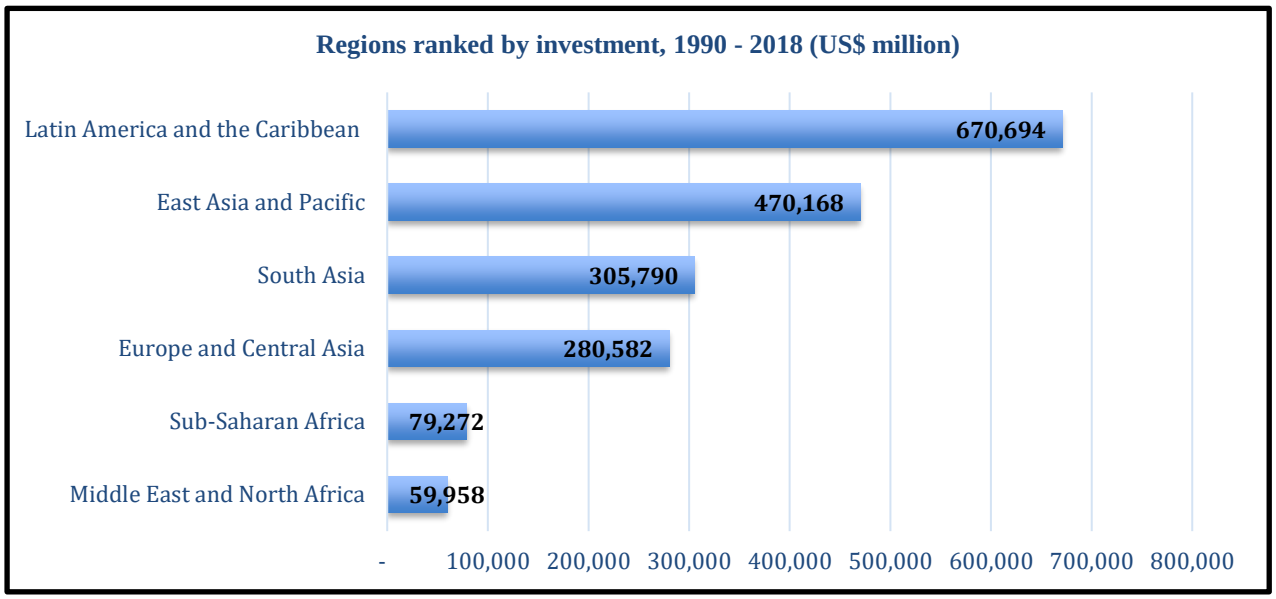


Figure 2-3: Number and projects, by investment, from 1990-2018

Source: World Bank PPI Project Database (World Bank 2018)

2.8.3 Evolution of PPP the Context of Ghana

The government of Ghana embarked on procurement reform with the view of improving accountability and how public finance is managed. The reform objective was to sanitised public procurement to correspond to local and international laws regarding public procurement. Besides, the reform was to encourage fair competition, ensure judicious use of the public funds, increase accountability and value for money for the taxpayer (MoF 2009).

Before the procurement reform, a study by the World Bank in 1996 acknowledged some significant deficiencies in Ghana's public procurement system, including lack of rigorous legal framework, lack of systematic procedures and regulations for procurement, lack of capacity of the public procurement officials, lack of clear institutional and organisational arrangement in respect of decision-making when awarding contracts (World Bank (1996). This identified deficiencies and many more led to Parliament enacting the Public Procurement (PPA) Act 663 in 2003 as amended. The Act brought together all the prevailing procurement laws (e.g., the District Tender Board Regulation 1995, the Ghana National Procurement Agency Decree 1976, and the Ghana Supply Commission Law 1990).

Part II of the Act deals with the establishment of the procurement structures via the Tender Committees and Review Boards. The reform has helped to streamline the procurement activities in Ghana in the areas of a legal framework and codified procedures; transparency in the procurement of works, goods, and services has also been improved. It has, therefore, brought confidence and reliance to the multilateral organisations and the private sector, but more remains to be done to encourage the private sector to commit financial resources to road infrastructure delivery.

However, the government of Ghana's desire to standardise private sector investment in public infrastructure prepared a National Policy on PPPs in 2004. The policy was to serve as the guiding principles for the public and private sectors working together in addressing the infrastructure deficit in Ghana. The National Policy on PPP was adopted in 2011 to provide the initial guidelines for PPP implementation in Ghana, awaiting the enactment of the Ghana PPP Bill, which is now being considered by the government. The Memorandum to the Ghana PPP Bill outlines the purpose of the Bill, which include; to provide institutional support to aid in stimulating private sector involvement in the provision of public infrastructure and services through PPP arrangements. Additionally, the Bill sought to establish the standards under which PPP could be effectively practised in Ghana.

2.9 PPP Prospects for Road Development in Ghana

The acceptance and the application of PPPs seem to be gaining ground in infrastructure delivery globally. The UN (2002) described the PPP intervention to reduce infrastructure demand and supply the gap in the emerging markets as critical. Levy (1996) argued that the need to construct, maintain, rehabilitate, and modernise infrastructure is a global challenge in which the private sector has a role to play. The PPP initiative encourages private finance through private sector investment (Okello 2009). Tite (2008) argued that the PPP method promotes the synergy of multi-disciplinary human capital, reduces the incidence of time and cost overrun (which are the major causes of abandoned projects in Ghana), reduces the financial burden on the public sector, and provides better quality services.

However, it is argued that the private sector-led economy alone will not address the problem of income inequalities and inequities in citizens' access to social services, and this calls for the government to develop strategies on alternative ways to provide physical and social infrastructure including strengthening the existing system (Ibrahim 2008; Feese 2008). The success that PPP is gaining in the road sector in some African countries, such as Nigeria, Mozambique, South African and Senegal, suggest that Ghana's roads infrastructure development may benefit from its implementation (Tite 2008; Olowosulu, 2005). Indeed, there have been reports of a more favourable project performance where the PPP procurement method has been used compared to the TPM (Cartilidge 2006; Grimsey and Lewis 2004). Interestingly, in all countries where PPP has been successful and well developed, the first PPP trials or attempts have always been a challenge, and in the transport category, roads are usually used as a pilot study (OECD 2008; HM Treasury 2010; Yescombe 2007). Since the introduction of PPP as a financial vehicle for infrastructure development in Ghana, the roads and highways sector, however, has not received the required attention from the private sector, and this has affected the development of roads and highways in the country. Nonetheless, there is the prospect of using the PPP approach to address the challenges associated with the funding of road projects in Ghana when the necessary enabling environment is created for private sector participation.

2.10 PPPs and Infrastructure Development

There is a connection between infrastructure development and the economic well-being of a country (Foster 2008; Cleveland 2008; Kumar et al. 2006; Siyan et al. 2015). While good infrastructure investment may well encourage the private sector to invest in the economy of a country to drive economic growth, the lack of it may dissuade other forms of private investment. The current literature, theories, and empirical evidence provide a strong case for the recognition infrastructure as an essential driver of economic growth (Mua, 2016; Barrie, 2011; Cui *et al.*, 2018). The importance of infrastructure and its influence on sustainable development and socio-economic development, achieving economic prominence and reducing poverty has been topic for discussion among researchers and commentators (Estache and Wooden 2014; Estache et al. 2005; Foster 2008; Carranza et al. 2014). The use of PPPs for infrastructure development is not a panacea, but some developed countries have used it in bridging their infrastructure deficit. Therefore, the subsequent section discusses the types of infrastructure suitable for PPPs.

2.10.1 Types of Infrastructure

Infrastructure is classified as social and economic infrastructure. According to Argy et al. (1999) and Grimsey and Lewis (2004), the types of infrastructure that come under the category of economic infrastructure are termed 'hard infrastructure' and include roads, highways, bridges, ports, railways, airports, public transport, telecommunications, and electricity and gas generation, transmission, and distribution, whereas 'soft economic infrastructure' includes financial facilities for business (payment, credit, equity, derivatives, ventures capital, etc.) (Mutambatsere, 2017). Meanwhile, social infrastructure, according to Grimsey and Lewis (2004), can help in providing basic services to households, thus, improving the quality of life and well-being in the community, particularly among individuals with a limited income. Many jurisdictions have used the PPP concept for several sectors, such as education, healthcare, custodial, transport infrastructure, public buildings, defence, and IT facilities. However, this research relates to the transport sector. Therefore, the emphases will be limited to the transport sector, particularly roads.

2.10.2.1 PPP for Transport Sector

As highlighted by Yescombe (2010), in the early stages of roads development in the US, there was a significant dependence on financing from the public sector. The parity between the growth in revenue

from taxes compared with highway demand has resulted in various approaches of private-sector involvement in highway development being explored. Engel et al. (2014) pointed out the three fundamental characteristics peculiar to transport development, either through PPPs or the traditional route.

First is the high level of externalities generated by a transport project, the positive social-economic implications, and the adverse environmental impacts. Second is the high upfront capital required for its development, which is difficult to spread over time, as the bulk of the capital investment occurs before the operation begins. The third is the traffic forecasting, especially as it relates to highways, and the accompanying projection of revenue streams, which is difficult to predict and requires sizeable margins of error. These characteristics result in a high level of risk that will expect a correspondingly high level of involvement by the government who is partnering with the private entity for development of roads and highways.

2.10.2.2 PPPs for Roads and Highways Infrastructure

Roads are classified within the economic infrastructure category. Chotia and Rao (2018) and Buertey and Asare (2014), argued that a good road system is critical for the economic sustainability of a country, as it provides opportunities for people to access various economic and social resources. Because of the capital-intensive nature of road development and the scarcity of financial resources and the government's interest in keeping the debt of the public accounting records as low as possible, the demand for using private finance and operating road tolls through the PPP arrangement has increased (Li and Hensher 2010; Buertey and Asare 2014). However, considering the diversity of PPP, it is, therefore, essential to define where PPP can be used effectively in road development as some road development and maintenance activity may not be considered suitable for PPPs in short to medium-term. In this respect, the application of PPPs for this study is limited to roads that require a substantial investment and a long-term contractual relationship.

2.11 Success and Failure of PPP Toll Highways and Roads

The application of PPPs in toll roads has had some failures and some successes. These kinds of mixed results are characteristic of a project outcome, in respect of the method of delivery, whether through the PPP approach or the traditional approach, depending on how the CSFs of projects are defined.

Abiod (2012) cited Ragazzi and Rothengatter (2005) on general lessons learned from PPPs on PPP highways concessions project across Europe. The lesson Ragazzi and Rothengatter highlighted was that experts tend to criticize the methods being used in their respective countries. While experts from countries where PPPs are being introduced criticize the scheme (stressing the shortcomings and caveats), experts in the countries where conventional public financing is still being used criticize the old method of inefficiency citing the diversion of road funding for other uses (Abiod 2012). The subsequent section discussed PPP success and failures in developed and developing countries.

2.11.1 Success and Failure in Developed Countries

Throughout the world, the development of toll roads is gaining prominence as a means of attracting private sector funding for roads and highways projects (Li and Hensher, 2010). Toll roads are familiar in most developed countries, but not all are in private hands (Abiod 2012). Countries whose highways and motorways are being managed by concession companies include France, Italy, Portugal, Spain, and Australia. In contrast, countries like Switzerland, Austria, the Czech Republic and the Slovak Republic, Germany, the Netherlands, Belgium, Luxembourg, Denmark, and Sweden have introduced some form of electronic toll system for heavy goods vehicles (HGV) in their motorways (World Bank 2009).

In countries where traffic volumes are high, and the road networks are well-developed, motorway concessionaires are highly profitable (APMG 2016; Abiod 2012), for instance, Italy, France, Spain, and Portugal. In Germany, for example, revenue from the toll roads, collected by the state-owned company (VIFG) is allocated to roads, railways, and inland waterways development. However, some developed countries which have adopted PPPs for toll roads, like Poland or Ireland, until recently were finding it difficult to raise private capital (Wentworth and Makokera, 2015).

An analysis carried out by Fayard (2005) on highway concessions in Europe observed that some of the reasons for adopting PPP are budget constraints, creation of autonomous agencies, development of PPPs for additional financing and performance enhancement, new technology, and traffic information management. The increasingly dense and congested highways, for example, in France, with the interrelationship of multiple concessionaires, called for the government to increase oversight and to regulate the investment separately taking account of toll policy. Generally, toll rate determination differs across Europe. For example, while Italy has a price cap method and uses the

traffic band method, in the UK, availability payment is common. The global challenge is the public acceptability of toll roads, which is on the increase due to five major factors: the number of tolls concerning the type of user, how toll is collected, improvement of user services, and provision of free alternative routes. Lessons learned on some highway concessions projects within the developed countries are summarised in the subsequent section.

2.11.1.1 Sydney Cross City Tunnel (CCT) – Australia

Pretorius et al. (2008) summarised the undesirable experience of the financial outcome of the CCT project. At the conceptual phase of the project, all project indications pointed to a viable/successful project. The project promoters were Cheung Kung Infrastructure (CKI) and Bilfinger Berger GmbH with the support of international banks led by Deutsche Bank. Project analysis showed efficient risk distribution and sound financers with the sterile political and institutional environment provided by the state of New South Wales. Bidding activities commenced with an expression of interest taking place in September 2000. Major works started in 2003, and the facility opened for traffic on August 28, 2005. The project recorded a low traffic volume initially. As of February 2006, 30,000 vehicles used the tunnel each day compared to the 90,000 projected, partly due to what some users considered the high toll, which made them use an alternative route. Other users complained of misleading signage that forced them to use the toll route. The government's stance that the project was completed without cost to the government is another area of criticism, as some believe that the traffic projection used an implied Internal Rate of Return (IRR) already promised to the equity investors. To attract better patronage from users, a toll-free period was introduced between October 24 - late November 2005. A freeze on any toll increase was introduced for one year, and a fee waiver was given to regular users of the tunnel. In the first six months, CCT was operating at about one-third of the projected income in addition to public relation problems, users' resistance, and negative media.

2.11.1.2 Douro Literal, Porto, Portugal

Grillo and Zegras (2011) reported that the Douro Litoral concession is a good example of recent innovation in metropolitan highway finance. The concession is a combination of BOT and management and operation (M&O) contract types within the same agreement, with revenues from radial BOT segments cross-subsidizing un-tolled circumferential and close-in radial segments of the larger network. Although the case represents a practical innovation to finance metropolitan highway improvements in Metropolitan Porto, it falls short of achieving the financial objectives of sustainable

metropolitan mobility (SMM). While the project offers a framework for balancing pricing, investment, and technology benefits of private finance with integration and public acceptability, the concession did not wholly meet each objective of SMM. Although the project used electronic road pricing with sound economic and financial analyses, it reveals some of the limitations of network-oriented PPPs that are still financed by traditional BOT methods. The concessionaire representative's view was that the situation would not encourage them to bid for a similar project in the future. The Portuguese government has also changed strategies for metropolitan network contracts in favour of availability payments as against tolls.

2.11.2 Successes and Failures from Sub-Saharan Africa

Lessons learnt from two PPP road projects in Africa; the Maputo N4 toll road connecting South Africa and Mozambique, and the Lekki Metropolitan toll road in the Lagos State of Nigeria are fundamental to this study because of the social and economic similarities. The experiences and lessons learnt from these two projects are discussed in the following sections.

2.11.2.1 South Africa and Mozambique Toll Road Project

From an African perspective, the N4 toll road from South Africa to Mozambique represents an example of a successful PPP toll road implementation (World Bank 2009). The project originated out of a political will for economic cooperation between neighbouring countries, namely, South Africa and Mozambique. It is a 30-year PPP toll concession, ownership of which will be transferred to the governments of South Africa and Mozambique at the expiration of the concession period. The two governments provided a debt guarantee. Haule (2009), is of the view that the N4 PPP is a good example of highway PPPs in Africa. Maputo Development Corridor (MDC) critics say that it does not support local business and that policy decision is central, leaving out local municipalities notwithstanding the impact of the infrastructure on the local level. However, according to the World Bank (2009), there are many goods lessons that countries new to PPP road projects can learn from South Africa and Mozambique projects.

2.11.2.2 Lekki Toll Road Concession

The success of privatization in the telecommunications sector encouraged the Lagos state to employ PPP to develop the Lekki expressway. The Lagos state government formed the Lekki Concession

Company Ltd (LCC) in 2006 to upgrade, expand, and maintain a 50 km stretch of the Lekki - Epe Expressway (Phase 1) and construct 20 km of the Coast Road on the Lekki Peninsular (Phase II) with BOT of 30 years. Costs and profits are to be recouped from toll charges. Lagos state's Roads Act 2004 provides the enabling framework for the PPP operation. Phase I of the road opened, and tolling commenced on 15 December 2011. The road facilitates access to social services like hospitals. Other benefits identified by Maduegbuna (2012) as being derived from the Lekki toll road are improved convenience, reduced travel times, enhanced safety, and better driving experience. However, the toll generated adverse reactions from the public. Other issues being raised are the initial lack of an alternative route, increased transport fares and cost of goods, and delays due to congestion on toll collection points during rush hours (Loxley, 2013). The Nigerian experience suggests that road PPPs can also be politically sensitive, though less so if alternate routes are available (Loxley, 2013).

2.11.2.3 Lessons Learnt for other Countries

To learn from the pitfalls and successes of those countries who have already implemented tolling of their roads and highways through the PPP approach. Some lessons for consideration are the concern for policy continuity across successive governments, premature policy change and policy inconsistencies; costs passed on to users, lack of community consultation, and frequent and sometimes unplanned changes in political leadership. There was no primary adverse reaction to the MDC toll when it was introduced in South Africa, unlike the case of Lagos, though both cases had generated earlier adverse reactions from the public. Changes in political leadership did not have any adverse effect on the two projects analysed. However, the lack of any alternative route for road users was a massive problem for the Lekki Toll Road Concession project. Delays due to congestion on toll collection points during rush hour were also a problem.

2.12 Criteria for Choosing between PPPs and Traditional Methods

The four fundamental elements need to be taken into account before a government decides whether a project will be delivered under PPP or not are 1) the core services consideration, 2) the value for money (VfM) consideration, and 3) the public interest consideration; 4) project viability consideration (Grimsey and Lewis 2004; Weber and Alfen, 2010). These are discussed in the next section.

2.12.1 Core Services Test

As mentioned earlier (see section 2.10), the PPP approach is used for widespread public infrastructure development. However, in some jurisdictions, the PPPs method is not allowed to be used for some particular services within some sectors (Sharp 2005; World Bank, 2014). There are other sectors that are also reserved for the government (World Bank, 2014). These services are sometimes called 'core services.' Core services are those which involve the direct delivery of community services to the public or the exercise of statutory power (Sharp, 2005). The aim of the core service test is to determine whether the services should be provided only by a government, in which case, their provision should be delegated only to the public sector to provide. In other words, this is to determine if the services to be provided through PPP are "pure public goods" or just "normal public goods."

Public goods are service provided for a large number of citizens, meaning the private sector is potentially constrained to produce and distribute such a service equitably and efficiently, which justifies government involvement, whether in production, finance, or regulation (Grout and Stevens 2003). According to Tobin (1970) and Lament and Favour (2007), it is essential to ensure the reduction of inequality in the distribution of specific goods or services among the members of society in order to maintain an acceptable level of welfare of the people.

Pure public goods are also goods that either the private sector will not supply or, if supplied by the private sector, will be insufficient, for example, defence, police, street lighting, and public administration (Stiglitz 2000; Connolly and Munro 1999). While public goods have a property of non-exclusion from consumption, private goods have properties of rival consumption and excludability. Some goods have non-rival properties, but exclusion is possible, for example, a toll road. Suppose there is no charge for such non-rival goods, inefficiency sets in, which also does not provide incentives to supply the goods. Thus, roads are categorized as non-excludable goods; fees are often charged where exclusion is possible (provision of an alternative route).

Roads and highways are not pure public goods, and so can be provided by the private sector (Stiglitz 2000). Connolly and Munro (1999) postulated that the private sector might supply some public goods, for example, roads. However, the cost of excluding people from using it may be expensive because there will be a need to provide alternative routes. If roads are provided solely by the private sector, one class of society may benefit from the use of the road more than the others, as it relates to the

affordability of road charges, since private investors will want returns on their investment. Also, the market may not be able to provide enough of the road services for public use, which constrains equitable distribution. For this reason, a government must undertake the development of the road infrastructure and make it available to all classes of society in an equitable manner. Furthermore, the highway infrastructure generates negative and positive externalities along the corridors because it comprises and interacts with a whole range of networks of activities (Yang and Lim 2008). Hence, the issues affecting its sustainability are better addressed by governments.

However, government failures can also occur; for instance, in the case of Ghana, the government of Ghana cannot provide an adequate and good quality road network, thus paving the way for the return of the market. This argument is relevant in discussing the Ghana roads sector because, as highlighted, the government of Ghana's failure has occurred because the government does not have the financial resources to develop all the road networks that will bring comfort to the citizen and enhance the economic aspirations of the country. Besides, the government's intervention in providing roads often ends in a disappointing result, ranging from the poor quality of the roads or uncompleted and abandoned road projects, which have been the primary cause of road accidents, as already mentioned.

The perceived government failures in providing good roads that connect to the neighbouring countries, regional and district capitals, major industrial hubs, business, and tourist centres, call for the introduction of private investment in delivering roads and highways in a partnership with the

2.12.2 Project Viability Test

For a PPP project to be considered viable, it has to be profitable and for the long-term (Osei-Kyei and Chan, 2018b). The project viability test is critical to determine whether or not a project will proceed to procurement through the PPP route. It has been suggested that both technical and economic feasibility in PPP are interlinked in that technical appraisal in the area of specifications, time scheduling, and technology will affect the economic sustainability of the project in terms of its smooth operation to achieve the strategic objectives of the project (Weber and Alfen 2010; IBRD 2017).

Assessing the economic viability of a project to ascertain its bankability is crucial and critical. According to Ahmadabadi and Heravi (2019a), the success of PPP projects hinges on a feasibility study that addresses the fundamental issues. Economic assessment of a project has the following key

elements: capital requirements, investment volume for construction and commissioning, current operating cost, income generated by the project, cost of materials, and cost of project analysis (World Bank, 2009). The economic potential of a PPP project is based on project selection through sound economic analysis. In Germany, for instance, the public sponsor in error selected projects that generated only a low level of traffic, leaving the projects with high traffic volume to be financed through conventional means. This led to very low project implementation until 2005 despite the availability of the necessary legal framework. Thus, the financial model needs to show that the project is viable for financing, which is the assurance needed by the project financers.

Also, a project must have a positive net present value (NPV) over the project finance period. NPV is the summation of total positive and negative cash flows discounted; that is, the sum of the project's cash flows over the project's lifetime (Cruz and Marques 2014; Odeck and Kjerkreit 2019). If the project is economically viable, it will indicate a positive NPV, which is the infrastructure economic value. On the other hand, if the NPV less than zero, it means that the resources consumed by the infrastructure or service are higher than the benefits generated (Cruz and Marques, 2014).

2.12.3 Affordability Text

Affordability, on the one hand, relates to whether the public sponsors can pay for the services fee as in the case of PPP (as in social infrastructure) or the case of availability payments. On any toll concessions PPP project, the user fee has to be affordable by users. Sound advice is needed on costs, financing, and usage to ensure that the affordability limit is not breached. The affordability criterion is essential before there can be any progress in the procurement stages. Preferred bidders should not be appointed until the issue is resolved in order to reduce scope in the case of it not being affordable. However, service fees should not be manipulated to an abnormally low level at the beginning of the PPP contract. Studies by Standard and Poor (2006) globally, suggest that traffic forecasts for toll roads, bridges are at times overestimated in the first year by 20 - 30%.

In a long-term PPP, the traffic risk is too complex to be borne by the concessionaire alone; for example, in an integrated/meshed motorway network, a change in price policy or the addition of a stretch of road on one part of the network can affect the other aspects. The level of uncertainty in the traffic projection of PPP concessions is generally high because of the long duration of the concession period. Capping toll revenue can alleviate the commercial risks to the concessionaire, including

controlling the rate of return or the application of a variable concession period. Nonetheless, the structure of the tariff has implications for the project's cash flow; hence, flexibility should be embedded in the contract for possible adjustment as the situation demands to enhance project viability (Kwak et al. 2009). Levy (1996) argued that the financial analysis of BOT must show adequate revenue projection that demonstrates financial viability for the entire life of the project for it to be attractive to the private sector. However, there can be flexibility regarding these, as individual factors may limit total adherence to the criteria, especially in many developing countries where private capital seems to be the only option for the development and improvement of highways as an alternative provision to the public purse or when foreign aid is unavailable.

In rare cases where funds are available, a critical consideration is given to concerns regarding a government's inefficient fiscal management leading to the choice of private finance (Richards 2005). Similarly, in many countries, the critical criterion for using PPP is to remove the project from the government's balance sheet (OECD 2008), and in such a case, the value for money consideration is often compromised. The scenario painted by Richards and the OECD applies to the phenomenon being considered in this study, where inadequate funding has nearly halted public investment in the improvement and development of roads and highways.

The user charges should be affordable by the users. At the same time, alternative routes are to be provided for those road users who either cannot afford the user fees or are not interested in using the toll road. The public must be provided with the opportunity to choose between the available road provided by the government through their social responsibility and the private provision driven by profit motives. The perceived government failures in providing adequate public services, for example, good quality roads, as relevant to Ghana in this particular instance, are prompting the emergence of public choice theory. Choice means the ability or autonomy of the consumers to take an independent decision on what product to buy and from whom, and where, when, and how to buy it, while competition means that there are many providers in the public service, which attracts or motivates users (Le Grand 2007). Private investment in roads through tolls should provide alternatives for road users or other toll-free alternative routes that the government may provide.

2.12.4 PPPs and Public Interest

The public interest is a significant consideration in the provision of public service, in which any PPP intervention must be seen to satisfy (Sharp, 2005). The issues relative to the public interest test outlined by Cartilidge (2006) and (Sharp, 2005) in PPP project implementation include openness and accountability and consultations. According to Sharp (2005), preliminary public interest analysis is usually undertaken at a very early stage of the project cycle, and then a more thorough assessment is completed later. PPP projects must address public interest by providing adequate consultation before the implementation to assess the potential impact on the residents and the general public at large. Earlier public interest consultation will prevent the confrontation from the public and trade unions (Cartilidge 2006).

2.12.5 Value for Money Test

The pivot on which the PPP initiative is measured is the ability to achieve VfM. Researchers have defined VfM differently. For instance, Ameyaw et al. (2015) defined VfM as what a government judges to be the optimum performance of infrastructure and price expected over the lifetime of the project. However, Cruz and Marques (2014), are of the view that VfM is the usefulness of public money spent. Both descriptions of VfM has features that interest the public, both as taxpayers and also the beneficiaries of public services. Hence, it is the driving force behind the PPP method (Burger and Hawkesworth, 2011). VfM tests the net value that the government engaging the private entity receives from a PPP project. The assessment of the value helps the government to decide whether a project should be implemented as a PPP and how much support the government should provide to the project (Delmon 2017). However, Ameyaw et al. (2015), cited that certain benefits of a PPP project are difficult to price; therefore, CBA is not the best approach to assess VfM.

2.13 Infrastructure Financing

Traditionally, governments have been responsible for the provision of public infrastructure. However, this position is changing because of budget constraints, particularly in developing countries. The economic restrictions have compelled governments to look for alternative financing arrangements through the PPP vehicle to accelerate infrastructure development and economic growth (Perera 2017), create jobs (Ministry of Finance 2019), raise the quality of infrastructure (Ullah et al. 2016), and reduce inflation (HM Treasury 2012). The most current sources of financing for infrastructure are

government financing, project financing, and corporate financing (Yescombe 2002). These sources are discussed in turn in the subsequent sections.

2.13.1 Project Financing VS Funding

The (European Investment Bank [EIB] EIB 2010) and Abelson (2016) defined financing as the money required up-front to meet the costs of constructing infrastructure. Governments typically source financing through surpluses or governments borrowing for infrastructure procured through the traditional method or by the private entity raising debt and equity finance in the case of PPPs. Funding, on the other hand, generally refers to the source of money required to meet payment obligations (APMG 2016). In the context of PPP, it relates to the source of money over the long-term to pay the PPP private partner for the investments, operating costs, and maintenance costs of the project. Traditionally, funding is sourced from taxes (in government-pays PPPs) or user charges (in user-pays PPPs). This study is limited to a financing mechanism where the private entity is responsible for raising and providing all or a significant portion of the financial resources for the financing of a road infrastructure project, which includes design finance and construction through to completion of the road infrastructure. Except the host government providing part of the finance, that is if the scheme is a co-financed PPP.

2.13.1.1 Project Financing

The most common process of financing PPP is to use the "project finance technique." De Marco and Mangano (2017) stated that it is a financing system in which infrastructure is developed with funds from outside the public budget allocation. It helps in addressing the scarcity of public funds and the lack of control by the public sector (Kang et al. 2011). Project financing is not a new concept, as it has been practised globally for some time now (Crozet 2014). Project financing has been promoted by some international institutions, including some multilateral organizations for major infrastructure projects (Yescombe 2002). The role of financial institutions, both local and international, are critical in project finance, as they help to channel capital for infrastructure development (Foster et al. 2010).

Yescombe (2010, p. 113) defined project finance as "a method of raising long-term debt financing for major projects." Further, Yescombe (2010) indicated that project financing is a form of financial engineering, which is grounded on borrowing against the money from the project and upon a detailed evaluation of a project's construction, operation, and revenue risks, and their allocation between

investors, lenders, and other parties through contractual and other arrangements. From this line of reasoning, Power et al. (2015), Yescombe (2010), Pinto (2017), and EIB (2010) asserted that project financing is structured financing of infrastructure, where the sponsors are created by means of share capital, and for which the financer also considers cash flows as the source of loan reimbursement, whereas project assets represent only collateral.

2.13.1.2 Characteristics of Project Finance

According to Pinto (2017), project finance has five distinctive features, which are:

1. the borrower is a project company, in this case, the SPV, which is economically and legally autonomous from the sponsors, i.e., the project companies are standalone entities;
2. the financiers have only limited, or no recourse to the sponsors – the extent, amount and quality of their involvement is limited;
3. the project risks are allocated to those parties that are best able to manage them;
4. the money from the project must be sufficient to cover the operating cash flow and service the debt and interest payments; and
5. sponsors give collateral to financiers as security for cash inflows and assets tied up in managing the project.

2.13.1.3 Sources of Funds for Project Finance

The primary sources of funds by a project company in any corporate finance structure are through; debt or equity (Delmon 2016). As pointed out by Delmon (2016) and Yescombe (2010), debt and equity. There are several sources of funds for project financing. However, this study is limited to equity and debt financing, as it is the primary source of financing infrastructure projects.

2.13.1.4 Debt Financing of a Project

Debt is the borrowing of loans from companies, such as banks or financial institutions to support a business's operations; in this case, the financing of an infrastructure project. Debt is typically in the form of loans or bonds. Mainly, private sector project finance debt is provided from two primary sources, commercial banks and bond investors (Yescombe 2010; APMG 2016). Commercial banks are the most common source for project finance as they lend to project companies for the long-term for infrastructure development (IBRD 2017; Delmon 2016). Further, IBRD (2017) mentioned that

lenders to PPP projects in developing countries might include multilateral and bilateral development banks and financial institutions, and institutional investors such as pension funds and insurance companies. Additionally, debt can also be provided by the capital market in the form of bonds. Bonds are a tradeable debt investment in which an investor loans money to the private partner for a defined period at a variable or fixed interest rate for the development of a project. The security for a debt is primarily limited to the project asset and future revenue stream (Delmon 2016).

2.13.1.5 Equity Financing of a Project

Another way of financing a project is through equity. Equity may take the form of pure equity or capital shares, and quasi-equity products (junior or subordinated debt, mezzanine debt, and others); these are senior to the equity shares but subordinated to the (senior) debt or main debt. For new projects in developing countries, the leading equity provider is usually the contractor. Most of the construction groups have a dedicated arm or subsidiary to manage their PPP business and to invest equity in the SPVs for their projects. However, Delmon (2016) asserted that an equity contributor might include local investors, other interested government institutions, and bilateral or multilateral organizations. In some occasions, the government may invest in equity shares in the SPV, acting as a financial partner, with the investment coming directly from the procuring authority, or through the structured funds of a trustee or by strategic investment funds.

2.13.2 Government Financing

The source of government or public revenue for infrastructure development is through revenues, that is, monies received by the government in the form of royalties, taxes, penalties, and fines. In a situation where the financial viability of the project is not enough to attract appropriate private sector finance, or there is an opportunity to improve value for money, a government can borrow money and provide it to the project in the form of grants, subsidies, or guarantees of indebtedness (Delmon 2016). Indeed, a sovereign government will be able to obtain financing at a lower cost than a private entity can (Yescombe 2010). However, the cost-effectiveness of government financing will depend on the credit profile of the government in question (as reflected in its credit rating) and any other restrictions that apply to that government about assuming new debt obligation. Hence, governments with a poor credit rating and higher debt-to-GPD ratio resort to the PPP approach for infrastructure development (Zhang 2017).

2.13.3 Corporate Financing

A company can borrow money against its proven credit profile and on-going business and invest it in the project. The size of the investment required for an infrastructure project and returns that such companies seek from their investments may result in a relatively high cost of financing and therefore, can be prohibitive for the contracting agency (Pinto 2017).

2.14 Special Purpose Vehicles (SPV) for PPPs

In most cases, a PPP operates through an SPV. Thus, loans are made directly to the SPV. A typical project structure for SPVs is presented in Figure 2.4.

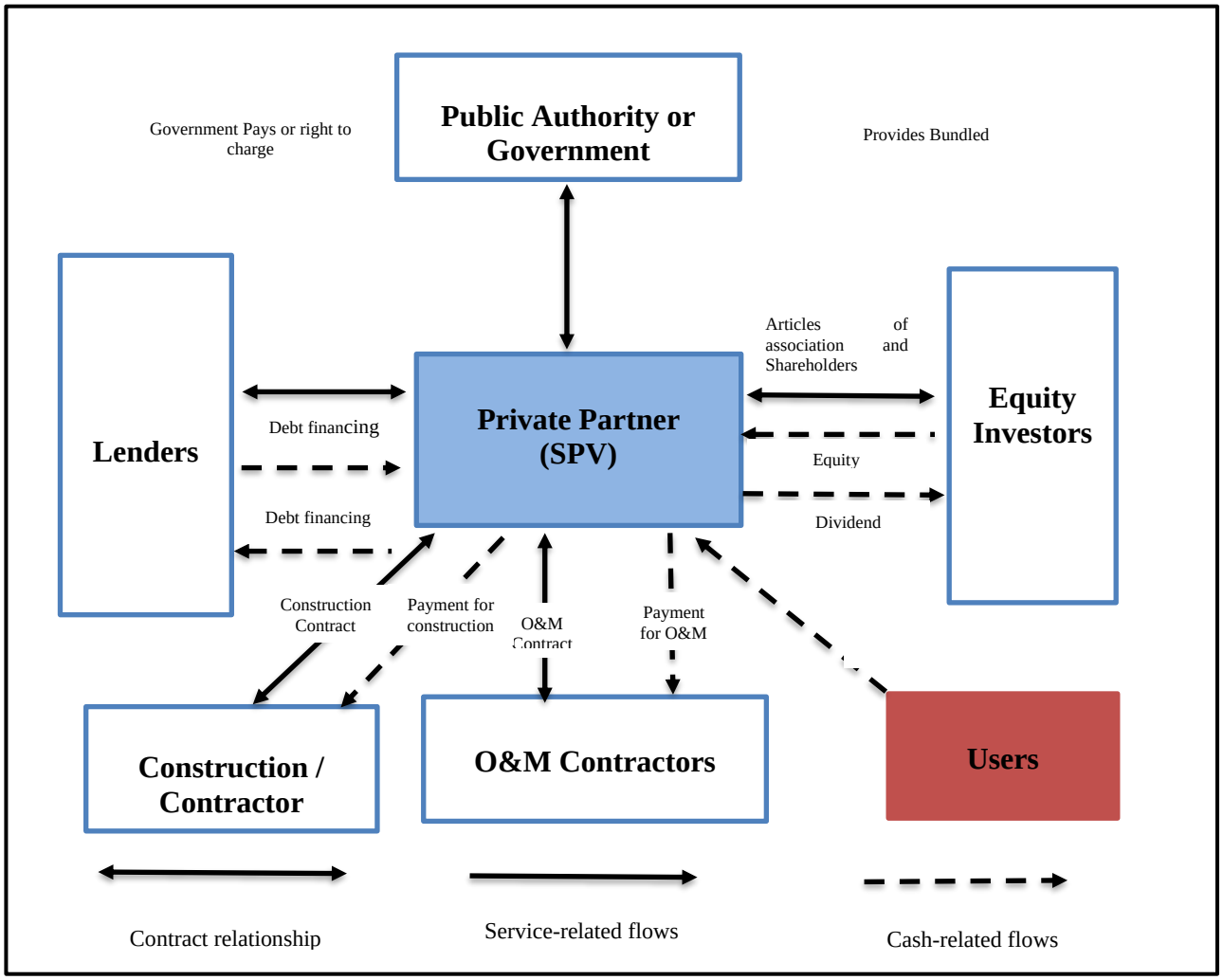


Figure 2- 4: Typical SPV arrangement for road projects

Source: adapted from APMG (2016) and Yescombe (2007)

As shown in Figure 2.4 above, conventionally, the government, through its agent, will award the contract to a company or group of companies (consortium). After the awarded of the contract, the consortium will have to incorporate a specific company, usually called the SPV, under the relevant legislation of the host country. The SPV will then sign the contract with the procuring authority (which is usually called "commercial closing"), and the consortium members will execute the shareholder agreement with the equity investors. By signing the contract, the private partner assumes the obligations described in the contract to undertake the following: 1) finalize the design of the infrastructure and construct or develop the infrastructure asset; 2) finance the works and other development costs, and 3) operate and maintain the asset (after commissioning the asset and obtaining the necessary approvals and authorizations).

2.15 Road Financing in Ghana

As cited by Shendy et al. (2011), in many African countries, road infrastructure is financed by the central government through revenue generation and donor support in the form of loans or grants from bilateral and multilateral organisations. Ghana is not an exception. In Ghana, the government is the main financer of road infrastructure development. The sources of funding for road development are monies from the Road Fund and the Consolidated Fund (Ignatius and Buertey 2014). Inflows from these sources are, however, inadequate to provide the needed financial resources for infrastructure development. It is estimated that the amount required for the roads sector alone amount to US$ 400 million per year (MoF 2019). In 2019, the government, as part of its key policy initiatives and critical expenditures, spent approximately Ghana Cedi (GHS) 862,631,944 (equivalent US$ 179 million) on road infrastructure development (MoF 2018). The disparity between the road deficit and the actual expenditure is a significant concern. This disparity is attributed to the deficit to inadequate government revenue to fund capital projects (Shingore 2009).

Ghana government inability to meet the increasing demand in road development is mainly due to monetary factors, just like the other developing countries that are unable to mobilise enough revenue (Levy 1996). Ghana, like many African and developing countries, is short of funds to finance road infrastructure. Funding for roads in Ghana is decreasing due to the inability of the government to raise more funds through revenues, and donor support, which has been the primary source of finances to middle-income and low-income countries (Badu et al. 2012). Nonetheless, the non-availability of

funds to develop the significant road arterials have created a considerable gap in road development in Ghana, leaving a road network unable to supporting the socioeconomic activities it was intended to support (Bakari, 2017; Siyan et al. 2015; Mbulawa 2017).

In recent times, many major road networks in Ghana have been developed through funding acquired in the form of loans or grants through bilateral and multilateral support from donor agencies (Nana-Benyin 2011). Agencies, like the International Development Association of the World Bank (IDA), the AfDB, the Overseas Economic Co-operation Fund of Japan (OECF), the European Union (EU), the Export Credit Guarantee Department of the UK (ECGD), the Japan InternationalnCo-operation Agency (JICA), the Arab Bank for Development in Africa (ABDA), Agence Française de Développement (AFD) and the United States government through the Millennium Development Authority (MiDA), have been of significant help in the road infrastructure development of Ghana (Acakpovi et al. 2018). The traditional way of financing road project adopted from the British colonial rule since independence has not seen any significant deviation.

The abysmal performance of the traditional financing method is a significant cause for concern amongst clients and all the stakeholders. It is prevalent in Ghana for contracts to be terminated due to delay payment to contractors which results in shoddy work and non-performance by contractors, and projects are often delayed due to bureaucracy in processing payment to contractors. The World Bank (2003) indicates that the process for payment to contractors involves over 30 steps from invoicing to receiving the payment cheque. This is an indication of the public sector's deficiency in its procurement responsibility (Ofori, 2007) which calls for proactive governance and alternative approaches to the procurement strategy selection.

2.16 Challenges Affecting the Implementation of PPPs

2.16.1 Introduction

PPPs have been accepted globally as an alternative way of procuring infrastructure. Notwithstanding the global acceptance of PPPs and their increasing usage for infrastructure development, experience and stories about the use of PPPs in both developed and developing countries have not always been positive (Kwak et al. 2009; Osei-Kyei and Chan 2017b). Several PPP projects are either stalled or terminated, particularly in developing countries, as a result of implementation challenges (Babatunde

et al. 2015). On account of the abovementioned, countries new at adopting PPP must assess the challenges that have the propensity to impede PPP implementation. With this background, this section explores some of the challenges affecting PPP implementation.

2.16.2 PPP Implementation Constraints in Developing Countries

Since the introduction and acceptance of PPPs, many researchers have carried out some significant studies to understand the challenges of PPP application. For instance, a survey conducted by Osei-Kyei and Chan (2017b) on PPP constraints in developed and developing countries found out that the key challenges that hinder the implementation of PPPs in developing and developed countries include lack of experience and appropriate skills of the public sectors officials, political instability, and lack of political commitment and support for PPPs. Osei-Kyei, Chan and Dansoh (2017), also mentioned corruption, lack of transparency and competition, public unrest are some of the challenges facing PPP implementation in developing countries. Akintoye (2009) and Shendy et al. (2011) identified unaffordable projects, public sector resistance to innovation, public sector resistance to long-term relationships with the private sector, and lack of long-term denominated debt financing as some of the issues hindering PPP implementation in some developing countries.

High user charges have been identified as one of the challenges of PPP implementation as it forces users to look for alternatives, particularly to toll roads. This reduces the traffic volume and makes the PPP project not commercially viable. Other reported PPP implementation challenges in developing countries cited by Loxley (2013) and the World Bank (2012) include a lack of competition in the procurement process, unstable macroeconomic. It has also been argued that imposing a cost on social services, which should be moderately priced, has been one of the crucial reasons for public opposition and resistance to PPPs, especially toll roads (Nikitas et al. 2018).

In the context of Malaysia, using a questionnaire survey, Ismail and Haris (2014) investigated the constraints in PPP implementation. The study revealed 14 constraints that hinder PPP implementation in Malaysia; out of the 14 constraints, the five critical constraints that most of the survey participants considered as being a hindrance to the adoption of PPP were “lack of government guidelines and procedures,” “lengthy delays in negotiation,” “higher charge to the direct users,” “lengthy delays because of political debate,” and “confusion over government objectives.” Carbonara and Pellegrino (2014) also conducted a study using both quantitative and qualitative approaches to understand PPP

in Italy and discovered that PPP implementation in Italy was less productive, less efficient, and slower than in other countries because of administrative issues. They further stated the three main factors which slow down the use of PPP are the complexity of the administrative procedures, the difficulty of regulating through contracts a proper allocation of risks, and the high administrative risk characterizing the adjudication procedures.

2.16.3 PPP Implementation Constraints in African Countries

African countries have country-specific challenges. The challenges confronting PPP implementation in Africa have also been outlined by Akinsanya (2000) and Oluwaseun and Odun (2014) as strong ideological opposition, fear of job loss, opposition from politicians and government officials from an expected loss of substantial power patronage derived from current control, and fear of domination of privatized entities by large corporations. Leigland and Roberts (2007) and the World Bank (2014) also mentioned the lack of adequate project preparation and the need to produce well-packaged bankable projects that will attract private investment as other challenges to infrastructure investment in Africa; where project proposals are backed by outdated engineering studies devoid of any feasibility and cost benefits analysis that address social, economic, financial, technical, environmental, and administrative factors. This position was corroborated by Ncube (2013) in a study to examine the infrastructure deficit and financing needs in Africa within the context of the post-2015, in which he indicated that for African countries to address their infrastructure deficit, they have to address deficiencies in planning, project management, institutional inefficiencies and regulatory bottlenecks.

An in-depth study conducted by the World Bank (2011) on PPP revealed that some of the challenges to successful PPP implementation in Africa were the high cost of local debt and shorter tenures, optimistic cash flow projections, and governance and accountability weaknesses. It has been identified that PPP success requires well-developed financial markets; a stable currency and an interest rate and rate of borrowing from the commercial banks that are relatively low will increase the attractiveness of the PPP market to private investors (Kavishe et al. 2018; Ismail and Harris 2014). Nevertheless, these are still underdeveloped in Africa and, as a result, impede the implementation of PPP within the continent. Shendy et al. (2011) corroborated this and indicated the excessive shortage of long-term locally denominated debt financing as a major financial constraint in Africa.

Additionally, in most African countries, the institutional and sound legislative frameworks which will insulate the private investor from financial losses are either fragile or are not in place (Zangoueinezhad and Azar 2014; Shendy et al. 2011).

A study conducted in the Tanzania housing sector by Kavishe (2018) also cited inadequate PPP skills and knowledge of public officials, inadequate legal framework, misinformation on the financial capacity of private partners, a lack of competition, corruption, and an inadequate feasibility study as some of the challenges. From the Nigerian perspective, a study to investigate the barriers to PPP by Babatunde et al. (2015) identified 58 barriers to PPP. However, the five most critical were potential conflicts of interest among the stakeholders, the politicization of the concessions/political interference in the procurement process, the uncertainty of the political environment/political instability, a lack of transparency and accountability, and the inability of local institutions to provide long-term financing/equity financing.

2.16.4 Constraints that affect Road Development in Ghana

A road can only fulfil and maximize its lifespan when it is managed and maintained correctly, but this discipline is lacking in Ghana. Failure to provide an adequate, sustainable road network hampers economic growth in any country where the preoccupation of the professionals and the government is not to procure a new and sustainable road network to improve the strategic location of the country (Robinson 2008). Further, Robinson stressed the need to address institutional, management, and financial issues over technical issues to achieve improvements to the road network. Akintoye (2009) argued that the fact that the private consortium in a PPP project takes control of the financing, design, construction, and operation of the scheme allows the introduction of innovations that will ensure the sustainability of the service provision. While the literature on PPP constraints in Ghana is limited (Osei-Kyei and Chan 2017b), some major challenges militating against road infrastructure development in Ghana are discussed further under the following sections.

2.16.4.1 Political Influence

The influence of the political elite in Ghana construction industry cannot be over-emphasized. However, there is no empirical evidence to explain the influence of politics on road infrastructure delivery in the country. Therefore, it is difficult to draw any conclusions on the influence of politics on road development in Ghana. However, research conducted by Jaselskis and Talukhaba (1998)

cited by Laryea (2010) on procurement processes in developing countries concluded that governments in developing countries have a direct influence on construction in both the public and private sector through their behaviour, policies, and legislation. As in many other countries, the government of Ghana is the major road construction client. Therefore, it is hard to disconnect the influence of government and politics from road infrastructure delivery in Ghana (Eyiah and Cook 2003). A recent study by Osei-Kyei and Chan (2018b) to understand the public sector perspective on PPP policy implementation in Ghana and Hong Kong, confirmed political interference as one of the risk factors that is confronting Ghana. This was corroborated by Ameyaw and Chan (2015), who found out that political interference is a risk Ghana needs to face, in its bid to pursue the PPP route. As cited by Cheung (2009), political interference caused the "West Kowloon Cultural District Project" in Hong Kong to be put on hold for many years. This experience indicates the negative impact that political interference could have on the implementation of PPPs in Ghana.

2.16.4.2 Organisational Culture

The public sector in Ghana is characterized by corruption, mismanagement, lack of logistics, poor services, arrogance/insensitivity, nepotism/ethnicity, and inequalities (Levy 1996). Another critical challenge that eventually could harm PPP implementation in Ghana that needs to be dealt with is the poor organizational culture, and the orientation of the public sector works. As mentioned in a study by Damoah and Akwei (2017), the reason for the failure of government projects in Ghana can be attributed to the poor organizational culture. Further, Damoah and Akwei opined that public sector workers' attitude towards government work is weak, and this can be traced back to cultural orientation during the colonial period. For instance, Amponsah (2010) mentioned that the failure of Ghanaian government projects is attributed to colonial rule when public sector work was perceived to belong to the "white man" and, as such, could be handled haphazardly. This mindset, if not change, could be a source of concern to private sector investors, whose aim is to bring business efficiency and effectiveness to public sector service delivery in PPPs (Oluwaseun and Odun 2014; Jefferies 2006 and Wang and Sun 2016).

2.16.4.3 Budget Constraints

The government's inability to meet the increasing infrastructure demand in Ghana is mainly due to monetary factors just as in other SSA countries that are having problems in raising enough revenue (Levy 1996). African governments are short of funds to finance road infrastructure; the budgetary

allocation to road maintenance rarely exceeds 30% of the requirement and very little or, in most cases, no revenue is generated from the road users (Heggie 1995). This is the position in Ghana. Road funding in Ghana is decreasing due to the inability of the government to raise more funds through revenues, and donor support, which has been the primary source of finances to middle-income and low-income countries, has also declined in Africa (Badu et al. 2012).

2.16.4.4 Corruption

Globally, the act of corruption is seen as a major risk in the construction industry. It has been argued that corruption reduces the performances of the construction industry by inflating costs and reducing the quality of the infrastructure projects (Ameyaw et al. 2017). Studies have discovered that VfM during the procurement of government- and donor-funded projects are not achieved because of corruption-related practices (Mawenya 2008; Osei-Tutu et al. 2010). A worldwide survey on corruption estimated that the volume of bribes that exchange hands through public sector procurement is between $390-400 billion per year (Lengwiler and Wolfstetter 2006). Osei-Tutu et al. (2010) and Mawenya (2008) corroborated this position in the context that corruption in SSA accounts for up to 70% of public procurement contracts, and such corrupt practices have a direct influence on project costs, thus inflating project costs by about 20-30%. A study conducted by Ameyaw et al. (2015) in the Ghanaian construction industry concluded that systemic corruption and unethical behaviour prevail among public officials during the bid evaluation, tendering, and contract implementation stages. Similarly, a study by Chan and Ameyaw (2013), specifically on the challenges influencing PPP water projects in Ghana, discovered the act of corruption as one of the significant challenges affecting PPP implementation in Ghana.

Given the above, it stands to reason that corrupt practices could be a significant challenge that Ghana must tackle head-on during the implementation of PPPs. Other authors have consistently identified corruption during procurement and inefficiencies as one of the reasons for the dismal outcome of the road industry, and they call for private sector involvement. Lack of transparency, inadequate attention to maintenance, delays in executing the road project, which in most cases, results in the road project being abandoned, have also been identified up by commentators in developing countries and Africa (Djoen San, & Soeng 2016; Emeasoba et al. 2013).

2.16.4.5 Method of Procuring Road Projects in Ghana

The procurement practices being practised in most African countries were borrowed from their "colonial masters" (Ren et al. 2012). The Ghana construction industry is not an exception to this practice. TPM, inherited from the British, has long been in use for the procurement of road projects in Ghana with no significant variation to date. This method of procurement has been identified as producing disappointing results, such as the delay in the delivery of road projects, contractual claims, contractual disputes, time and cost overruns, and a lack of funds to pay contractors for work done (Ren et al. 2012; Kwofie et al. 2016). Hence the need for innovative and progressive procurement method.

2.16.4.6 Pricing and Cost Recovery System

Roads are a public asset in Ghana and, as such, are financed through the public purse and, in most cases, without any form of financial obligations from the users. As previously noted from various authors (refer to section 1.2), the dwindling financial capacity of the government is straining the budgetary provision available for its sustainability. Therefore, it will require a market-based approach with fair pricing for it to be sustained and bankable. The bankability of projects is of utmost importance to the lender, who is interested in the revenues as a form of security (Word Bank 2009). According to the World Bank, Africa has witnessed a low turnout of private sector financing in infrastructure delivery, especially roads, due to the unpredictable financial return as opposed to the case of mobile telecommunications and energy, which have no legacy of below-the cost pricing. The main attraction of the private sector to toll road investment is the perceived ability of such investment to generate enough revenue to cover capital and recurrent costs that will ensure the continued maintainability of the facility without recourse to the public purse (Robinson 2008). Therefore, roads should undergo a full cost recovery system where revenue is linked to expenditure without any external subsidies or other transfer payments in order to encourage strong market discipline (Heggie 1995).

As discussed in section 2.4, PPP projects are country-specific. Therefore, the challenges identified from the review of the literature, as presented in Table 2.2 to 2.5, are for the general construction industry. Thus, they were validated and contextualized in the Ghanaian road construction setting.

Table 2- 2: List of PPP Challenges

No	Challenges	Source															
		Osei-Kyei and Chan, (2018b)	Osei-Kyei and Chan (2018c)	Carpintero and Siemiatycki (2016)	Ortega, de los Angeles Baeza and Vassallo, (2016)	Wentworth and Makokera (2015)	Shendy, Kaplan and Mousley (2011)	Kcang et al. (2019)	Opawole et al. (2019)	Hao, Sun and Lu (2013)	World Bank (2009)	Oppong et al. (2014)	Irving and Manroth (2009)	Kavishe et al. (2018)	(Ismail and Haris 2014)	Osei-Kyei and Chan (2017)	Babatunde et al. (2015)
1	Road users not willing to pay realistic road toll									X	X						
2	Public opposition to PPP road projects			X													
3	Road users using alternative roads				X			X			X						
4	lack of experience and appropriate skills in the public sector	X					X								X	X	X
5	political instability	X	X											X			
6	political interference					X										X	X
7	lack of continuity of PPP road project by successive governments		X									X					

Table 2- 3: List of PPP Challenges Cont.

No	Challenges	Source															
		Osei-Kyei and Chan, (2018b)	Osei-Kyei and Chan (2018c)	Carpintero and Siemiatycki (2016)	Ortega, de et al., (2016)	Wentworth and Makokera (2015)	Shendy, Kaplan and Mousley (2011)	Kcang et al. (2019)	Opawole et al. (2019)	Hao, Sun and Lu (2013)	World Bank (2009)	Oppong et al. (2014)	Irving and Manroth (2009)	Kavishe et al. (2018)	(Ismail and Haris 2014)	Osei-Kyei and Chan (2017)	Babatunde et al. (2015)
8	lack of political commitment and support for PPP road project	X						X							X	X	X
9	absence of clear institutional and PPP legal framework			X		X	X										
10	lack of commercially viable PPP projects to attract investors					X	X										
11	low traffic volumes				X			X		X	X						
12	local banks are not capable of providing long-term finance for PPP road projects.						X					X	X				X
13	lack of strong local capital market						X						X				
14	lack of access to finance for PPP							X									

Table 2- 4: List of PPP Challenges Cont.

No	Challenges	Source															
		Osei-Kyei and Chan, (2018b)	Osei-Kyei and Chan (2018c)	Carpintero and Siemiatycki (2016)	Ortega et al., (2016)	Wentworth and Makokera (2015)	Shendy, Kaplan and Mousley (2011)	Kcang et al. (2019)	Opawole et al. (2019)	Hao, Sun and Lu (2013)	World Bank (2009)	Oppong et al. (2014)	Irving and Manroth (2009)	Kavishe et al. (2018)	(Ismail and Haris 2014)	Osei-Kyei and Chan (2017)	Babatunde et al. (2015)
15	Unstable macro-economic and financial conditions	X	X				X							X	X	X	X
16	lack of strong PPP local market						X									X	
17	lack of transparency in the bidding process	X						X	X					X			X
18	Unstable macro-economic and financial conditions	X	X				X							X	X	X	X
18	lack of trust in public institutions to manage PPP project								X								X
19	lack of transparency in information disclosure							X	X								
20	excessive restrictions on participation														X		

Table 2- 5: List of PPP Challenges Cont.

No	Challenges	Source															
		Osei-Kyei and Chan,	Osei-Kyei and Chan	Carpintero and Siemiatycki	Ortega, de Los Angeles	Wentworth and Makokera	Shendy, Kaplan and	Kcang et al. (2019)	Opawole et al. (2019)	Hao, Sun and Lu (2013)	World Bank (2009)	Oppong et al. (2014)	Irving and Manroth	Kavishe et al. (2018)	(Ismail and Haris 2014)	Osei-Kyei and Chan	Babatunde et al. (2015)
21	high risk relying on the private sector														X		
22	the high cost of unsolicited proposals	X												X		X	
23	lengthy delay due to political debate														X	X	
24	lack of PPP-enabling environment						X							X		X	X
25	lengthy bureaucratic procedures		X												X		X
28	lack of bankable projects						X										
29	governance and accountability weaknesses						X										
30	high toll charges	X								X	X				X		

2.17 Best Practices for PPP Projects

2.17.1 Introduction

Globally, in particular, developing countries, governments are facing the challenge of financing public services upfront without increasing the debt burden. Thus, they are now looking for private sector investment to supplement or substitute scarce government funds. However, for governments to attract adequate private sector capital for infrastructure development depends on the ability to create the necessary PPP-enabling environment that can attract and sustain the private sector investment. Therefore, this section examines pieces of literature on PPP best practices that attract private sector investments in PPPs. This section defines best practices in the context of this study and subsequently reviews earlier research on best practices.

2.17.2 Best Practices for PPPs

There is no generally agreed definition of what is 'Best Practice. Best practice has been described in many ways by earlier researchers. Best practice factors, critical success factors (CSFs), and factors that attract the private sector to invest in PPP have been used interchangeably. For instance, a best practice framework developed by Osei-Kyei and Chan (2018a) and Cheung (2009) identified their best practice factors from papers that point to CSF. Similarly, a study by Osei-Kyei and Chan (2017b) on the factors that attract the private sector to PPPs also credited research on CSFs. Nonetheless, this study defines best practice as an approach that leads to the successful PPP project implementation in the context of stimulating the private sector to invest in road-specific PPP projects.

Literature suggests that there have been many studies on CSFs that influence the private sector to invest in PPPs projects. Researchers like Osei-Kyei et al. (2014), Babatunde and Perera (2017), Zhang (2004), Cheung et al. (2012), and Kwofie et al. (2016) have discussed CFSs, best practice factors, and factors that attract private sector investments in various ways. For instance, a study by Osei-Kyei and Chan (2017b) on the factors that attract private sector investment in the PPP market of developing countries cited political support, political stability, a favourable existing legal framework, as some of the factors that attract private sector investment.

Available evidence also suggests that investors will invest in a country where there is clear government support for PPPs. As emphasised by Babatunde and Perera (2017) and Olusola et al. (2012), government commitment to and support for PPP projects will increase the attractiveness of the PPP market to private investors. Wang et al. (2018) indicated that government support for PPPs could be in the form of direct support, for example, investment subsidies and revenue subsidies, and indirect support, for example, finance guarantees and demand guarantees. Further, Wang et al. mentioned that considering the gestation period of PPP and the massive capital outlay involved, private investors need assurance from the host country regarding the security of their investment. Therefore, the host government assuring the private investors of their investment will be a significant factor to boost the confidence of the private sector in the local PPP markets.

A project preparation guide by the World Bank detailed some of the factors that motivate the private sector to invest in a local PPP market in Africa as a favourable legal framework, financial viability projects, long-term political acceptance and support, competent PPP units, public sector skills and experience in PPPs, as some of the critical factors that attract investors (World Bank 2009). Fundamentally, private investors respond favourably to simple and clear institutional arrangements where processes and procedures on how to engage with the public sector are established; where the institutional and legal framework set out the rules, mechanisms, and procedures on how PPP should be implemented; and where the ways contract disputes will be resolved are clearly defined (World Bank 2009).

Also, private investors are more confident investing in a country where there are precise methods of interacting with the key public sector entities, and there are simplified processing steps. Therefore, to ensure good project governance, governments must establish institutional frameworks and an incentive structure that reconciles public and private sector values (Reynaers 2014; World Bank 2008; World Bank 2017; Shendy 2011). As outlined by Cheung et al. (2012), an independent, fair, and efficient legal framework is a critical factor for successful PPP project implementation, as it makes PPP projects more attractive by increasing competition; it also reduces investors' perception of risk, making it more likely that the PPP project will be privately financed. In the absence of clear institutional and legal frameworks, the private sector may not be willing to invest in a PPP project.

A good and stable macro-economic environment where the currency is stable and interest rate and the rate of borrowing from the commercial banks is relatively low will increase the attractiveness of the PPP market to private investors (Esther 2009; Osei-Kyei and Chan 2018). Studies undertaken by Babatunde et al. (2012) and Ogunsanmi (2013) in Nigeria and by Abdul-Aziz (2010) on PPPs in Malaysia indicated that appropriate economic policies that will stimulate a stable macro-economic environment are pivotal and, as such, remain the much sought-after success factor by investors and stakeholders in PPPs. Babatunde et al. (2012) and Ogunsanmi (2013) further indicated that sound stable economic policies inspire the confidence and full support of the private sector's interest in PPP projects. Considering the effect of a poor macro-economy on the PPP market, Hardcastle et al. (2006) opined that conscious efforts should be made to maintain a stable economic environment which will eventually lead to reasonable certainty in the PPP market and, consequently, boost the investment confidence of the private sector.

Concession periods for PPPs usually far exceed the term of a government. The government in power has the sovereign right to commit the state to a concession contract/agreement (Kumaraswamy and Zhang 2001). However, after a change of government, a new administration may not have any interest in the project of their predecessors and may revoke the concession agreement or may perceive that they are paying for an infrastructure project that generated political benefits only to others (their predecessors) in the past. Indeed, where the concession or the contract is of a government-pays PPP or where the governments have to provide subsidies, the allocation will need to be made in the national budget, which means it will reduce the current government budgets to develop new projects; thus, the new government may not want to continue with the PPP project (APMG 2016).

The long-term nature of the PPP contracts and the different commercial and political periods that may overlap require long-term political commitment over the extended contract period beyond the term of the incumbent regime. In the light of this, stability is needed in the PPP policy and contract environment; hence, any politically motivated 'shifting of the goalposts' during the contract period will discourage private sector participation in the public sector market (Faulkner 2004). Therefore, building a political consensus on the use of the PPP model, a legal framework to ensure the continuity of PPP projects by successive governments, and having robust termination clauses in the concession contract will assure private investors of the government's commitment to the PPP programme (Federal Republic of Nigeria 2019). In this regard, as mentioned by Osei-Kyei and Chan (2017b), the

government in power and political opposition parties must demonstrate strong support and commitment PPP implementation.

Political stability has also been acknowledged as one of the critical factors investors consider before investing in a country. Indeed, no investor, whether local or international, is willing to invest in a country where there is no political stability (Prasad 2018). Political instability has led to the failure of several initiated PPP projects in various developing countries. It may have deterred investors from investing in future PPP projects, especially in these developing countries. According to Oppong et al. (2014), political stability promotes a favourable investment environment for private investments, and, more fundamentally, private investors are assured of the security of their investments. In most developing countries, political instability occurs during and after presidential and parliamentary elections; thus, maintaining a stable political environment during and after a presidential and parliamentary election will send a positive signal to private investors.

Babatunde and Perera (2017) stated that governments have a responsibility to ensure good governance, which involves elements such as well legal and regulatory quality, administrative efficiency, and independence. Additional factors mentioned by Jacobson and Choi (2008), Biau (2008), and Musawa et al. (2017) include clear planning and a clear vision, long-term commitment, open communication and trust, a willingness to compromise/collaborate, community outreach, expert advice and review, risk awareness, and clear roles and responsibilities as some of the critical factors that can attract the private sector to invest in PPPs. PPPs cannot function in the absence of "good governance", which entails accountability, responsiveness, transparency, equity, and participation (Bovaird 2004; Hofmeister and Borchert 2004).

As pointed out by Zhang (2005b) and Delmon (2016), the success of PPPs depends mainly on the existence of robust local capital markets. PPP funding is mostly from debt, equity, and bonds; therefore, a healthy domestic capital market which is accessible is an incentive to the private sector investor. A lack of funds for PPP projects and a long delay in reaching financial closure because of lengthy negotiations with banks creates an obstacle for the smooth implementation of PPP. Therefore, financing opportunities in a host country is essential to kindle the interest of the private sector in PPP projects (Kumaraswamy and Zhang; 2001; Ameyaw and P.C. Chan 2016; Jerome 2010). As mentioned by Akintoye et al. (2001), financial opportunities for investors are essential because,

during the initial stages of the PPP process, private investors approach different banks to obtain letters confirming that the project is feasible and that banks are willing to back it up.

PPPs require long-term funding (between 25-30 years). Therefore, having a robust local commercial bank that can provide a long-term loan to private investors will increase the attractiveness of the PPP market to local and international investors (Shendy et al. 2011).

Ng et al. (2012) asserted that to attract private sector investment in PPPs, a PPP project should be able to provide adequate revenue from project sources to cover capital, operating, and maintenance costs, as private investors will invest in PPP road projects only when they can recoup their investments within the agreed concession period. From a general project economic perspective, the financial viability (or commercial feasibility) of the project is assessed by determining whether the NPV is positive (Helmersen et al. 2014; Miranda Sarmento 2010). The NPV will be positive if the expected present value of the free cash flow is higher than the expected present value of the construction costs.

2.17.3 Best Practices from Some PPP Road Project

A list of best practices for PPP projects was extracted from the study undertaken by Osei-Kyei and Chan 2018a; Cheung 2009; Kavishe et al. 2018; Babatunde and Perera 2017b; Babatunde et al. 2016; Kwofie, Afram and Botchway 2016). Additionally, a set of factors attracting private sector investment to PPP projects was also extracted from the study undertaken by Osei-Kyei and Chan (2017b).

Ahmadabadi and Heravi (2019) identified six success factors from a PPP highways project in respect of the Khoramabad-Pole Zal and Tehran–Chalus highway projects as follows: 1) favourable legal and political support, (2) available finance market, (3) economic viability, (4) government guarantee and experience, (5) favourable social support, and (6) stable macro-economic climate. These factors were seen to be same as the factors already identified from the literature review, and therefore, they were considered appropriate for the roads sector.

From an African perspective, the N4 toll way from South Africa to Mozambique represents an example of a successful PPP toll road implementation (World Bank 2009). The project originated out of a political will for economic cooperation between neighbouring countries, namely, South Africa and Mozambique. The N4 toll way facilitates increased freight to Maputo port. It is a 30-year PPP

toll concession, ownership of which will be transferred to the governments of South Africa and Mozambique at the expiration of the concession period. Equity was provided by construction firms and the SA Infrastructure Fund as well as Rand Merchant Bank Asset Management and five other investors. Syndicated debt finance was issued by ABSA, Nedcor, Standard Bank and First National Bank, the Development Bank of Southern Africa, and the Mines Employees and Official Pension Funds. The two governments provided a debt guarantee. The increased traffic on the road facilitates greater private foreign investment in Mozambique. As mentioned by Haule (2009), N4 PPP is a good example of Highway PPP in Africa. The World Bank (2009) indicated that there are many lessons for countries in developing countries to learn from South Africa and Mozambique experience. Table 2.6 to 2.10 summarises the PPP derived from the literature review.

Table 2-6: List of PPP Best Practice

No	Best Practice	Sources														
		Babatunde et al. (2016)	Kwofie et al. (2016)	Osei-Kyei and Chan, (2018a)	Odeck, (2017)	Kavishe et al. (2018)	Ahmadabadi and Heravi, (2019)	Osei-Kyei and Chan, (2015)	Cheung et al. (2012)	Babatunde and Perera, (2017a)	World Bank (2009)	Ameyaw and P.C. Chan, (2016)	ADB (2000)	Opawole et al.. 2019)	World,Bank, (2017)	Ortega et al. (2016)
1	Ensure willingness and affordability to pay realistic road tolls are tested			X				X			X	X			X	
2	Ensure all alternative roads are mentioned in the RFP										X					X
3	Training and retaining competent and experienced staff.					X										
4	Stable political environment	X		X				X	X	X				X		
5	Ensure political officers do not interfere in the delivery of projects			X												

Table 2-7: List of PPP Best Practice Cont.

No	Best Practice	Sources														
		Babatunde et al. (2016)	Kwofie et al. (2016)	Osei-Kyei and Chan, (2018a)	Odeck, (2017)	Kavishe el al., (2018)	Ahmadabadi and Heravi, (2019)	Osei-Kyei and Chan, (2015)	Cheung et al. (2012)	Babatunde and Perera, (2017a)	World Bank (2009)	Ameyaw and P.C. Chan, (2016)	ADB (2000)	Opawole et al. 2019)	World,Bank, (2017)	Ortega et al. (2016)
6	Government support through subsidies, insurance and guarantees for PPP projects	X	X	X		X	X	X	X			X	X	X		
7	Favourable institutional and legal framework	X	X	X		X	X	X	X		X					
8	Commercially viable PPP projects	X		X							X					
9	Ensure traffic volumes support PPP project			X											X	X
10	The capacity of local banks to finance PPP project										X				X	
11	Develop a strong domestic capital market for PPPs	X													X	

Table 2-8: List of PPP Best Practice Cont.

No	Best Practice	Sources														
		Babatunde et al. (2016)	Kwofie et al. (2016)	Osei-Kyei and Chan, (2018a)	Odeck, (2017)	Kavishe el al., (2018)	Ahmadabadi and Heravi, (2019)	Osei-Kyei and Chan, (2015)	Cheung et al. (2012)	Babatunde and Perera, (2017a)	World Bank (2009)	Ameyaw and P.C. Chan, (2016)	ADB (2000)	Opawole et al. 2019)	World,Bank, (2017)	Ortega et al. (2016)
12	Available and matured financial market	X		X								X				
13	Sound and stable macroeconomic condition	X	X	X		X	X		X	X		X				
14	Transparency in information disclosures			X												
15	Competition and transparency in the procurement process								X	X			X	X		
16	Address public concerns and perceptions			X												
17	Competent PPP unit								X		X	X				
18	Favourable social and public support	X								X						
19	Political consensus and support on the use of the PPP model									X	X					

Table 2-9 List of PPP Best Practice Cont.

No	Best Practice	Sources														
		Babatunde et al. (2016)	Kwofie et al. (2016)	Osei-Kyei and Chan, (2018a)	Odeck, (2017)	Kavishe el al., (2018)	Ahmadabadi and Heravi, (2019)	Osei-Kyei and Chan, (2015)	Cheung et al. (2012)	Babatunde and Perera, (2017a)	World Bank (2009)	Ameyaw and P.C. Chan, (2016)	ADB (2000)	Opawole et al. 2019)	World,Bank, (2017)	Ortega et al. (2016)
20	Build consensus with opposition political parties			X												
21	Favourable legal and political support											X				
22	Available finance market	X	X	X		X	X									
23	Economic viability	X		X			X									
24	Tariff control policy and available tariff framework				X									X		
25	The extent of foreign currency restrictions													X		

Table 2-10: List of PPP Best Practice Cont.

No	Best Practice	Sources														
		Babatunde et al. (2016)	Kwofie et al. (2016)	Osei-Kyei and Chan, (2018a)	Odeck, (2017)	Kavishe el al., (2018)	Ahmadabad & Heravi, (2019)	Osei-Kyei and Chan, (2015)	Cheung et al. (2012)	Babatunde and Perera, (2017a)	World Bank (2009)	Ameyaw and . Chan, (2016)	ADB (2000)	Opawole et al. 2019)	World,Bank, (2017)	Ortega et al. (2016)
26	A strong and good private consortium	X				X										
27	Right project identification and project technical feasibility	X	X	X		X										
28	Agree on the best approach to resolve disputes and complaints			X												
30	Consider supporting the selected consortium through guarantees			X												

2.18 Conceptual Framework

The last two sections have reviewed and synthesised the literature on factors preventing the private sector from investing in PPP road projects and the best practices that attract the private sector to invest in PPP road project. Based on the outcome of the literature review, this section develops a conceptual framework for the study. According to Jabareen (2009), a conceptual framework is a network or plan of connected ideas that together provide a comprehensive understanding of a phenomenon. Further, Jabareen (2009 pg 57) considered that conceptual frameworks "are not merely collections of concepts but, rather, constructs in which each concept plays an integral role". Jabareen, further argues that the development of a conceptual framework is a process of theorisation, which is based on data generated from multiple sources, which then become the empirical data of the conceptual framework. For this reason, the conceptual framework for this research is based on factors identified in the literature. The researcher envisages that addressing the challenges that prevent the private sector from investing in PPP road projects will incentivise the private sector to invest in PPP road projects.

The PPP arrangement, like any construction project, goes through different phases of the project process cycle. Therefore, in developing this conceptual framework for the roads sector, the adopted approach was based on the PPP project process cycle, which was used by Kavishe et al. (2018) and Osei- Kyei and Chan (2017). According to Kavishe et al. (2018), this approach involves designing systematically and then customising the design to address pertinent issues that need careful attention throughout the PPP process cycle. The rationale for developing the conceptual framework is that some specific challenges are preventing the private sector from investing in PPP road projects in Ghana. Therefore, once the challenges are identified and addressed, the necessary enabling environment for PPP road project would be created and thereby incentivise the private sector to invest in PPP road project in Ghana. The development of the conceptual framework took into consideration the phase of the Ghana PPP process cycle. The PPP process phases are Inception phases, Procurement Phase, Construction Phase and Operation phase. Each of these phases has its inherent challenges that prevent the private sector from investing in PPP road project in Ghana. As shown in Figure 2.5, the development of the conceptual framework began with the identification of the PPP challenges and the best practices from the literature as detailed in Tables 2.2 to 2.5 and 2.6 to 2.10. The conceptual framework will be converted into a refine, validate and final framework within the scope of this

research. The conceptual framework will provide a basis for comparison with the final framework and thereby identify the new knowledge created by the study.

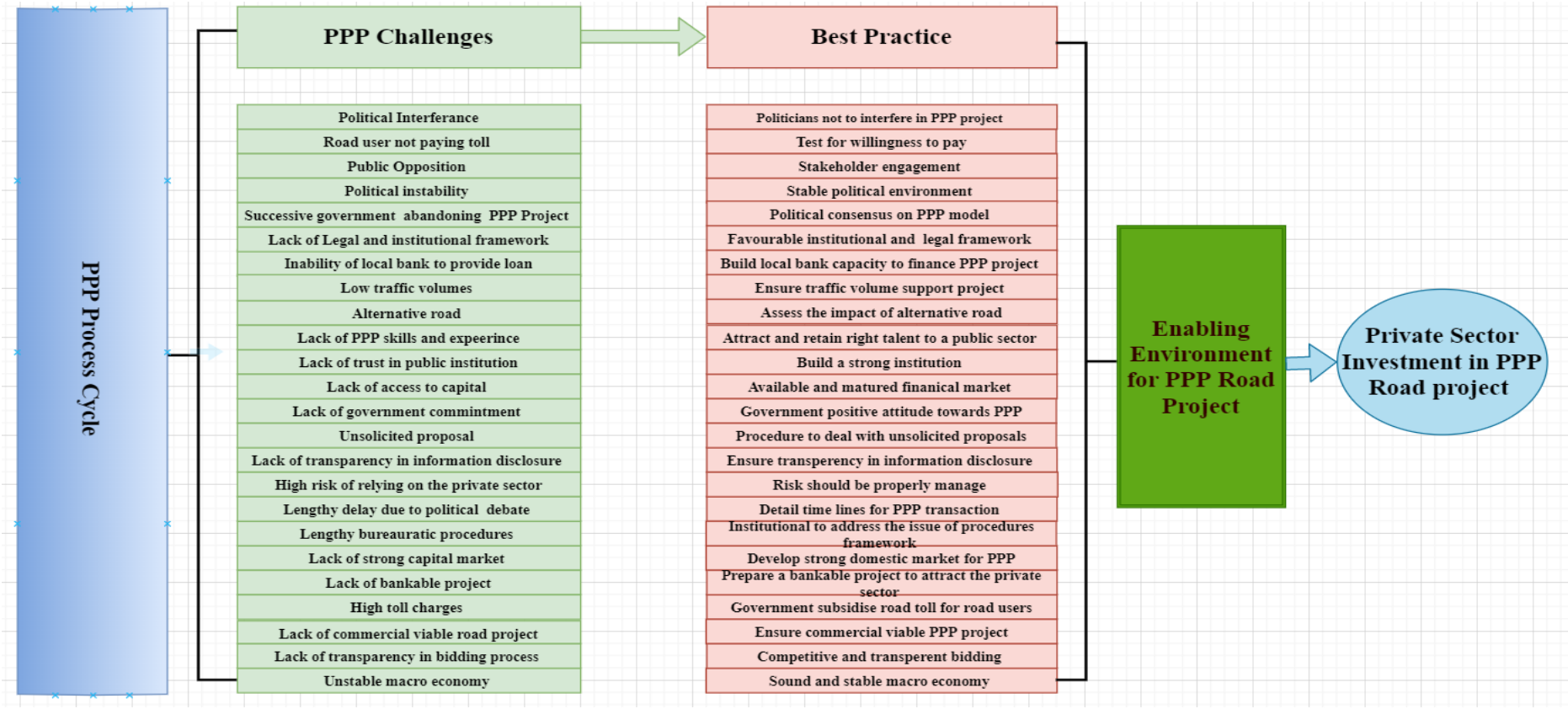


Figure 2- 5: Conceptual framework emerging from the literature

2.19 Chapter Summary

This chapter has reviewed and synthesised literature on the PPPs relative to the research objectives. It came to bear from the review of literature that there is a positive correlation between infrastructure development and the economic well-being of a country. This justifies the adoption of the PPP concept globally as an innovative financing approach for public infrastructure projects. The initial comprehensive review of the literature in the area of PPPs in the construction sector highlighted that the use of PPPs for infrastructure development could be traced back to the 16th century. Since then the PPP practice has been accepted in many developed and developing countries, including African countries. It was discussed that the challenges preventing the private sector from investing in PPP project implementation apply to both develop and developing countries. However, it is eminent in developing countries and varies depending on the jurisdiction and the level of their maturity in terms of PPP applications. Therefore, country-specific challenges of PPPs relative to Ghana were identified.

The chapter also discussed the concept of best practice for successful PPP implementation; it started with a broader understanding of the best practice. It was observed that there was no standard definition of best practice. Nonetheless, earlier studies conducted relative to best practices and factors attracting investors to PPPs depended heavily on research on CSF. The evidence examined revealed that CSF, best practice factors, and factors that attract private sector investment to PPP are used interchangeably. For this reason, this study defined the best practice as a strategy leading to a successful implementation of PPPs in the context of factors that will stimulate the interest of the private sector to invest in PPP road projects in Ghana.

Despite the many prior studies that have investigated PPP implementation challenges and the best practice for successful PPP implementation, there are few studies specific to the Ghana roads sub-sector. To the best knowledge of the researcher, there is no other study concerning the best practices for PPP road projects in Ghana. Hence, this research study aims to fill this knowledge gap by investigating the challenges preventing the private sector from investing in PPP road projects and from identifying the best practices to address the identified challenges for the implementation of PPP road projects in Ghana. Based on the factors identified from the review of literature, a conceptual framework was developed for this study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Chapter Introduction

The research background, research aims and objectives, the rationale for the research, the overview of PPPs and the conceptual framework for the research have been outlined in Chapters One and Two. This chapter explains the research methodology adopted to achieve the set objectives of the study. The chapter starts with a discussion of the research design and the research philosophy. The subjects discussed in the following sections are the research philosophy/paradigm, research approaches, research strategies, research choices, the methodological choices, data collection techniques, and unit of analysis for the research. The chapter presents the details of the philosophy and methodology adopted for the research.

3.2 Research Methodology

The entire process of adopting a research philosophy and framework to solve a problem is known as a research methodology (Ahmed et al. 2016). The earlier position adopted by Guba and Lincoln (1994) was that issues about a study's research methodology were of less importance than questions about which paradigm applies to the research at hand. However, Traver (2002), cited in Awuah (2013), indicated that the research methodology adopted for a study should indicate the theoretical position and methods employed by the research in answering the research questions. Saunders et al. (2016), in a more explicit demonstration, reproduced "The Research Onion" (Figure 3.1), whose aim was to simplify all the aspects of research. This study adopts the research onion and explains the research process that was adopted for this study and the philosophical position of the research, and further states the research approach, methodological choice, and selection of the appropriate strategy for the collection of data and analysis.

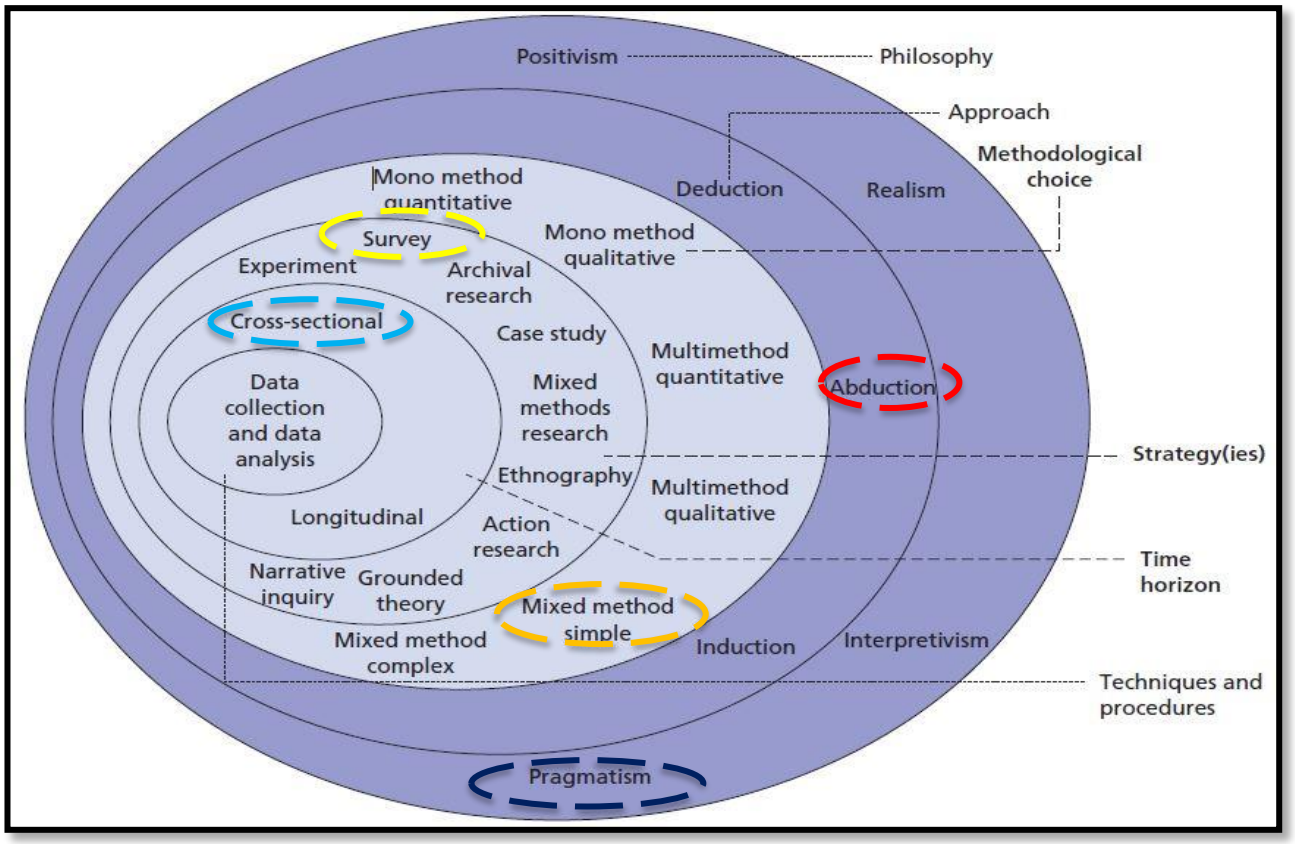


Figure 3-1: Research Onion

Source: Saunders et al. (2016)

3.3 Research Philosophy

The concept of research philosophy has been defined in many ways by researchers. For instance, Saunders et al. (2016, pg 124) defined it as "a system of beliefs and assumptions about the development of knowledge in a field". Further, Saunders indicated that answering a specific problem in an organisation is nonetheless a development of new knowledge. From this line of argument, the philosophical proposition made by a researcher on how he/she selects his/her strategy to address a problem has a significant influence on the study (Saunders et al. 2012). Saunders et al. (2016) identified that consciously or unconsciously, at every stage of research, we make certain assumptions which include assumptions about human knowledge (epistemological assumptions), about the realities encounter in any research (ontological assumptions), and the extent the researcher's values influence the research (axiology).

As cited by Creswell (1994), Each of these assumptions involves significant differences, and that will influence how the research processes are conducted. With any of these applicable philosophical claims, a research inquiry is conducted mainly within three broad paradigms, namely, positivist, constructivist and pragmatic (Creswell 2003). The underlying assumptions of these philosophical positions and paradigms are discussed in the subsequent sections.

3.3.1 Ontology

Ontology is about the nature of reality and examinations of the assumptions about the way the world operates and the commitment to a view; it can be divided into objectivism and constructivism (Saunders et al. 2016). According to Saunders et al. (2009), objectivism focuses on how social phenomena exist independently of social actors. The social structure where the social actors live and perform their role is often independent of the social actors' influence, as these phenomena determine their roles and responsibilities. Saunders et al. (2009) further indicated that objectivism depends upon how the researcher sees the world and cited the management phenomenon as an example that can be viewed independently of the social actors. Subjectivism, on the other hand, is about the creation of social phenomena resulting from the perception and the actions of the social actors (Knight & Ruddock 2008; Saunders et al. 2012). They further explain that the social actors continuously interpret and interact with each other and their ever-changing environment to create the phenomena that are also dynamic. The social actors also tend to make sense of these social phenomena. Saunders et al. (2012) suggested that organisational management is an example of subjectivism, as managers tend to have a specific interpretation and understanding of their jobs.

3.3.2 Epistemology

This aspect of philosophy is concerned with how the researcher gains knowledge of the phenomenon. Epistemology defines the validity of acceptable knowledge in a specific area of research (Knight & Ruddock, 2008). Dawood & Underwood (2010, p. 179) explain that epistemology deals with the "*origins and nature of knowing and the construction of knowledge, and the claims and assumptions that are made about what the nature of knowledge is*". Moreover, it attempts to answer; what the researcher should regard as knowledge to be studied? What are the sources of knowledge? What are

valid beliefs? What are the structures and the limits of knowledge in the proposed area? How can the researcher obtain knowledge? In other words, it establishes the philosophical foundation on which the researcher can judge the validity of the knowledge in a discipline.

Epistemology, as a justification of belief, wishes to find solutions to some questions such as: What makes justified beliefs justified? How can the concept of reason be understood? Whether the justification to one's mind is internal or external? Intuitive, empirical, logical, and authoritarian knowledge are different sources of knowledge from the epistemological perspective (Sarens and Merendino, 2016).

Intuitive knowledge was established on insight, beliefs, faith and others, in which human spirits play an important role compared to dependence on facts. Empirical knowledge depends on the facts of the objects that have established and can be verified (Dudovskiy, 2012). Logical Knowledge is a formation of innovative knowledge using logical reasoning. Authoritarian Knowledge depends on the information obtainable from research papers, books, supreme powers and experts. Knowledge is internally (within) built; hence it is entirely subjective. It is subject to the context and should concentrate on its holistic nature (Moon and Blackman, 2014). Human beings always have interactions with each other because they are social beings by classification.

3.3.2.1 Axiology

Axiology is an arm of philosophy that impact on the value the researcher places on the overall research and the choice of techniques involved (Dawood & Underwood 2010; Saunders et al. 2016). The values possessed by the pieces of research play a significant role in the overall research process and affect the quality of the results, as they are shaped by the objective or subjective criteria, thoughts, beliefs, and experiences of the researcher and are depicted through adopted philosophical positions and research approaches and techniques (Saunders et al. 2012). As stated by Saunders et al. (2016), an investigation is classified as value-free or value-laden, depending on the researcher's involvement. On the other hand, if the researcher's values influence the research and the method to approach the research objective and the ontology of the research happens to be subjective, it is classed as value-laden research. Having outlined this research philosophy, the researcher now examines and explains the various philosophical positions and, specifically, the philosophical position for this study in the

following sections. Researchers have their particular inclinations regarding their philosophical positions.

3.3.2.2 Positivism

The positivist epistemological view can be defined as the application of methods of natural sciences to the study of social phenomenon (Knight & Ruddock, 2008). The researcher is concerned with observing a social phenomenon and generate quantifiable data with the aim of generalising the results in the form of a scientific law-like cause and effect (Saunders & Tosey, 2012). The positivist researcher has no personal influence (*value-free*) on the data, and it is only obtained from the observation of the phenomenon in a structured manner (Saunders et al., 2009; Saunders & Tosey, 2012). They further state that the researcher uses quantitative methods for data collection that can be statistically analysed. Saunders et al. (2009) suggest that social science researchers can use some aspects of the positivism, such as testing hypothesis. Positivist research uses existing theory to develop a hypothesis and uses observations to gather data for testing the hypothesis to justify or refute the theory.

3.3.2.3 Interpretivism

The researcher is concerned with the study of a social phenomenon through research amongst people with the intention of understanding the social phenomenon from their position and perception (Creswell, 2009; Saunders et al., 2009; Saunders & Tosey, 2012). The interpretivist research has to become immersed in the process by adopting an empathetic stance (Saunders et al., 2009). Saunders & Tosey (2012) further elaborates that the interpretivist research is influenced by the values of the researcher and individuals involved as well. And it involves qualitative data collection from small samples.

3.3.2.4 Critical Realism

The emergence of critical realism (CR) is from the idea of realising a satisfactory realist paradigm of illustrative critique and social sciences (Bhaskar, 2013), many disputes arose from the criticism that humans do experience the feelings and descriptions of the real world (Novikov and Novikov; 2013). According to critical realism, the feelings and descriptions of the real world can be misleading, and

they usually do not portray the real world. Contrary to empirical realism (positivism) and transcendental idealism (constructivism), critical realism discusses the need for ontology (what is knowledge) (Miller and Tsang, 2011). Bhaskar (2013) debated critical realism as a social and natural science, which is reinforced by an ontology of natural necessity, which works in both ways at all times. The researcher defines natural necessity as a necessity in nature entirely free of human beings and their activity (Bhaskar, 2013, pp.10). The quest for ontology is an effort to understand and express the nature of reality.

It establishes that a thing exists independent of our knowledge and understanding of those things (Sayer, 2010, p.5). Critical realist appreciates the significance of multi-level study hence increase the value of influence and interrelationship between individuals, groups, and organisation (Archer et al., 2013). Critical realism presumes that ontology is changing, structured and differentiated. This likewise involves a change from events to the mechanism that produces events, that is the products of the events, not the events themselves (Haji-Abdi, 2014). The role of mechanism, events and experiences can be described in CR realm as real, the actual and the empirical ontologies. The real specialises in the identification of the fundamental mechanism that produces the experienced events which generate the causes and effect of that experience (Bhaskar, 2013).

3.3.3 Pragmatism

Pragmatism is concerned with the practical consequences of the research, and it suggests that there is no single point of view that can fully portray the situation (Saunders & Tosey, 2012). Moreover, Saunders et al. (2009) state that pragmatism enables researchers to adopt any of the philosophical stances from Ontology, Epistemology and Axiology as according to their own interest and understanding for research. Thus, granting the researcher freedom of thought to focus on the research question without engaging in the philosophical classification debate. Pragmatism allows the researcher to use any type of methods, such as qualitative or quantitative techniques. Saunders & Tosey (2012) also argue that the pragmatist research does not require a number of different data collection techniques but stress the importance of research design and use of the adequate technique for data collection.

3.3.4 Philosophical Position for this Research

Fellow and Lui (2015) are of the view that a researcher needs to state his/her ontological and epistemological position and inclination. However, Saunders et al. (2007) argued that the research philosophy varies depending on the research questions and objectives. In line with this, this research's ontological philosophical position used in exploring the experience and knowledge of PPP practitioners in Ghana is objectivism, while the epistemological assumption is largely positivist. Nevertheless, there was an aspect that required an interpretative stance. This research also adopted a combination of quantitative and qualitative (mixed method) strategies as the research methodology. Therefore, the research uses both subjectivist and objectivist epistemologies. The researcher was not part of the study response used for this study and did not influence any aspect of the study; therefore, the axiological position is value-free. The adopted philosophical position for this study is summarised in Table 3.1.

Table 3-1: Summary of the philosophical stance for the study

Positivism	**Research Philosophy**	**Interpretivism**
Objectivism/ idealism	Ontology	Constructivism/ realism
Positivism	Epistemology	Subjectivity
Value-free	Axiology	Value-laden
Quantitative	Methodology	Qualitative

Source: Adapted from Saunders et al. *(*2016) and Akoti (2014)

3.4 Research Approach

The critical decision that a researcher must make is the adoption of the correct reasoning approach, as it will serve as the foundation for developing the research strategy. As stated by Saunders et al. (2009), a researcher is required to appreciate the research approach, which is most suitable to address her/her research questions. In discussing theory generation, many research approaches can be

adopted. Nonetheless, the researcher is of the view that it is useful to indicate the diverse route for approaching research reasoning. Generally accepted research approaches are deductive, inductive, and abductive (Saunders et al. 2009; Ahmed 2016). These approaches are briefly discussed below.

3.4.1 Deductive

The deductive approach tends to be more inclined towards the positivist researcher. Saunders et al. (2016) indicate that it starts from the researcher's formulation of a hypothesis based on existing theory and collection of data for analysis to test the hypothesis to confirm the application of theory. If there is a need, the researcher can modify the hypothesis and repeat the process. In other words, the theory is used to resolve an issue and generalize the results.

3.4.2 Inductive

The inductive approach, on the other hand, starts with the generation of a new theory or the modification of an existing one, which will eventually be tested through additional data collection. There should be an initial gathering of data to explore the phenomenon, identify it, and explain the identified patterns (Saunders et al. 2016). This allows the researcher to contextualise knowledge and events. The inductive researcher gathers data from a relatively smaller sample for analysis and develops a theory to solve the problem. This allows the researcher to interpret the data and be creative in developing a new theory.

3.4.3 Abductive

As suggested by Saunders et al. (2009), it is not compulsory for the research to strictly follow either of the aforementioned research approaches (i.e., inductive and deductive). Instead, both approaches can be used by the researcher in the same study depending on the research objective and question. Dawood and Underwood (2010) called this approach the bridging approach. They further explained that it is an approach that is concerned with the discovery of new facts and the creation of new knowledge by the researcher through bridging the gap between deductive and inductive reasoning. Svennevig (2001) felt that the inductive and deductive approaches are inadequate on their own. Further, Svennevig (2001) stated that there is slightly less certainty about the results with this

approach, but it is more productive compared to the inductive and deductive approaches in isolation. However, from a theoretical point of view, the flexibility of using both inductive and deductive logic should enable the researcher to solve the problem more efficiently. Saunders et al. (2016) summarised the research approach, as detailed in Table 3.2.

Table 3- 2: Deduction, induction and abduction: from reason to research

	Deduction	**Induction**	**Abduction**
Logic	In deductive inference, when the premises are correct, the conclusion must also be true	In inductive inference, known premises are used to generate untested findings	In abductive reasoning, known assumptions are used to create testable outcomes
Generalizability	Generalising from the general to the specific	Inferring from the particular to the general	Inferring from the interactions between the specific and general
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Data collection is used to study the phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection, and so forth.
Theory	Theory falsification or verification	Theory generation and building	The production or modification; incorporating existing theory where appropriate, to build a new theory or modify the existing theory.

3.5 Research Approach Adopted for this Study

The choice of an appropriate research approach for this research was dependent on the pragmatic philosophical stance, which was premised on the research question. The researcher adopted the abductive approach, as it is a logical process to apply to the research and links both the inductive and deductive reasoning strategies to solve the research problem, as mentioned by Creswell (2009). As discussed earlier, the abductive approach allows the researcher the flexibility to use both inductive and deductive approaches according to the needs of the study. The abductive approach to the research allows the use of multiple research strategies and methods for finding a logical and practical solution to the problem. This idea of multiple strategies has been discussed by Saunders et al. (2012) and Fellows and Lui (2015), they stated that the approach has advantages over a single strategy and is

becoming more popular. After careful consideration of the research aim and objectives and of the research questions, the use of a "multiple methods" research methodology was adopted, and it helped in the further selection of appropriate research strategies for data collection and techniques for data analysis.

3.6 Research Methodological Choice

As indicated in Figure 3.2, the third layer of the “research onion” is a “research methodological choice”. The methodological research choice is the first step of the research design (Goyal 2018). Though guided by the philosophical underpinnings adopted by the researcher, it is a practical way of converting research questions into a project. As shown in Figure 3.2, this step focuses on the choices of the researcher to adopt either a quantitative, qualitative, or mixed-methods research design.

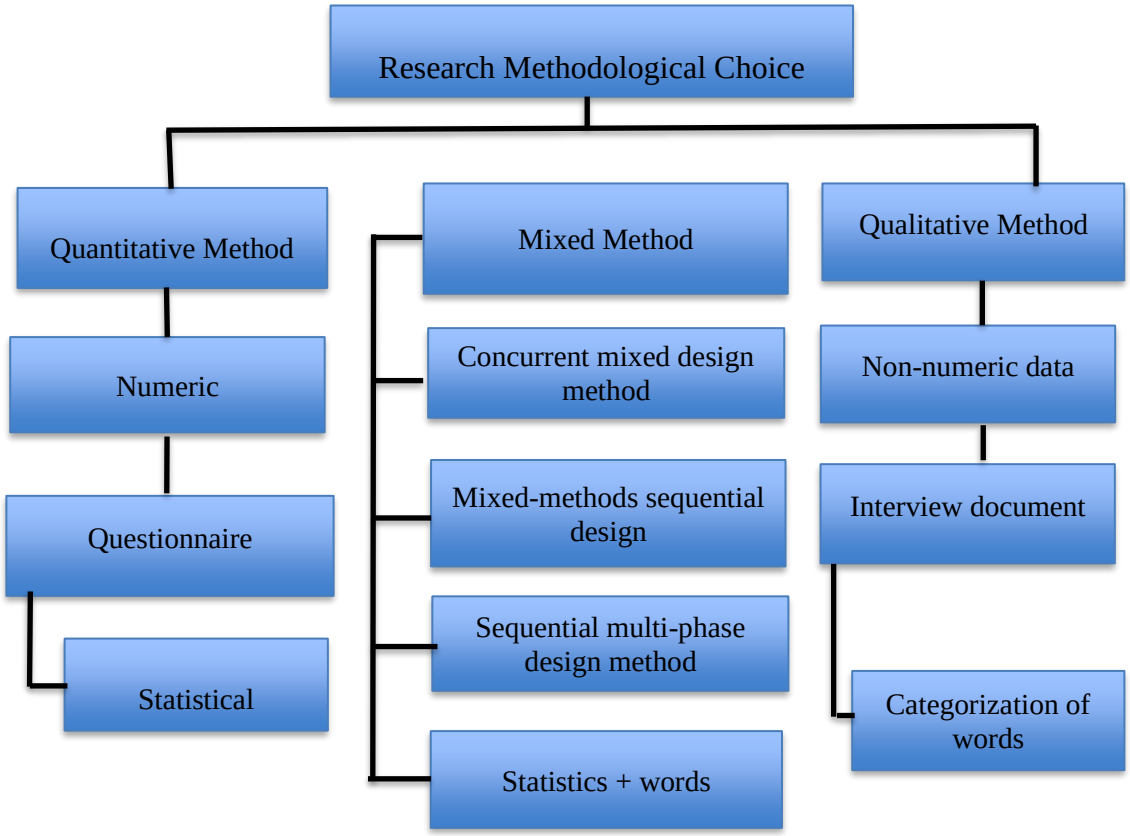


Figure 3- 2: Research Methodological Choice,

Adopted and modified from Goyal (2018; Saunders et al. 2016)

3.6.1 Qualitative Research Method

The process of investigating occurrences from the participants' viewpoint is considered as qualitative research. Fellows and Liu (2015), are of the view that the qualitative research approach seeks to gain an understanding of how groups or individuals view the world. The qualitative research method has been considered as the most efficient means of discovering phenomena (Saunders et al. 2016). The qualitative approach is divers from the quantitative research approach, which depends solely on quantity or data analysis procedure based on graphs and statistics. The qualitative research, however, uses reasonable inductions to decode data (Akoti 2014). As pointed out by Fellows and Liu (2015), the most important advantages that link with the use of qualitative research approach is the ability to produce more thorough clarifications of human phenomena as well as in-depth analyses of complex human and cultural dynamics. Saunders et al. (2012), collaborated with this approach in a context that the depth of data and thoughtful a researcher gains from the exploration of such experiences from participants in their natural settings are enormous.

3.6.2 Quantitative Research Method

The questionnaire survey strategy is a quantitative method used to collect data such as trends, attitudes, and opinions of a population. Administered questionnaires are used for data collection from a relatively large sample and are analysed using statistical techniques, and it helps in answering questions such as who, what, where, how much and how many. Some of the most significant benefits of using a questionnaire survey are, 1) it is easy to disseminate; 2) it is less expensive, and 3) it has a broader outreach. The survey questionnaires can be administered to target respondents through the post, via email, online, or in social media forums. Although they are easy to disseminate and collect, survey questionnaires have a significant drawback in that the questions are usually not very detailed or complicated, they use a fixed response, there is a low response rate, and they cannot be used to obtain a detailed response to open-ended questions (Saunders et al. 2012). However, the responses can be statistically analysed using computer programs.

3.6.3 Mixed Methods

Compared to other research strategies, the mixed-methods strategy provides the researcher with the flexibility to effectively combine the vigour of both types of research strategy, that is, the qualitative and quantitative, for data collection and analysis in the same research (Creswell 2009; Saunders et al. 2009). As pointed out by Saunders et al. (2016), the mixed-methods strategy offers the researcher the opportunity to triangulate the data sources, which helps in eradicating biases and in portraying a clearer picture of the events, trends, and phenomena. Creswell (2009) and Saunders et al. (2016) outlined a major benefit of the mixed-methods approach as being the opportunity for the researcher to develop in-depth knowledge of the phenomenon, and a greater ability to generalise the research findings. According to Saunders et al. (2016), one of the features of the mixed-methods approach is that the techniques from both quantitative and qualitative methods can be fused in a variety of ways, ranging from simple, concurrent forms to more complex and sequential methods. The various types are explained briefly below, and the strengths and weaknesses of the mixed-methods design are also presented in Table 3.4.

3.7.3.1 Concurrent Mixed Design Method

This method comprises data gathering and analysis through separate quantitative and qualitative strategies within a single-phase research design. According to Saunders et al. (2016), this method offers more detailed data than the mono-method design. It is shorter in timescale, as well as more practical to understand than the sequential mixed methods design. Also, it allows both sets of results to be interpreted together.

3.7.3.2 Sequential Exploratory Design (Chosen Methodological)

Unlike the concurrent mixed-methods design, this method comprises of more than one stage of data collection and analysis. Regarding this research method, the researcher follows the use of one method with another to expatiate on the initial set of findings (Saunders et al. 2016). This research design leads to either a sequential explanatory research design (quantitative followed by qualitative) or sequential research design (qualitative followed by quantitative). This design method was considered appropriate for this research because, through this method, a semi-structured interview was used to

collect valuable information from PPP expert in Ghana which led to the formulation of the questionnaire surveys (quantitative).

3.7.3.3 Sequential Multi-Phase Design Method

Saunders et al. (2016) opined that the sequential multi-phase design method involves multiple phases of data collection and analysis (e.g., qualitative followed by quantitative and then by another phase of qualitative). The use of double-phase or multiphase strategies is a dynamic approach to the research process, which acknowledges the fact that mixed-methods research is both interactive and iterative where one phase guides the research to the next phase of data collection and analysis.

Table 3- 3: Strengths and weaknesses of the mixed-methods approach

Strength	Weaknesses
Words, images, and descriptions can be used to supplement the meaning of figures and vice versa.	Can be more expensive to conduct.
Stronger evidence can be provided through convergence and corroboration of findings.	Mixing two or more research paradigms can be difficult and problematic.
Can provide a range of research questions and issues with a broader perspective.	Can be time-consuming
The insights and understanding are more profound than with the single approach method.	Analysis and drawing of inferences to interpret findings can be complex.
Can offer provide all the knowledge required to inform both theory and practice?	Can generate a large volume of information/data.

Source: Adapted from Johnson and Onwuegbuzie (2004)

3.7 Research Strategies

A research strategy has been defined in many ways; however, in an academic investigation, a strategy is a planned route adopted by the researcher to address the aims and objectives of the research. The choice of strategy depends upon the nature of the research question, research aim, research objectives, existing knowledge, time available, and the philosophical stance of the research (Saunders et al.

2009). The three main research strategies commonly used are qualitative, quantitative, and mixed methods. Some of the prominent research strategies that could have been adopted by the researcher for this study are the experiment, survey, case study, action research, grounded theory, archival research, and mixed methods (Creswell 2009; Dawood & Underwood 2010; Saunders et al. 2016). These strategies are discussed below to develop an understanding of the strategies and justify the adoption of the appropriate strategy for this research.

3.7.1 Experiment

Experimentation is generally associated with the natural sciences; it follows strict procedures and is independent of the researcher's values. An example can be that of a scientist working in a laboratory, according to Saunders et al. (2009). Experiments involve studying the causal links between the variables and the extent of their influence on each other. This strategy is suitable for exploratory and explanatory researches for answering "how" and "why" questions (Saunders et al. 2009). Moreover, Creswell (2009) stated that experiments are carried out in a controlled contextual environment that enables the researcher to focus on the effect of the treatment on the phenomenon/ subject only. He further stated that experimentation research is quantitative.

3.7.2 Survey

A survey is one of the most popular research strategies in social sciences for exploratory and descriptive studies. It is a quantitative method and can be used to collect data such as the trends, attitudes, and opinions of a population (Saunders et al. 2009; Creswell 2009). Generally, administered questionnaires are used for a survey among a relatively large sample, and the data are then analysed using statistical techniques according to Saunders et al. (2009), who further suggested that the survey strategy can help in answering the questions such as who, what, where, how much and how many. As mentioned earlier, it is generally preferred because of its ease of dissemination, low cost, and wider outreach.

3.7.3 Action Research

Action research seeks the improvement and modification of a phenomenon through actively engaging all the stakeholders in the research process (Knight & Ruddock (2008). Saunders et al. (2009) stated that the action researcher works collaboratively with the practitioners and professionals to investigate the situation, to identify the problem, to take action, and to develop a solution. The research process does not stop there, but the research team evaluate the new situation and again go into the iteration cycle. This process is repeated until the required results are achieved. Action research is a time- and resource-intensive strategy.

3.7.4 Grounded Theory

The grounded theory aims for the development and construction of a theory based on a finite set of pre-collected data from observations (Knight & Ruddock 2008; Saunders et al. 2009). Saunders et al. (2009) stated that it is particularly helpful for research in predicting and explaining a certain behaviour. The research begins from the data, and the data are constantly used as a reference point throughout the process to test the theory; Saunders et al. (2009) classed it as an inductive/ deductive approach. Creswell (2009) further stated that the researcher has to constantly compare the developing theory against the data to keep both of them synchronised.

3.7.5 Ethnography

It is an inductive research approach, proceeding from anthropology, which is concerned with the study of the social world according to the perception of the social actors, and it requires the researcher to become one of the social actors as well (Saunders et al. 2009). They further mentioned that it is a very time-consuming strategy and needs to be very flexible to respond to the constantly evolving thoughts and knowledge of the researcher.

3.7.6 Archival Research

Archival research on, the other hand, is the assessment and can be defined as the “locating, evaluating, and interpreting information found in the archive in an organised(Louise 2004,). The research can be of an exploratory, descriptive, or explanatory nature. It is concerned with the study

of changes in a phenomenon over the period of time based on the analysis of archived administrative records and documentation that include both the recent and historical records (Saunders et al. 2009).

3.8 Time Horizon

Time horizon is about the duration a researcher plans to achieve a research objective or in other words to complete a research. Saunders et al. (2016) describe a time horizon as a particular time (snapshot) research is undertaken or a series of events over a period of time. These he classifies as cross-sectional and longitudinal, respectively. A cross-sectional study aims to identify and understand the interaction within factors under a study at a given point in time, unlike the longitudinal study, which attempts to establish trends over some time. Due to time constraints, this study adopts the cross-sectional time horizon over some time. To achieve this, the literature on factors preventing the private sector from investing in PPP and best practice from a global perspective was used to provide a better perspective of the phenomenon under study. The next section discusses the unit of analysis.

3.9 Unit of Analysis

Every research aims at studying a variable, subject or an entity referred to as the unit of analysis. The unit of analysis represents a major subject under study, which could be an individual, group of individuals, an organization or even behaviour as stated by Collis and Hussey (2013). Research may focus on a case that is clearly defined, such as an individual or not very clear such as decision making. However, Remenyi et al. (1998) suggested that defining the unit of analysis can be achieved by considering the research questions given that the study has a clear focus and limitations. Accordingly, Yin (2014) stated that it is essential to define what lies within the case topic and the context of a study. In this study, the unit that was observed is the 'private sector investors' in a PPP road project, and the unit can be classified under "organization." The unit of observation is also the same as the unit of analysis in this study. While the unit of analysis (the private sector investors) identified in this research, appearances to be under the "individual" category, however, the researcher is of the view that it falls under "organization " category since it is an organization that forms the SPV and also signs a contract with the public sector. This justifies the unit of analysis that is being studied.

3.10 Research Objectives and Methods Adopted for Data Collection

Having discussed the various research strategies and methodological choice, this section again brings the research objectives to view and proffer the steps adopted for data collection. The instruments used for data collection, the sampling techniques used, the sampling of participants and respondents are discussed under this section.

Table 3- 4: Research objectives and their relevant data collection techniques

Objectives		Method		
		Literature Review	**Interview**	**Survey**
1	Critically examine the existing knowledge on public-private partnerships (PPPs) to gain an understanding of PPPs, infrastructure financing, PPP project vehicles and drivers, and the success or failure of PPP projects.	✓	✓	×
2	Investigate the challenges preventing the private sector from investing in PPP road projects in Ghana	✓	✓	✓
3	Explore the global best practices that can address the challenges identified from the study, and	✓	✓	×
4	Develop and validate a best practice framework that can address the challenges identified from the study.	✓	×	✓

3.11 Research Techniques and Procedures

According to Saunders et al. (2016), collection and analysis of data are critical for research. Therefore, this section explains the major sources of data, the different qualitative and quantitative data collection techniques, and their appropriate procedures of analysis.

3.11.1 Sources of Data

Data are the information every research requires to answer its research questions and achieve its objectives. As cited by Saunders et al. (2016), data can be collected from primary or secondary sources. Primary data are data collected first hand by the researcher, from an individual or a group of people (Goyol 2018). Primary data are most often collected through the use of a pre-determined instrument, such as a survey questionnaire or interviews. In contrast, secondary data are information previously collected for other purposes and made available to the public through documents and

publications. Though some researchers (Creswell 2014; Knight & Ruddock 2009; Saunders et al. 2016; Yin 2014) have suggested different data collection methods, they all have similar characteristics and generally come under primary or secondary data sources. The most common sub-sources of data are discussed in the next section

3.11.2 Data Collection Techniques

Having discussed the two major sources of data, this section goes further to discuss the various techniques for data collection commonly used by researchers. Yin (2014) explained that in a case study, data could be collected from multiple sources of evidence to draw a set of conclusions about the phenomenon under study. Yin identified six commonly used sources of evidence, namely, documentation, archival records, interviews, direct observations, participant observations, and physical artefacts. Documentation or documents are in various forms, such as reports, letters, articles and others. They provide sufficient background for the study and specific information about the phenomenon under study and are found to be relevant in case of studies, as they are strong corroborative tools to other sources of evidence (Proverbs & Gameson 2009). Archival records include records from public services or organisational records, which are mostly quantitative. They also can provide information about a specific issue, but a major challenge is that accessing such records can be difficult.

Interviews are an effective way of collecting a large number of samples, particularly within case study research. Prolonged, short, and survey case study interviews are the types of interview identified by Yin (2014). Weaknesses of bias may occur within this source of evidence, but when this evidence is used in combination with other forms of evidence, this weakness can be overcome. Direct and participant observations are techniques that offer the researcher a real understanding of the phenomenon under study; however, it can be costly and time-consuming. Physical or cultural artefacts are tools, devices, or works of art commonly used in anthropological research as observations within specific research. Yin (2014) stated that this source of evidence has less potential relevance in a case study. Having explained the strengths and weaknesses of each source of evidence, it was concluded that archival records, observations, and physical artefacts are not suitable for this research; hence

documents, interviews, and surveys were adopted. These techniques are discussed in detail in the following sections.

3.11.3 Instruments of Data Collection

3.11.3.1 Documents

Review of documents is essential within a case study to corroborate and supplement findings from other sources (Yin, 2014). They can be used to verify information from other sources, such as interviews, and can provide powerful clues for further research. However, Yin observed that some evidence from documents might contradict instead of corroborating findings and suggested that in such a case, further enquiry is required.

3.11.3.2 Interviews

According to Proverbs and Gameson (2009), an interview is an essential aspect of research where rapport and a relationship are built between the interviewer and the interviewee that might be beneficial in the future. Saunders et al. (2016) stated that the research interview is a verbal conversation between two or more people to collect information for research purposes. Based on the structure, Saunders (2016) categorised these into structured, semi-structured, and unstructured interviews. Yin referred to the same three structures but referred to unstructured interviews as open-ended interviews. The unstructured or open-ended interview requires free responses in relation to the broad topic under study. Semi-structured interviews are conducted from predetermined questions but allow room for pre-modification in the course of the interview. Structured interviews are conducted based strictly on predetermined questions following a pattern.

Gillham (2005) categorised interviews into two groups based on proximity: face-to-face and distance interviews, which are also referred to as pen-and-paper interviews (PAPI) and computer-assisted personal interviews (CAPI) (Newman et al. 2002). Face-to-face interviews involve the interviewer meeting the respondents, which can be one or a group of respondents. This method allows the researcher to access more information, mainly when observations are involved. However, it can be time consuming and expensive.

On the other hand, distance interviews involve a process whereby the researcher gains information from the respondent without meeting him/her. They include telephone or screening interviews and emails. Though it is time and cost-efficient, Saunders et al. (2016) stated that the potential disadvantage of this form of interview is that personal contact and rapport will not be established. Also, it can be potentially disrupted by poor internet connectivity.

3.11.3.3 Survey (Questionnaire)

In a survey, questionnaires are usually used for data collection; these comprise a set of questions with a choice of answers, which are then used as the data in the research. Questionnaires are quantitative and commonly used for descriptive and statistical inferences in a case study survey (Knight & Ruddock 2009). According to Hoxley (2009), questionnaires can be administered by post, face-to-face interviews, email, over the phone, or via the internet. Hoxley further suggested that careful thought should be given to the design of the research and the research instrument, as using the questionnaire to collect data and subsequent analysis can be straightforward but can also be complicated if the questionnaire and the research are not carefully designed. There are generally two types of questionnaire design: open-ended questions and closed-ended questions. Open-ended questions, as the name implies, give the respondent no options to choose from; thus, the respondent is not restricted to specific options but is allowed to provide his/her answer freely. A disadvantage of open-ended questions is the possibility of receiving a response outside the context of the research.

On the other hand, the use of closed-ended questions means the respondent chooses freely from options already defined by the researcher. Although Pallant (2013) stated that closed-ended questions could make data coding and analysis easier for the researcher, however, the weakness of this design is that vital information can be missed, as possible options that respondents might have selected can be omitted in the course of the questionnaire design. Pallant further suggested that open-ended questions are useful to capture such omissions because the respondents are able to express their opinions about the subject in question freely and are not restricted to the options of the researcher. Closed-ended questions, however, are measured on nominal, ordinal, interval or ratio scales. Nominal scales measure variables; they are either names or variables which at most times are mutually exclusive. An ordinal scale goes further than the nominal scale to provide information in order of

preferred choice. An interval scale also gives a ranking to the options and allows the respondent to quantify the differences between the options. A ratio scale provides more detailed information on the order, the interval between options, and absolute values. Nominal scales usually are mutually exclusive and do not overlap, for example, (a) male and female, or (b) yes, no, and not sure. In the ordinal scale, values are arranged in order of importance. A typical example of an ordinal scale is the Likert scale. Gray (2013) suggested that the Likert scale is a relevant scale to measure variables and indicators, such as the attitudes, opinions, and behaviour of participants during data collection. It is usually designed as predetermined statements to categorise responses on scales of importance, frequency, and so on.

The values usually assigned in the Likert scale are summarised in Table 3.5. Aside from those summarised in Table 3.5, other scales range from 3 to 10 scaled values. A typical Likert scale question has the scale equally divided with the neutral value at the middle. For instance, 1= strongly disagree 2=disagree, 3= neutral, 4= agree, and 5=strongly agree. The Likert type scale can have values from 1 to 5; however, the scale does not have to be divided equally. The scale is designed in such a way that response either in affirmation or otherwise is received for each question. Sometimes, no room is allowed for a neutral or no opinion, which is likely to affect the response rates of the questions. These are often referred to as balanced and unbalanced scales, respectively. An interval scale provides order in variables and equal differences between the values. Current research in social sciences permits treating an ordinal scale as an interval scale, providing the research defines the differences between the values (Gray & Kinnear 2012; Ryan & Garland 1999). A ratio scale allows for a wide range of statistical techniques because it provides the order of the values and the difference between values, and it recognises the place of an absolute zero.

Table 3- 5: Value designation for Likert scale

Value	1	2	3	4	5
Agreement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Significance	Very insignificant	Significant	No opinion	Significant	Very significant
Importance	Unimportant	Of little importance	Moderately important	Important	Very important
Condition	Poor	Fair	Good	Very good	Excellent
Impact	No impact	Low impact	Medium impact	High impact	Extreme impact
Occurrence	Never	Rarely	Sometimes	Often	Always
Significance	Insignificant	Of little significance	Moderately significant	Significant	Very significant

3.12 Qualitative Research Methodology

According to Saunders et al. (2012), a qualitative research approach is true to the life research approach. The approach is mainly explanatory in nature as it gives some required details, incentives, and views. Again, it brings a better perspective into a problematic situation as it helps philosophies or theories for potential quantitative research and also helps to established on a better view of the reality of the subject under study (Saunders et al. 2012). Qualitative research adopts a subjective, approach; therefore, words are mostly the results of the findings instead of numbers, as would be the case in quantitative research. The methods of data collection are sometimes, in contrast, using structured, unstructured, or semi-structured techniques. The most frequently used methods used include individual interviews, focus groups, and participation/observations (Denzin and Lincoln, 2011). Respondents are carefully selected to fulfil a given quota from the small sample size designated.

In this study, the perspectives of the research participants became paramount and later gave clear indications of how the various types of challenges affect the implementation of PPP road projects in Ghana leading to the lack of private sector investment in road development in the country. The reason for adopting the qualitative approach to this research was to validate and contextualise the global PPP challenges preventing the private sector from investing in PPP projects as identified from the literature review. Throughout the literature review, it was observed that PPPs are project- and country-specific.

Therefore, the experts' opinion on the global factors helped put this research into a proper perspective and also helped in the formulation of appropriate questions for the quantitative data collection. In this study, the data from the semi-structured interviews were initially analysed to identify the factors preventing the private sector from investing in PPP road projects; the results from the interviews helped with the design of the questionnaire. This process thus validates the sequential exploratory approach method that was adopted for this study.

3.12.1 Data collection Techniques Adopted (Qualitative)

As discussed in section 3.15, facilitation technique, as suggested by Saunders et al. (2012) was used for this research. Interviews and a survey questionnaire were used for data generation. The qualitative studies were based on semi-structured interviews with participants who had knowledge and experience of PPPs with five or more years of experience in Ghana. The identities of the respondents remain anonymous for ethical reasons. The actors were directors, project managers, contract managers, and procurement experts. The participants' information is detailed in Table 3.6

Table 3- 6: Participants' Profile.

Sector	Position	General Experience	Years of Experience in PPP
Public	Director	26	7
	Assistant Director	10	6
	Procurement Expert	13	6
	Contracts Manager	15	7
	Principal Engineer	12	6
Private	Project Manager	10	8
	Technical Adviser	15	8
	Chief Executive officer	22	6
	Team Leader	15	6
	Investment Banker	11	7

3.12.2 Sampling and Selection of Interview Participants/ Respondents

The semi-structured interviews were conducted with 10 PPP experts in Ghana to ascertain their views on the factors identified from the literature review. The interview participants included directors, contract managers, civil engineers, and project managers. Because PPP practice in Ghana is not

mature, the participants were selected through a combination of purposive and snowball non-probability sampling methods. The adoption of this method was in line with Saunders et al. (2016). They mentioned that most current research projects find the adoption of a combination of sampling techniques suitable to achieve a set of targets. Trochim (2002) described snowball sampling as a process whereby the identification of subjects for inclusion is by referral from other participants. As pointed out, a purposive sampling technique was adopted, which consisted of identifying professionals involved in PPP projects or that had significant knowledge about PPPs. Purposive sampling is beneficial, for instance, where the researcher needs to contact a targeted sample quickly after which, other participants were recruited through the first participants' recommendations.

Deciding on the number of interviews to be conducted in a study can be critical. Guests et al. (2006) provided evidence from previous studies that the saturation of information is a significant indicator for a researcher to decide when sufficient interviews have been conducted. Guests et al. suggested that after 12 interviews, saturation is usually achieved. Contrary to the view of Guests et al. (2006), Yin (2014) opined that there is no fixed number of interviews for qualitative research; instead, what is essential is that the researcher finds the number of interviews that would help in achieving the research objective. Saunders et al. (2015) instead suggested a sample size of between 10 and 25 interviews for qualitative research depending on the research objectives. In line with Saunders's suggestion, this study conducted ten (10) semi-structured interviews with key participants who provided information relevant to the issues under study. Though this number does not restrict the researcher, the researcher in this study took the view that these ten interviews from the context of this research achieved fulfilment in terms of data gathering, as saturation of information was attained.

3.12.3 Semi-Structured Interviews

Having considered the characteristics of all the interview methods of collecting data, a semi-structured interview method was adopted for this study. As pointed out by Saunders et al. (2015), semi-structured interviews are the most suitable, as complex and open-ended questions can be used to explore new insights. The use of closed-ended or structured questions is found to limit the depth of information emerging during the course of an interview. In contrast, semi-structured interviews are found to be flexible, and information not captured in the initial design of the schedule is accepted

during the course of the interview. With the semi-structured interview approach, the researcher was able to begin the face-to-face discussion with a predetermined question, based on the challenges identified from the literature review (see section 2.20); this gave the interviewee an opportunity to shed more light on the issues or to disagree. Hence the adoption of semi-structured interviews was the most suitable for this research. The outcome of the interview inquiry also provided a complementary technique used in developing a questionnaire (see Appendix F).

3.12.4 Interview Design and Process

The participant information sheet was issued to the participants after they had been identified through the purposive and snowballing sampling approaches. They were taken through the participant information sheet for them to appreciate the research objective and the context of the study, after which the participant consent forms were issued for them to give their consent. An appropriate date and place for the interviews were agreed with each of the participants. Follow-up telephone calls were also made to each of the participants to confirm the date and time for the interview. A sample of the participant information sheet and consent form are attached as Appendices B and C, respectively. The semi-structured interviews were conducted in the participants' offices and were recorded using a hand-held voice recorder and were then transcribed into Microsoft Word. Notes were also taken, as the researcher combined recording the interview with notetaking, partly as a safety measure in case of equipment failure. The notetaking also helped the researcher to focus on the participant's responses and to develop further questions, explore issues more profoundly, and seek clarification on relevant issues. A list of the questions that served as a guide and which was derived from the literature review was used to direct the interview process to ensure that the key areas relating to the factors that prevent the private sector from investing in PPP road projects in Ghana were well covered.

3.12.5 Coding System and Grouping

The data from the semi-structured interview was coded. The essential components were used for organising the information from the coding technique employed in this study. Besides, the commentaries from the respondents, the three essential components used were code/keywords, discussion/respondents, and themes/measures. The identification of the course of action was to

classified as codes/keywords, and the discussion marks indicated the respondent's discussion from which the idea came, while themes/measures mark out the reactions of the experts. The respondents are denoted with capital letter 'P'; internals, which is primary source materials were created using the NVivo (see Figure 4.1). Themes were created from the sub-themes, and all themes and sub-themes generated from the analysis were used to develop the questionnaire for the study as shown in Figure 4.4

3.12.6 Validity of the Response - Qualitative

The most significant step towards ensuring the validity of a qualitative study is the use of pilot studies for the interview (see section 3.14.1). Additionally, before the commencement of the data analysis, checks were conducted on all the interviews; the transcribed data were sent to the participants for verification and confirmation to ensure that the transcribed data reflected the opinions expressed by each of the participants during the face-to-face interviews. This shows the validity of the exercise after the respondents unanimously approved the corrected original question inquired in the interview. According to Snowling et al. (2011), question validity is significant with regard to the validity of the research. The coding validity was the second validation step that engaged with the interview data.

3.13 Data Analysis

The analysis of qualitative data is sophisticated and is based on the text/ words instead of the numbers, and the researcher plays a critical role in interpreting the meaning and context of the text (Saunders et al., 2012). They have further mentioned that the analysis process of qualitative data generated from interviews involves transcription, coding, categorisation, summarising and condensing to make sense of the data. Content analysis is one of the most used methods of qualitative analysis.

The thematic content analysis is focused on the identification of the existence of specific terms in relation with particular concepts/ themes within the text, and it has been defined as a qualitative research method involving identification, analysis and reporting of themes within the data (Braun & Clarke, 2006). As already mentioned, there are two types of thematic analyses '*Deductive*' and '*Inductive*'. In deductive method are the researcher is informed by the existing theory, literature,

experience or due to a personal interest in the topic to an extent and has developed a concept for categories data according to the pre-determined themes. On the other hand, the inductive thematic analysis relies solely on the data, and the researcher has to read it to make sense and identify themes without pre-deciding the themes to be found. But it has been suggested that there is a third approach as well that allows the researcher to pre-define some categories and add more categories upon the emergence of new themes (Kulatunga et al., 2007). Therefore, as pragmatist research, it was in-line with the philosophical position of this research to utilize thematic content analysis for analyzing the Semi-Structured interviews.

3.14 Quantitative Research Methodology

According to Qian et al. (2005), quantitative research can either be experimental or descriptive. A descriptive study. The descriptive study comprises of means, standard deviations, and a variety of scores for the variables (Creswell 2013). The gathering of information for quantitative research is done through structured data collection methods such as mobile surveys, online surveys, kiosk surveys, and paper surveys. For this study, a self-administered questionnaire and the postal method were used. The data from survey responses were analysed and used in arriving at the results such as frequency count and percentages involving tables, bar charts, pie charts, and line graphs. The Quantitative data analyses are a valuable instrument used for exploring relationships of variables that cannot be directly measured (complex), such as physiological scales, socioeconomic status, and nutritional pattern (Rahn 2013). In order to develop a best practice framework for PPP implementation in the roads sector of Ghana, the responses of the questionnaire were subjected to a rigorous statistical analysis.

3.14.1 Pilot Study

A pilot study is a small-scale preliminary investigation usually conducted before the primary investigation in order to filter questions and clarify wordings as well as to test the design. In this research, after designing the instruments of primary data collection, a pilot study was conducted with five (5) PPP practitioners who had knowledge in PPP. Feedback and suggestions from the pilot study respondents led to the modifications and improvement of the questionnaire items. Consequently, the

questionnaire's content, structure, clarity, and readability were improved. The revised version of the questionnaire was sent out after it had been refined and finalised by the researcher's supervisor (Naoum 2013). Table 3.7 indicates the respondents who took part in the pilot study.

Table 3- 7: Profile of Pilot Survey Participants

Position	**Sector**
Contracts Manager	Public
Procurement Expert	Private
Procurement Expert	Private
Director - PPP	Public
Assistant Director -Procurement	Public

3.14.2 Sampling and Questionnaire Distribution

Once the questionnaire had been designed and piloted as the instrument for quantitative data collection, the sample size was then determined. Marshall (1996) asserted that deciding on the sample size for quantitative data to be collected is paramount after the instrument for data collection has been designed. Saunders et al. (2015) recommended the use of questionnaires in combination with other methods of data collection, though this is not to imply that it cannot be used as the only data collection method. In order to fulfil the conditions for adopting a mixed-methods research approach, the questionnaire was administered to collect quantitative data for this research. The primary motivation for every researcher conducting research is to draw enough data to conduct a meaningful analysis so that conclusions can be drawn (May 2011). Given this, a sampling technique has been considered the

most suitable means through which such estimation and such information can be obtained in a manner that enables the researcher to address the requirements of their research objectives. Sampling techniques is the criteria usually used to estimate, identified and a reasonable number of respondents within a targeted population for any research (Bryman, 2001). In other words, it is the technique that involves the identification and selection of "units of the target population which are to be included" in a study (Sarandakos 1998, pg 139).

According to Sarantakos (2013) and May (2011), two types of sampling techniques available are probability or random and non-probability sampling. Sarantakos (2013; 1998) felt that probability sampling techniques are useful where the reliability and generalisation of findings are required. Quantitative studies, in most cases, use the probability form, which includes simple random, systematic, stratified, and cluster types (Saunders et al. 2016). On the other hand, non-probability sampling techniques, according to May (2011), are primarily adopted in circumstances where there are no well-defined sampling frames, and yet the researcher already knows the general features of the population. This approach is inclined to favour a qualitative research methodology, which most qualitative researchers adopt because of its flexibility in nature. The primary forms of non-probability sampling techniques are accidental, purposive, quota, snowball sampling (Sarantakos 1998; Black 1999), and haphazard and volunteer sampling (Saunders et al. 2016). Before a decision is taken on which type of sampling techniques were preferable for the studies, the various types of sampling techniques that are most frequently used are discussed below.

3.14.2.1 Purposive Sampling

Purposive sampling is sometimes referred to as judgmental, selective, or subjective sampling. It tends to select the most productive part of the population to achieve the objective of the study within a limited resource frame. As described by Meissner (2012), the process involves participants being recruited in a study based on their knowledge or experience in a field of the researcher's interest. Silverman (2015) described it as a non-probability sampling technique that is selected when it displays features of interest to the researcher.

3.14.2.2 Snowballing

Snowballing, also known as chain referral sampling, is a method where participants or informants initially identified for a study are asked to recruit potential participants by referring the researcher to them (Robinson 2014). This is done continuously until the desired sample size is obtained or when the researcher reaches a saturation point: a point when no new themes or information is gained from the interviews but merely a repetition of what has already been covered. Snowballing was adopted at the interview stage for key

3.14.2.3 Stratified-Random and Questionnaire Distribution

Stringfield, and Teddlie (2003) and Saunders et al. (2016) described the selection as a sampling technique that identifies the most extreme case or outliers in order to show an accurate representation of the situation at hand. Stratified random sampling is a sampling technique where prior knowledge about the population is used to systematically select sub-populations, which can then be used as samples for a survey.

Table 3- 8: Types of sampling techniques

Types of sampling	**Non-probability**	**Probability**
Sampling method adopted	Purposive snowball	Stratified-random stage
Data collection method	Semi-structured interviews	Survey questionnaire

Table 3.8 presents the type of sampling techniques commonly used. In the case of this study, a **s**tratified random sample method was used in administering the closed-ended questionnaires to staff from the public and the private sector of construction organisations in Ghana on a 5-point Likert scale ("1" representing "strongly disagree" and "5" "strongly agree"). As pointed out by Saunders et al. (2016), quantitative studies, in most cases, use the probability form, which includes simple random, systematic, stratified, and cluster types. In all, in the first week of May 2018, a total of two hundred and fifty (250) questionnaires were delivered to the selected respondents, who had knowledge of and experience in PPPs in Ghana. Follow-up telephone calls were made to remind them of the submitted date (which was 31 July 2018). This was done to emphasise further the importance of completing the

questionnaire on time and to increase the response rate (Saunders et al. 2015). As shown in Table 3.9, 250 questionnaires were distributed through email, postal and self-administered, 110 of the questionnaires were received in May 2008, while an additional 40 were received in June 3018, and finally, 43 were received one month after the deadline for submission; thus, a total of 194 responses were received, representing 77.6% (n=194) out of the total selected sample of 250. An example of the questionnaire is attached as Appendix F.

The questionnaire responses were collated with the aid of Microsoft Excel (2016); the responses were grouped together and examined to check how the respondents had answered the questions and to check evidence of bias to ensure the questionnaires had been fully completed (Saunders 2016; Opoku 2012). As presented in Table 3.9, an analysis of the questionnaire indicates that 168 questionnaires were fully completed and subject to further analysis, representing a 67.2% response rate. However, 26% of the questionnaires were rejected because they had not been fully completed, and therefore, they were not included in the SPSS analysis. The 67.2 % response rate was considered excellent for further analysis, given that the concept of PPP in the Ghana construction industry was new (Zou et al. 2014).

A letter was attached to the questionnaire to provide background information about the researcher, it also outlined the main objectives of the research, provided the reason why the respondents' assistance was being sought, and lastly, assured issues relating to the confidentiality of the respondents (Saunders et al. 2015). The questionnaires were administered by hand and post and were collected through the same means. A copy of the cover letter is also shown in Appendix E.

Table 3- 9: Questionnaire responses of public and private sector respondents

Item	**Private Sector**		**Public Sector**		**Total Response**	
	Number	**%**	**Number**	**%**	**Total number**	**Total %**
Questionnaires distributed	100		150		250	
Completed questionnaires returned	82	82.00	112	74.67	194	77.60
Fully completed questionnaires	72	72.00	96	64	168	67.20
Questionnaires not completed	10	12.20	16	14	26	26.48

3.15 Facilitation

As pointed out by Toriola-Coker (2018), facilitation is described as the use of one method of data collection or research approach to support research using another method of data collection or research approach within a study. Saunders et al. (2016) are also of the view that a quantitative or qualitative approach can be used equal or non-equally, so that one method has a dominant role, while the other play a supporting role depending on the research purpose. Whiles triangulation, on the other hand, is using a data collection method or paradigm to aid the research of another within one study in order to ensure that you are getting positive response from the data (Saunders et al. 2012). In this study, semi-structured interviews data gathering approach was used to support the quantitative (survey questionnaire) research approach, which is the primary research approach. This was done in order to be assured of and to improve the credibility and reliability of the findings in this study.

3.16 Data Analysis Tools and Process

As previously mentioned, the questionnaire design was used to obtain information from the respondents. Figure 3.3 describes the processes adopted for the quantitative data analysis for this research. The data collected were first computed in Microsoft Excel 2010, and proofreading was done to correct any possible errors. Excel was also used to plot the radar chart for descriptive statistics. After that, the data were exported to SPSS version 23 (Statistical Package for the Social Sciences) and subjected to statistical testing.

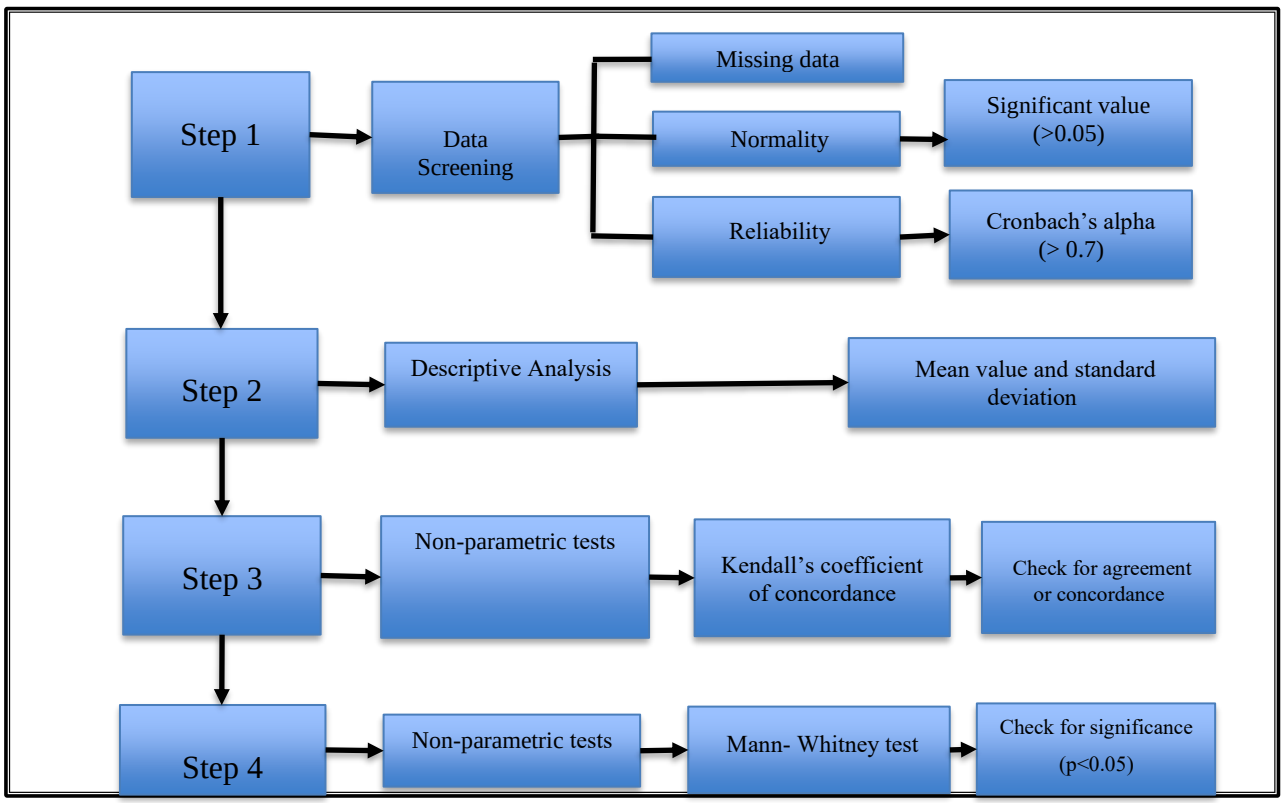


Figure 3- 3: Process of quantitative data analysis

Source: Adopted and modified from Jayasuriya (2017)

3.16.1 Step 1-Data Screening

As indicated in Figure 3.3, after all the survey questionnaire responses had been received, the first step was to manually enter the data into a Microsoft Excel spreadsheet for the data to be screened. In order not to distort the statistical analysis, values which were outside the value for a variable were corrected; the frequencies for each of the variables were checked and errors corrected before total scores for these scales were calculated. Out of the 194 questionnaires that were received, 168 were considered complete after the screening. The completed questionnaires were, therefore subjected to further analysis.

3.16.1.1 Checking Normality Distribution

According to Pallant (2016), normality is used to describe an asymmetrical bell-shaped curve (fails to correspond to one another in shape and size), which has the highest frequency of scores in the

middle with smaller frequencies towards the extremes. As cited by Pallant (2016), many of the statistical techniques assume that the distribution of scores on the dependent variable is normal. Based on that principle, Pallent, further suggested that normality check should be carried out as the first step. In view of this, a normality assessment was carried out on the responses received from the survey using SPSS Microsoft software. Two methods commonly used to test for normality are graphical and numerical. An example of the graphical presentation of a histogram for one of the factors is presented in Figure 3.4

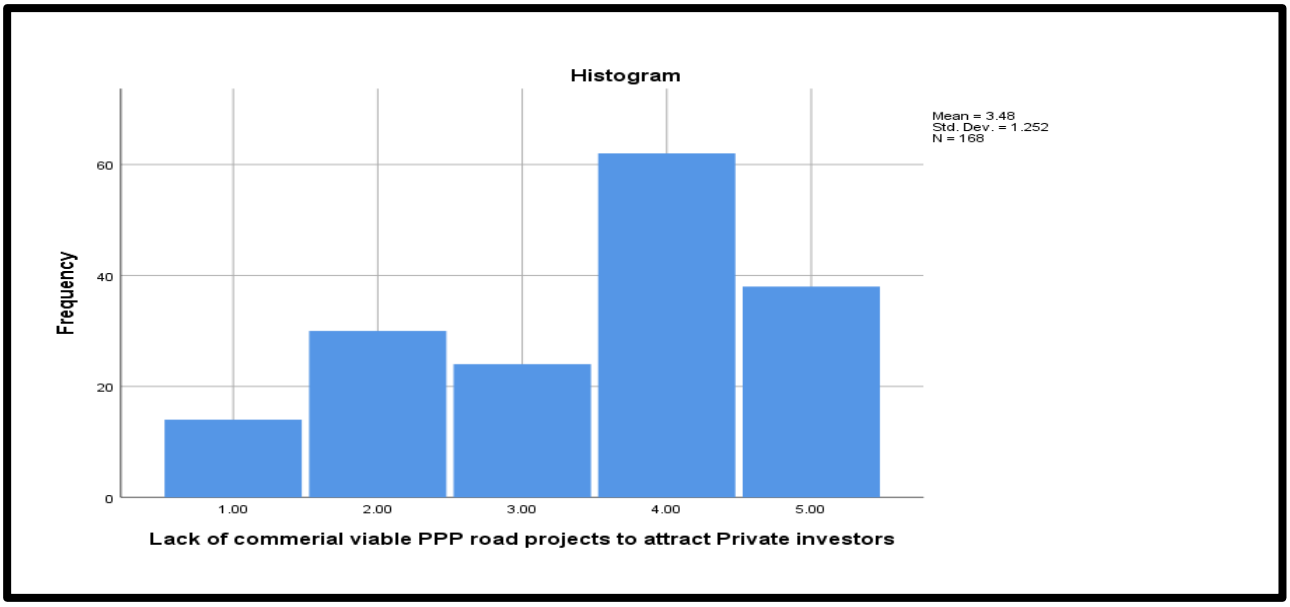


Figure 3- 4: Graphical presentation of the normality test result

As mentioned by Akotia (2014), for quantitatively related research, two statistical tests that are usually conducted are parametric and non-parametric. These tests mostly depend on the type and nature of the data collected. Pallant (2016), is of the view that non-parametric techniques are perfect for use when you have data that are measured on nominal (categorical) and ordinal (rank) scales. Besides, Pallant, indicated that they are also useful when dealing with very small samples and when dealing with data which do not meet the stringent assumptions of parametric techniques. Parametric tests, on the other hand, make assumptions about the population from which the data are taken (Fellow and Liu 2008). On like the non-parametric techniques, parametric techniques depend on interval-scaled data and assume that data collected are a normal distribution.

In the case of this study, however, the Kolmogorov-Smirnov and Shapiro-Wilk normality tests (Table 3.10.) conducted on the data indicated significant (sig) values of .000, which are less than .05. As mentioned by Pallant (2016), a significant value (Kolmogorov-Smirnov and Shapiro-Wilk normality tests) less than .05 suggests a "violation of the assumption of normality." It was based on this reasoning that a non-parametric test was considered more appropriate for this study.

Table 3- 10: Normality test

Factors	**Kolmogorov-Smirnov[a]**			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Local banks' inability to provide long-term loans for PPP	0.269	168	0	0.763	168	0
Lack of commercially viable PPP road projects to attract private investors	0.257	168	0	0.874	168	0
Private investors not able to recoup their investment within the concession period	0.279	168	0	0.855	168	0
Unrealistic road toll charges	0.215	168	0	0.894	168	0
a**. Lilliefors Significance Correction**						

3.16.1.2 Validity and Reliability of the Questionnaire

The validity of a scale is the degree that measures what it is supposed to measure. Validation of a scale involves the collection of empirical evidence concerning its use (Pallant 2016). The three types of validation test, commonly used are content validity, criterion validity and construct validity (Sekaran & Bougie 2016). As pointed out by Sekaran and Bougie (2016), reliability, on the other hand, measure the extent to which a data is without bias.

Additionally, reliability checks are conducted for the consistency of the measures. For this study, content validity was achieved because the questionnaire was developed based on the literature. Also,

a pilot survey (see section 3.14.1) was conducted on the draft questionnaire by PPP experts in Ghana. The pilot study helped in ensuring that the questions were explicit and appropriate to address the research objectives.

To determine whether the questionnaire survey instrument use measured what it was supposed to measure a Cronbach's Alpha test was conducted. The reliability test conducted on the questionnaire survey (Table 3.11) indicates a Cronbach's Alpha value of 0.747; the value suggests that the questionnaire has good internal consistency reliability. Attaining Cronbach's Alpha coefficient above 0.7 is generally considered to be acceptable, and values above 0.743 are a very good level of internal consistency (Pallant 2010). Therefore, the value of 0.743 obtained implies that the questionnaire is consistent and reliable.

Table 3- 11: Reliability test result

Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**No of Items**
0.737	0.743	18

3.16.2 Step 2-Descriptive Analysis Method

Once the researcher was sure there were no errors, a descriptive analysis was carried using a computer (SPSS) software. Descriptive statistics is the easiest way to present quantitative data in a manner that gives and general overview and graphical presentation of the findings (Pallant, 2016). Descriptive statistics include central tendencies, such as means, medians, and modes, and measures of dispersion, such as the standard deviation mean. Useful information on the participants' demographic was collected in sections 1 and 4 of the questionnaires. The demographic profiles of the participants helped to understand the characteristics of the participants and their background and the sector of their organisation. In section 4.5.2, the means and standard deviations of the variables were calculated, and mean ranking was used to rank the variables in each section. As described by Cheung et al. (2012) and Cheung (2009), the mean score is the average of the responses, and the standard deviation is a

measure of variation from the mean. Hence, if two or more variables occurred to have the same mean, the one with the lower standard deviation was considered more important.

3.16.2.1 Mean Score Ranking Technique

Many researchers with similar normality situations have used the mean scoring ranking technique. For example, Cheung et al. (2012), Cheung (2009), Osei-Kyei and Chan (2017d), Osei-Kyei and Chan (2017c), and Chan and Kumaraswamy (1996) adopted the "mean score technique" for non-parametric data for similar research. Therefore, the data collected from the current questionnaire survey were also analysed using the same technique, within various groups being categorised according to the origins of the respondents (i.e., public and private sector). The 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) was used to calculate the mean score for each factor, which was then used to determine its relative ranking.

3.16.3 Step 3-Statistical Analysis

After the data had been cleaned and sorted in SPSS, the next stage was deciding which statistical analysis to run. However, the nature of the data determines the statistical technique employed for data analysis. Various types of statistical analysis could have been adopted for this study. As Akoti (2014) stated, there is a wide range of statistical tests; however, the type of statistical tool to be used largely depends on the type of available data. Considering that the researcher was dealing with non-parametric data, two statistical tests which have been widely used by PPP researchers for a similar study in recent times were considered (Kendall's coefficient of concordance and the Mann-Whitney U-test). For instance, Osei-Kyei and Chan (2017), Esther (2009); Osei-Kyei et al. (2019), and Damoah and Akwei (2017) used Kendall's coefficient of concordance analysis to examine the level of agreement among two groups and used the Mann–Whitney U-test to determine whether there were any statistically significant differences in the perception of the different groups. It was for this reason that among the list of non-parametric statistical tests available, Kendall's coefficient of concordance and Mann-Whitney U-test were adopted, as these were considered more appropriate for this study. The non-parametric test tool was considered appropriate because of the unequal sample sizes of the

two independent groups (Osei-Kyei and Chan 2017c). Table 3.12 provides information about the suggested statistical analyses based on the scale of the data.

Table 3- 12: A suggested analysis based on the scale of data

Type of analysis	**Non-parametric**	**Parametric test**
a). Based on the scale of data		
Central tendency	Median or mode	Mean
Variability	Frequencies	Standard deviation
Differences	Chi-square	T-test, regression
Relationship	Kendall tau B or C	Pearson's r
Tests for comparing two or more groups	Wilcoxon rank-sum test	Paired t-test
	Mann-Whitney U test	Unpaired t-test
	Spearman correlation	Pearson correlation
	Kruskal-Wallis test	One-way Analysis of Variance (ANOVA)

Source: Field (2013) and Pallant (2016)

3.16.3.1 Kendall's of Concordance (Non-Parametric Test)

The survey respondents in this study were stratified (the private sector and the public sector. Therefore, Kendall's concordance analysis was conducted to measure the agreement of different respondents on their rankings of factors based on mean values within a particular group (Osei-Kyei and Chan 2017; Cheung et al. 2012). According to Cheung (2009), if Kendall's coefficient of concordance (W) is vital at a prefixed permissible significance level of, for example, 0.05, a reasonable degree of consensus amongst the respondents within the group on the rankings of factors is indicated.

As mentioned by Siegel and Castellan (1988) and cited in Cheung (2009) and Osei-Kyei and Chan, (2017), the "W" value is suitable only when the number of attributes is less than or equal to 7. If the number of attributes is greater than 7, Chi-square is used as a near approximation instead. In the case of this study, the number of attributes was not more than 7. Therefore, the "W" values were preferred.

3.16.3.2 Mann-Whitney U Test (Non-Parametric test)

The Mann-Whitney U test is data analysis carried out using an SPSS 20.0. Given that the researcher was dealing with non-parametric statistics, the first analysis used deals mainly with the ranking of the PPP strategies based on their mean values. This was followed by a Mann-Whitney U test (P) test to determine whether there were any statistically significant differences in the perception of different groups on the challenges that prevent the private sector from investing in PPP road projects (using null and alternative hypotheses). The p-value is used to decide whether the null hypothesis can be rejected. In this regard, the null hypothesis is essentially a hypothetical claim that there is no difference between the groups concerning the 18 factors rated by the respondents. If the p-value is less than "alpha", which is set at 0.05, then the null hypothesis can be rejected, and there is a significant difference for the specific factor. Two research hypotheses were formulated and tested for this study. The aim is to establish differences in the perception of participants on the issues under discussion. This then shapes the formulation of appropriate PPP strategies in the study area. The hypotheses are as follows:

1) Null Hypothesis (Ho): There is no significant difference in the perception of the public and the private sector respondents; and
2) Alternative Hypothesis (HI): There is a significant difference in the perception of the public and the private sector respondents.

The Mann-Whitney U test was undertaken to compare the groups of cases and identify differences, as this test can examine the level of agreement between stakeholders with the rating of the significance of the issues to determine whether the mean significance of each issue is equal between the groups (Zhang 2006). If the value of U exceeds its critical value at some significance level (usually 0.05), it means there is evidence to reject the null hypothesis. However, Pallant (2016) recommended that the effect size of the difference should also be considered. Accordingly, the effect size can be calculated using the following.

Equation 3.1. $$\frac{2}{\sqrt{n}}$$

Where " Z" is the standardised test statistic and "n" is the total number of participants. According to Cohen (1977), if the effect size is greater than 0.5, there is a large effect; if it is 0.3, there is a medium effect, and if it is 0.1, there is a small effect. Therefore, both the above criteria were used. In the present study, the Mann-Whitney U test was used to explore the differences in public and private sector views on the factors that are preventing the private sector from investing in PPP road projects. At the end of the Mann-Whitney U test analysis, factors with a p-value less than "alpha", which was set at 0.05, and less than the effect of size value of more than 0.5 were removed from the list of factors.

3.17 Evaluation of the Data for Validation of the Framework

Validation is essential, as it is concerned about ensuring the correct procedures have been followed (Lucko and Rojas 2010), and it measures the usability, adequacy, or precision of a system to ensure improvement in the credibility of the outcomes or performance of the system (Carson 2002). In order to validate the best practice framework developed from this research study, the proposed best practice framework was presented to experts in Ghana for validation. There were three main criteria which were considered for selecting the survey respondents for this validation process. Firstly, the respondents needed to have more than five years' experience in/knowledge of PPP. Secondly, the respondents needed to have a good amount of knowledge on road projects in Ghana. Lastly, the survey respondents must not have contributed to the development of the best practice framework in this research study. A total of nine responses were collected; the details of the respondents are shown in Table 6.6.

3.18 Ethical Considerations

This research was guided by the University of Salford code of practice for research. All of the participants were provided with the necessary details about the research, and their involvement and consent to participate were obtained. The collected data were secure and confidential, and the participants' anonymity was maintained throughout the study and beyond. Moreover, the participation in this research was entirely voluntary, and the participants were given the right to withdraw from the research at any stage along with their data without providing any reason. The researcher had obtained ethical approval from the University of Salford after satisfying all the ethical requirements to proceed

with empirical data collection and recruit participants for the survey and interviews. The ethical approval letter can be seen in Appendix-A.

3.19 Chapter Summary

This chapter has discussed the overall research design and justified the research methodology adopted through the various stages of research philosophy, approaches, methodological choice, strategies, and techniques utilised for the research. The selected methodological research design has also been justified in this chapter. The pragmatic philosophical approach adopted enabled the convergence of qualitative and quantitative methods to explore the challenges preventing the private sector from investing in PPP road projects in Ghana from dual perspectives in the context of the roads sector of Ghana. The multiple sources of data filled the gaps in data sources and provided the research with useful insights from which to draw conclusions. The statistical method used in the analysis of the data was thoroughly discussed in this chapter, that is, Kendall's coefficients of concordance and the Mann-Whitney U test. After the discussion of the research methodology, the next chapter presents qualitative and quantitative data analysis.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1 Chapter Introduction

The preceding chapter (Chapter Three) discussed the methodological choice for this research and presented details of the research process and reasoning for the adopted philosophical positions for this research. This chapter introduces and makes sense of the empirical findings of the qualitative and quantitative investigation from semi-structured interviews and the survey questionnaire, respectively. It also ensures that the research aims and objectives (see section 1.7) is attained. This chapter considers qualitative and quantitative data analysis. Therefore, this chapter is subdivided into two parts (sections 4.2 and 4.5).

Firstly, the analysis of the qualitative data collected through semi-structured interviews is discussed. The section begins with the aim of the semi-structured interviews, analysis of the interview data, participants' background, and the findings from the semi-structured interviews.

Secondly, the quantitative data analysis and the interpretation from the empirical questionnaire survey were carried out. The 250 questionnaires were self-administered, email, and postal. A total of 168 completed and useable responses (representing a response rate of 67%) were received and analysed. The questionnaire survey data were analysed using a combination of descriptive statistics; mean ranking values, frequencies, standard deviation and statistical analysis using Kendall's coefficient of concordance (W) and Mann-Whitney U test (P) analysis. These analytical methods were considered suitable. Appendix F contains the questionnaire used to collect the data for the investigation. The chapter also concludes by linking the data collected with the research objectives as well as providing ontological explanations from objectivism perspective for PPPs, as discussed in section 3.3. Finally, the general summary of the entire chapter and the implications for the study is provided.

4.2 QUALITATIVE DATA ANALYSIS

4.2.1 Aim of the Semi-Structured Interview

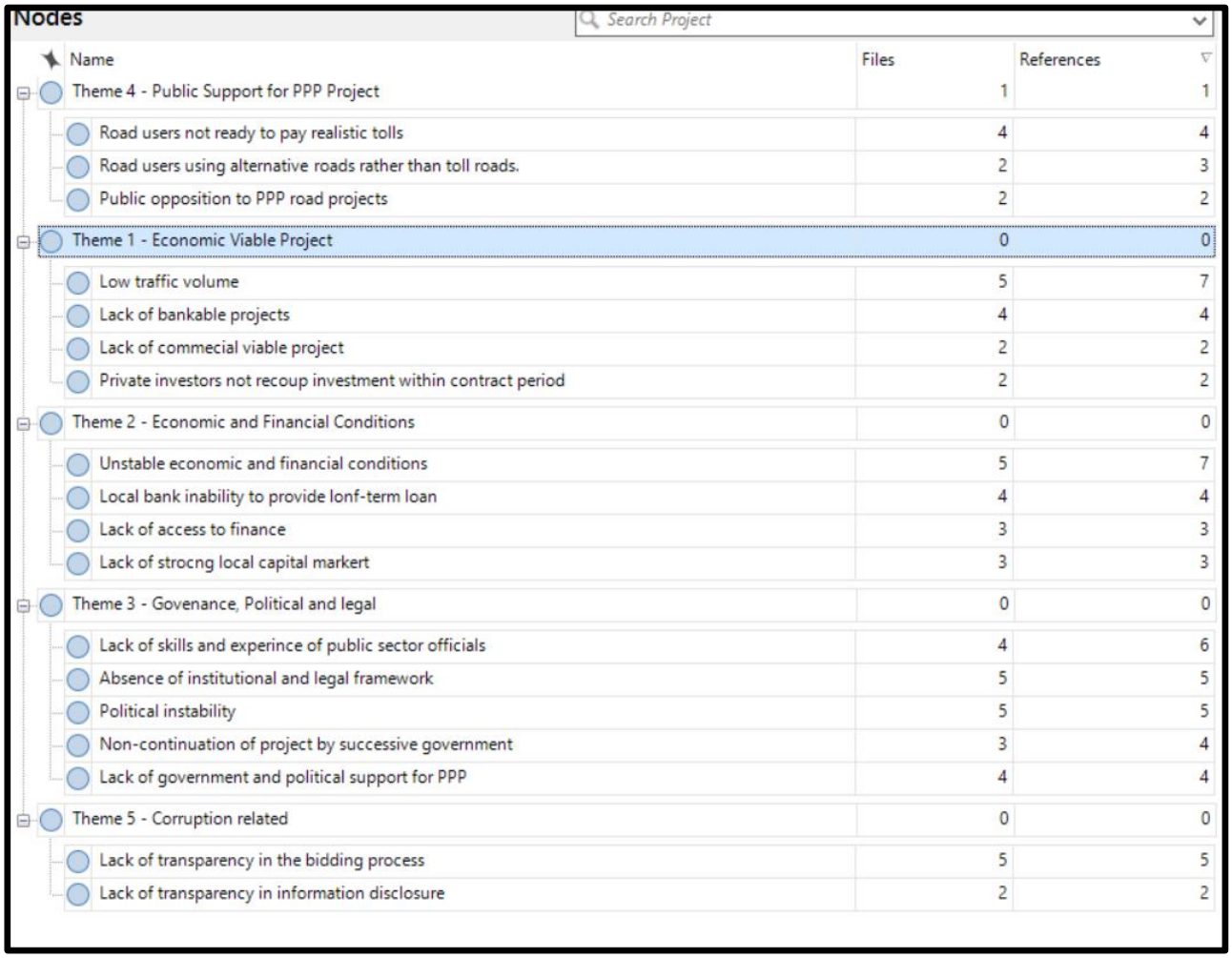
The use of the qualitative approach for this study has been discussed and justified (see section 3.12). The qualitative method was employed to demonstrate that people could have a different perspective on a phenomenon, which could result in multiple realities due to the diversity in experience and understanding (Atkinson 2014; Sauder et al. 2016). In line with this reasoning, this study utilised semi-structured interviews for the qualitative data collection. From the literature review, it was observed that PPPs are country and project-specific. Thus, validating the global factors that prevent the private sector from investing in PPP projects from the Ghanaian perspective required inputs from experts in Ghana who were either involved in or had knowledge of PPPs. It is for this reason that semi-structured interviews were used to explore new ideas and directions and to contextualise the global factors identified from the literature in the Ghanaian roads sector context. The adopted strategy helped to achieve the following research objective partially:

- Investigate the challenges preventing the private sector from investing in PPP road projects from the Ghanaian perspective (research objective No. 2). Also, the outcome from the semi-structured interview helped in formulating the research questionnaire for the quantitative aspect of the data collection.

4.3.1 Interview Data Analysis

As previously discussed, (see section 3.12), thematic analysis was used to analyse the quantitative data. In order to categorise and organise the qualitative data collected, NVivo (2011) software tool was used. Before beginning with the data analysis, checks were conducted on all the interviews; the transcribed data were sent to the participants for verification and confirmation to ensure that the transcribed data reflected the opinions expressed by each of the participants during the face-to-face interviews. After this stage, the patterns in the data were determined, and conclusions drawn based on the data. Figures 4.1 and 4.2 present screenshot showing themes, file source and references and screenshot indicating the free-flowing text of coded information in NVivo (version 11) for thematic coding in this research, respectively. Information provided from the NVivo (2011) has been

summarized in Table 4.1, to provide clarity and to show the themes and sub-themes, number of sources and number of references. The themes and sub-themes that emerged from the interviews are further discussed in the subsequent subsections.



Name	Files	References
Theme 4 - Public Support for PPP Project	1	1
Road users not ready to pay realistic tolls	4	4
Road users using alternative roads rather than toll roads.	2	3
Public opposition to PPP road projects	2	2
Theme 1 - Economic Viable Project	0	0
Low traffic volume	5	7
Lack of bankable projects	4	4
Lack of commecial viable project	2	2
Private investors not recoup investment within contract period	2	2
Theme 2 - Economic and Financial Conditions	0	0
Unstable economic and financial conditions	5	7
Local bank inability to provide lonf-term loan	4	4
Lack of access to finance	3	3
Lack of strocng local capital markert	3	3
Theme 3 - Govenance, Political and legal	0	0
Lack of skills and experince of public sector officials	4	6
Absence of institutional and legal framework	5	5
Political instability	5	5
Non-continuation of project by successive government	3	4
Lack of government and political support for PPP	4	4
Theme 5 - Corruption related	0	0
Lack of transparency in the bidding process	5	5
Lack of transparency in information disclosure	2	2

Figure 4- 1: Screenshot showing themes, file source and references

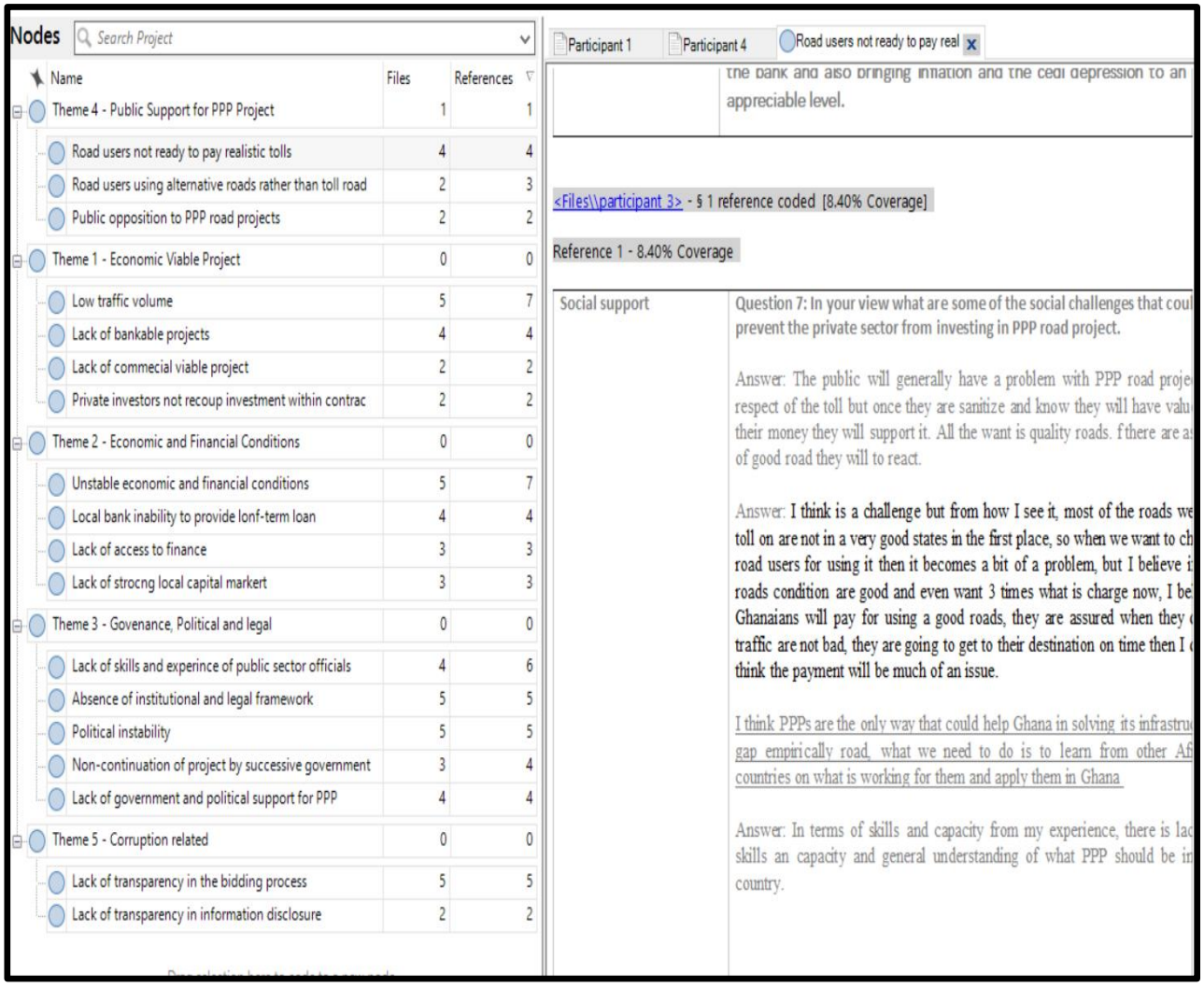


Figure 4- 2: Screenshot showing the free-flowing text of coded information in NVivo (version 11)

Table 4-1: Summary of information from NVivo analysis

Main node – Theme 1	**No of Sources**	**No of References**
Economically viable project		
Child node		
Lack of bankable projects	4	4
Low traffic volumes	5	7
Lack of commercially viable PPP road projects to attract private investors	2	2
Private investors not able to recoup their investment within the concession period	2	2
Main node – Theme 2		
Economic and financial conditions		
Child node		
Local Banks inability to provide long term loans for PPP	4	4
Lack of access to finance for PPP project	3	3
Lack of strong local capital for PPP	3	3
Unstable economic and financial conditions	5	7
Main node – Theme 3		
Policy and political factors		
Child node		
Lack of suitable skills and experience of PPP professionals	4	6
Absence of clear institutional and PPP legal framework	5	5
Political instability	5	6
Non-continuation of uncompleted PPP road projects by successive government	3	4
Lack of government support for PPP road projects	4	4
Main node – Theme 4		
Public support for PPP road projects		
Child node		
Public opposition to the PPP road projects	2	2
Road users not ready to pay realistic tolls	4	4
Road users using alternative roads rather than the toll roads	2	3
Main node – Theme 5		
Corruption related factors		
Child node		
Lack of transparency in the bidding process	5	5
Lack of transparency in information disclosure	2	2

4.3.1.1 Participants' Background

Given the multidisciplinary of stakeholders involved in PPP implementation (Bult-Spiering and Dewulf 2008), the interviews were stratified (see section 3.14.2.3) into two groups (public and private sector actors). As cited in the research methodology chapter (see section 3.12.2), ten (10) semi-structured interviews were conducted with experts who were involved in devising the Ghana PPP policy and with those who were currently working on or had been working on PPP projects in Ghana with five or more years of experience in PPPs. From the Ghanaian perspective, the experts provided in-depth information on the challenges that might be preventing the private sector from investing in PPP road projects in Ghana. The interview participants were labelled P1, P2 … P10, in accordance with ethical considerations of the use of anonymous quotations. Table 4.2 presents a summary of the participants for the semi-structured interviewee's background, management position, years of experience, and codes.

Table 4- 2: Interview participants' profile.

Sector	Position	General Experience	Years of Experience in PPP	Participants Code	Total n=10
Public	Director	26	7	P1	n=5 (50%)
	Assistant Director	10	6	P2	
	Procurement Expert	13	6	P3	
	Contracts Manager	15	7	P4	
	Principal Engineer	12	6	P5	
Private	Project Manager	10	8	P6	n=5 (50%)
	Technical Adviser	15	8	P7	
	Chief Executive officer	22	6	P8	
	Team Leader	15	6	P9	
	Investment Banker	11	7	P10	

As shown in Table 4.2, the participants were from a diverse professional background with different job titles, including Director, Assistant Director, Contracts Manager, and others. Their overall experiences ranged from 10 to 26 years, while specific PPP knowledge or experience was between 6 and 8 years. In total, 50% (n=5) of the interview participants worked in the public sector, and the

other 50% worked in the private sector. Having discussed the aim and objectives of this chapter and provided the background of the participants, the succeeding sections present the findings from the semi-structured interview data analysis from the NVivo (2011) software.

4.3.1.2 Findings from the Interviews

After codes had been generated for the interview participants, the qualitative data were derived from the transcribed information stored in the NVivo (2011), in a systematic way by asking questions relating to the research objectives and in line with the challenges identified from the literature review. The responses from the interviewees were classified under the themes that emerged from the interview with the corresponding sub-themes; the main themes, sub-themes and the percentage of the respondent's responses are presented in Table 4.3. The themes and their sub-themes are discussed in the subsequent section.

Table 4- 3: Themes and sub-themes from the semi-structured interview.

Themes	Sub-themes/Factors	Number of responses		Total Number (N=10)	
		Public Sector	Private sector	Total of responses	Percentages of response
Economically viable PPP projects	Lack of bankable projects	4	2	6	60%
	Low traffic volumes	1	2	3	30%
	Lack of commercially viable PPP road projects to attract private investors	1	1	2	20%
	Private investors not able to recoup their investment within the concession period	3	2	5	50%
Economic and financial conditions	Local banks' inability to provide long term loans for PPP	3	3	6	60%
	Lack of access to finance for PPP projects	2	3	3	50%
	Lack of strong local capital for PPP	0	1	1	10%
	Unstable economic and financial conditions	4	3	7	70%
Policy and political factors	Lack of suitable skills and experience of public sector professionals in PPP	2	3	5	50%
	Absence of clear institutional and PPP legal framework	1	1	2	20%
	Political instability	1	3	4	40%
	Non-continuation of uncompleted PPP road projects by successive governments	3	1	4	40%
	Lack of government support for PPP road projects	1	2	3	30%
Lack of public support for PPP road projects	Public opposition to PPP road projects	2	1	3	30%
	Road users not ready to pay realistic tolls	2	3	4	50%
	Road users using alternative roads rather than toll roads.	1	2	3	30%
Corruption-related factors	Lack of transparency in the bidding process	3	4	7	70%
	Lack of transparency in information disclosure	1	1	2	20%

4.3.1.2.1 Economically Viable PPP Projects – Theme 1

Evidence from the literature suggested that a lack of "economically viable PPP projects" can prevent the private sector from investing in PPP road projects. Accordingly, respondents' views were sought during face-to-face interviews to obtain a Ghanaian perspective on the issue. From Table 4.2, four (4) challenges emerged under this theme from the interview data analysis:

1) lack of bankable projects;
2) low traffic volumes;
3) lack of commercially viable PPP road projects to attract private investors; and
4) private investors not able to recoup their investment within the concession period.

As detailed in Table 4.2, 60% (n=6) of the respondents were of the view that "lack of bankable projects" can prevent the private sector from investing in PPP road projects, 30% (n=3) cited "Low traffic volume" as a significant issue for PPP road projects in Ghana, 20% = (n=2) of the respondents mentioned, "lack of commercially viable PPP road projects to attract private investors" and 50% (n=5) were of the view that "private investors not able to recoup their investment within the concession" was an issue that could prevent the private sector from investing in PPP road projects in Ghana. Some of the views expressed by the respondents (public and private) under each of the sub-theme are presented below:

Lack of Bankable PPP Projects

Views from public sector participant (P01):

> *I think a bankable project is all that private investors are looking for because having a bankable project means the project can attract loans based on the project cash flow…we have worked on a few reports, and the prospect is good.*
>
> *Nevertheless, as we speak, I think the only bankable project for mow is the Accra-Tema Motorway, so I can confidently say that bankable project is a challenge within the Ghana roads sector. One key thing, in respect of a bankable project, is cash flow, which in many toll projects is from traffic volume and toll charges, but the traffic volume on most of our roads is*

very low. I think the toll charges we pay in Ghana too need to be reviewed upwards, but the question is, do our politicians have the political will to do that. It is not an easy thing!

Low Traffic Volumes

Views from public sector participant (P02):

As I have already indicated, the traffic volumes are not motivating enough to attract private investors. For now, the only project we have which seems commercially viable is the Accra to Tema Motorway Project. The viability of the PPP road infrastructure projects depends on traffic volume, so I think, not having the right volume will not make the PPP road project commercially viable to attract the needed investment. Trust me; the private sector will clamour for a PPP road project if it's commercially viable.

Views from public sector participant (P01):

I think a bankable project is all that private investors are looking for because having a bankable project means the project can attract loans base of the project cash flow…we have worked on a few reports and the prospect is good. However, as we speak, I think the only bankable project, for now, is the Accra- Tema Motorway, so I can confidently say that bankable project is a challenge within the Ghana roads sector. One key thing, in respect of a bankable project, is cash flow, which in many toll projects is from traffic volume and toll charges, but the traffic volumes on most of our roads are very low. I think the toll charges we pay in Ghana too need to be reviewed upwards, but the question is, do our politician have the political will to do that? It is not an easy thing!

Lack of Commercially Viable PPP Road Projects

Views from public sector participant (P01):

From the experience that I have had from other countries, PPP road projects must be able to generate enough money to meet the cash flow requirement, based on a financial model. Therefore, a road that cannot pay for itself cannot be considered a commercially viable

project. For now, the only project which we can say is a commercially viable project is the Accra-Tema motorway, and to me, it is a huge issue that we are confronting as a country.

Views from public sector participant (P02):

The traffic volumes are not motivating enough to attract private investors. For now, the only project we have which seems commercially viable is the Accra to Tema Motorway Project. The viability of the PPP road infrastructure projects depends on traffic volume, so I think not having the right volume will not make the PPP road project commercially viable to attract the needed investment. Trust me; the private sector will clamour for PPP road project if it's commercially viable.

Views from public sector participant (P05):

From my view, having a commercially viable project that will attract the private sector is crucial for a PPP project. I think we do not have many commercially viable projects, where the PPP investor will invest and recoup their investment.

Views from private sector participant (P09):

One other issue that I think is critical is that, for PPP road toll projects to be commercially viable, the road users must be made to pay a realistic charge. As we speak, our toll rate is low; the only way we can have commercially viable PPP projects is for road users paying realistic tolls, but for now, I am afraid. Because we are not willing to pay a realistic toll, which to me is an issue the government must confront.

Private Investors not able to Recoup their Investment within the Concession Period

Views from public sector participant (P05):

Every private investor who wants to invest will first enquire if his or her money can be recouped within the stipulated period and when he can get a return on investment or he will not invest; therefore my question is, Do we have a commercially viable road project in Ghana

where a private investor can recoup his or her investment? I am not sure. I think if we want the private sector to invest in PPP road projects, then we have to ensure our road toll is reasonable for the private investor to recoup their principal and their investment.

4.3.1.2.2 Economic and Financial Conditions – Theme 2

During the semi-structured interview, the issue of "economic and financial conditions" as a challenge that could prevent the private sector from investing in PPP road projects in Ghana was discussed. From Table 4.3, four challenges emerged from the interview data analysis:

1) local banks' inability to provide long-term loans for PPP road projects;
2) lack of access to finance for the PPP projects;
3) lack of strong local capital market for PPP projects;
4) unstable economic and financial conditions.

From the interview results, 60% (n=6) of the respondents were of the view that "local banks' inability to provide long-term loans for PPP projects" was an issue that can prevent the private sector from investing in PPP in Ghana, 30% (n=3) of the private sector respondents cited "lack of access to finance for PPP projects" as their issue, 10 (n=1) of the respondents mentioned "lack of strong local capital for PPP", and 50%(n=5) cited "unstable economic and financial conditions" as the factors that can prevent the private sector from investing in PPP road projects. Some of the views expressed under each sub-theme by the private and the public sector respondents are presented in the succeeding paragraphs:

Local Banks' Inability to Provide Long-Term Loan for PPP Road Projects

Views from private sector participant (P06):

When it comes to PPP, the initial capital requirement outlay is massive, and, in my view, our local banks do not have that capacity to fund PPP road infrastructure projects properly. Therefore, they need others to support them. Again, If an investor is to invest in PPP road infrastructure projects, I think they would like to use the local banks, but considering our local

banks, I do not think they can finance PPP road infrastructure projects unless they form a consortium. In this respect, we need a reform in line with the PPP concept.

Views from private sector participant (P09):

With most of the banks in Ghana, long-term loans usually originate from customers' long-term deposits. Considering the depositors' culture in Ghana, I doubt if the banks will be able to get the long-term deposits to give it out as a long-term loan for PPP road projects, taking into account the duration for PPP concession … In addition to this, our commercial banks lack the experience to support projects with long-term financing: PPPs. This is a new area where we need to do more.

Views from private sector participant (P10):

Macroeconomic stability, notably where inflation is high, there is a disincentive to save, because current earnings are worth more than future earnings in real terms, and financial markets will make available only short-term finance at variable rates. Therefore, the banks will not be in a position to give long-term loans to infrastructure projects. Meanwhile, a PPP project requires long-term finance at predictable (preferably fixed) interest rates.

Lack of Access to Finance for PPP Projects

Views from private sector participant (P10):

If the private sector investors were aware that they would be backed with capital, it would boost the interest to invest in PPP road projects. However, for now, that is not the case. I think it is because our financial market is not doing well. Therefore, the private sector cannot go smoothly and borrow the kind of money they will need to finance a huge road project. In other jurisdictions, their government is supporting them. So, I think it is something that the government needs to look at. Infrastructure funds and other long-term resource- mobilisation schemes, like using the pension fund, are avenues to raise local capital to support PPP projects. Other countries are doing it, and I think we must look at that as a country going forward.

Participant from the private sector (P10):

Local capital markets must be fully developed to support the private sector in financing PPP road projects. Government supplementing the private sector with financial support will increase the attractiveness of the PPP market to private investors.

Lack of Local Capital Market for PPP Road Projects

Views from public sector participant (P01):

I do know that most of the developed countries have relied on their local capital market for their infrastructure development, but our local market, I think it is fragile; it has not developed to the position where it can support the capital injection that is required for PPP road projects, taking into account the concession period.

Views from private sector participant (P09):

We have witnessed promising signs of slow progress in our capital market; the macroeconomic indicator is improving, which is a key indicator of a healthy economy, so we will get there with time, but for now, it seems that we do not have a strong local capital market to support our drive for infrastructure development.

Unstable Economic and Financial Conditions

Views from public sector participant (P02):

I think we need to work on our macro-economic indicators; having a stable micro-economy, reducing the rate of borrowing from the bank, bringing the depreciation of the cedi down to an appreciable level, and lowering the rate at which the commercial banks lend to borrowers will help a lot. This will encourage the private sector to borrow for projects.

Views from private sector participant (P 10):

Macroeconomic stability, notably in the country where inflation is high, there is a disincentive to save because current earnings are worth more than future earnings in real terms.

Therefore, the financial markets will make available only short-term finance at variable rates, and the banks will not be in a position to give long-term loans to infrastructure projects.

4.3.1.2.3 Political and Policy Issues – Theme 3

The respondents discussed the issue of "political and policy issues" as a challenge preventing the private sector from investing in PPP road projects in Ghana. From Table 4.3, seven (7) challenges emerged from the interview data analysis:

1) lack of suitable skills and experience of public sector professionals in PPPs;
2) absence of a clear institutional and PPP legal framework;
3) political instability;
4) risk of continuation of uncompleted PPP road projects by successive governments;
5) lack of government support for PPP road projects; and
6) lack of confidence in the country's legal system.

As presented in Table 4.2, both the private and the public sector respondents expressed their view on the issue. The respondents' responses on "policy and political factors" as follows: 50% (n= 50) of the respondents were of the view that "lack of suitable skills and experience of public sector professionals to manage PPPs" could prevent the private sector from investing in PPP road projects, 20% (n= 2) indicated "absence of a clear institutional and PPP legal framework" as their main issue, 40% (n= 4) cited "political instability" as their concern. "Political interference in PPP road projects" was mentioned by 30% (n=3) of the respondents during the face-to-face interviews, 40% (n=4) of the respondents also perceived "risk of continuation of uncompleted PPP road projects by successive governments" as an issue, 40% (n=4) of the respondents were of the view that "lack of government support for PPP road projects" can prevent the private sector from not investing in PPP projects. Lastly, 20% (n= 20) of the respondents agreed that "lack of confidence in the country's legal system" was an issue. Some of the views expressed under each sub-theme by both the private and the public sector respondents are presented in the following paragraphs.

Lack of Suitable Skills and Experience of PPP Professionals

Views from private sector participant (P 06):

> *Experience and skills are critical in PPP project implementation, and my view is, we lack competent and skilful PPP, public officials, to manage PPP road projects. Probably, it is because PPPs are new. However, in order to have a common baseline for PPP knowledge and best practice, there must be a policy to train and retain experienced and knowledgeable public officials.*

Lack of Clear Institutional and Legal Framework for PPP

Views from public sector participant (P 01):

> *From the market soundness and pre-qualification conference we have had so far, one thing that has come out strongly from the bidders is when the PPP law is going to come up, and I agree with them because they want some reassurance for their investment. Because Ghana is not a mature PPP market; it is an infant market, so they need some level of security and trust … I think it is a significant challenge.*

Views from private sector participant (P 09):

> *I will start with the policy side or from the front-line activities, which are the creation-enabling environment for PPP. The private sector will only come in when the enabling environment is created, which is the responsibility of the government. As you know, the institutional framework is not there, and the PPP law is not there, the legal formwork is not there; these are very critical, and without these, PPP road projects may not be attractive to the private sector. The enabling environment is created once you have the institutional and legal formwork in place.*

Political Instability

Views from public sector participant (P 04):

> *I think that every investor would like to invest in a relatively stable country; for some time now, Ghana has gained some successes to the admiration of other African countries, but we*

need to do everything possible to consolidate it. That is the only way to motivate private investors to invest in Ghana.

Views from private sector participant (P 06):

Although Ghana is a stable and peaceful country, there seems to be a heightened political tension in the country between some political activities during electioneering campaigns; this could send a wrong signal to the private investor that the country is not safe, so yes, political instability is something I would say could prevent the private sector from investing in PPP road projects.

Successive Governments not Continuing with PPP Road Projects

Views from public sector participant (P 05):

We have evidence of many projects dotted in almost all the regional capitals which successive governments have failed to continue, so if I am an investor, I will be cautious. I think there should be a policy to compel successive governments to continue with PPP projects already initiated, and that should be part of the PPP framework.

Views from public sector participant (P 06)

As you know, a PPP project takes much time to implement, and considering the 4-year political tenure we have in Ghana, the politicians are interested in a project that they can start and finish within their tenure of office. Therefore, they will not give the necessary support.

Views from private sector participant (P 07):

I think there must be a policy for the successive government to continue with already initiated PPP projects; otherwise, other politicians will come to power and terminate the PPP contract without recourse to the law.

Lack of Political and Government support for PPP Road Projects

Views from public sector participant (P 01):

> *From my experience, I think the politicians are not comfortable with the time it takes to roll out PPP road infrastructure projects; the process takes time, as it requires due diligence. and they are not happy about the time it takes*.

4.3.1.2.4 Public Support for PPP Road Projects - Theme 4

The respondents expressed their views on "public support issues for PPP road projects" as a challenge preventing the private sector from investing in PPP road projects in Ghana. From Table 4.3, three (3) challenges emerged from the interview data analysis:

1) public opposition to PPP road infrastructure projects;
2) road users not ready to pay realistic tolls and
3) road users using alternative roads rather than toll roads.

As presented in Table 4.2, the results from the interviews indicate that 30% (n=3) of the respondents agreed that "public opposition to the PPP road projects" can deter the private sector from investing in PPP road projects; 40% (n=4) of the respondents also mentioned "road users not ready to pay realistic tolls" as their issue, and finally, 30% (n=3) cited "road users using alternative roads rather than the toll roads" as their issue. Opinions expressed by the respondents (public and private sector) under each sub-theme are presented in the succeeding paragraphs:

Public opposition to PPP road infrastructure projects

Views from public sector participant (P02):

> *Even with the right traffic volume, we need the support of the public. If they oppose a PPP road project because of a road toll, it will scare the private sector from investing. I think we need to do more to sensitise the public before enrolling on any PPP road projects.*

Views from private sector participant (P10):

I think we need to also think about the public perception of PPP. If the public is not in support, there could be public unrest and all that. I also think our PPP market is not mature enough, and as a country, we need to do more in that regard.

Road Users not Ready to Pay Realistic Road Tolls

Views from public sector participant (P01):

We all appreciate the fact that there is the need to increase the road tolls to make the road infrastructure projects commercially viable, but there is a limitation on how much we can increase the road tolls as a developing country. If we are not circumspect, the populace will react negatively to an increase in road tolls.

Views from public sector participant (04):

Some road infrastructure projects may not be commercially viable; that is why the government comes in. The road could be an important road to the government, but the traffic and the financial model will not be attractive to the private sector if the toll rate is not increased. Therefore, we need to have a policy that allows for the review of the toll rates.

Views from private sector participant (P09):

We need to appreciate that if we accept PPP road infrastructure projects, there are roads that were not tolled before, so the users are going to begin to pay road tolls, and where there are already toll roads, the road tolls must go up. So, there is a lot that must be done on the issue of ability and willingness to pay and review of road tolls.

Views from private sector participant (P08):

If you take our country now, the question we must ask is whether there is a clear toll policy. Any investor who wants to invest wants to be sure that there is a clear toll policy, which allows for adjustment and re-adjustment of tolls. As it is now, it is the Ghana Road Fund that is supposed to adjust tolls; if I come in as a private sector [investor], where is the leeway? What can I do in terms of road tolls?

Views from public sector participant (P05):

Government has to determine the willingness of the road user to pay, and if they are not willing to pay, then the rate has to be reduced. If it is reduced, then the government must be ready to offer subsidies for the private sector. If yes, then it will be attractive for the private sector to come in. If the government is not willing to offer subsidies, and the road users are not willing to pay, then the private sector will not invest in road infrastructure projects. So that is where the public side comes in. We call it viability gap funding. If the government can take up the viability gap funding, then the private sector will come in because they know they will get back their investment.

Road Users Using Alternative Roads

Views from public sector participant (P05):

We should not lose sight of the fact that some of the road users could resort to the use of alternative roads, which will be a major challenge, as it will affect the traffic flow and consequently affect the revenue inflow.

Views from private sector participant (P06):

PPP road infrastructure projects are all about traffic volume; my worry is the road users may use alternative roads, and that could affect the economic viability of the project. This is a critical issue; we have to find a way of handling it going forward.

4.3.1.2.5 Corruption-Related Factors – Theme 5

From pieces of literature that were reviewed, the act of corruption was identified as an important risk to the construction industry. Thus, the participants' views on the issue were sought during the face-to-face interviews. From Table 4.2, three (3) challenges emerged from the data analysis and they are:

1) lack of transparency in the bidding process;
2) lack of transparency in information disclosure; and
3) lack of trust in public institutions to manage PPP projects.

From the interview results in Table 5.4, a significant number (70%, n=7) of the respondents mentioned “lack of transparency in the bidding process” as a critical issue that can prevent the private sector from investing in PPP road projects, while 20% (n=2) cited “lack of transparency in information disclosure” as the main issue. Lastly, 20% (n=2) also considered “lack of trust in public institutions to manage PPP projects” as their main issue. The views expressed by the participants (public and private sector) under each sub-theme are presented in the succeeding paragraphs.

Lack of Transparency in the Bidding Process

Views from private sector participant (P08):

> *I think to attract the private sector to invest their money in the road infrastructure projects through PPP; there must be transparency during the procurement stage of the project.*

Views from public sector participant (P02):

> *I think there is a lack of transparency during the bidding for projects; this will not boost the confidence of the private sector. We need to work at it because it does not make sense for an investor to invest money in bidding for a project in which the competition will not be fair; fairness in the process and the award of a contract are things investors are keen on.*

Lack of Trust in Public Institutions to Manage PPP projects

Views from private sector participant (P08):

> *Issues like corruption can never be ruled out in any economy. Sometimes, some of the things we hear are that investors come to the country to look for investment opportunities but are asked to give monies here and there, so they go away. It is a systemic problem. So, it cannot be ruled out. If you look at the corruption perception index, we are tagged as a corrupt country.*

Views from private sector participant (P09):

> *Corruption in business transactions is endemic in our society; it also happens in our institutions and agencies. We need to work at it if we need the private sector to invest in PPP road infrastructure projects.*

Lack of Transparency in Information Disclosure

Views from public sector participant (P05):

> *There have been situations when government employers keep relevant contract information from the private sector, and such practices are not a good signal for an investor who invests in PPP road infrastructure projects.*

4.4 Findings from the Semi-Structured Interview Data Analysis

Findings that resulted from the semi-structured interview analysis are summarised and detailed in Table 4.4.

Table 4- 4: Summary of factors that emerged from the semi-structured interviews

Themes	Factors emerged from the semi-structured interview	Participants
Economically viable PPP projects	Lack of bankable projects	$P_{01,}$ $P_{10,}$ $P_{07,}$ P_{03}, P_{04}, $P_{07,}$ P_{08} and P_{09}
	Low traffic volume	$P_{02,}$ P_{10} and P_{08}
	Lack of commercially viable PPP road projects to attract private investors	P_{01} and P_{07}
	Private investors not able to recoup their investment within the concession period	P_{05} P_{03}, P_{05}, P_{06} and P_{06}
Economic and financial conditions	Local banks' inability to provide long-term loans for PPP	P_{05}, $P_{01}P_{03}$, P_{05}, P_{06} and P_{07}
	Lack of access to finance for PPP project	P_{01}, P_{04}, P_{05} P_{08} and P_{09}
	Lack of strong local capital for PPP	P_{09} P_{02}, P_{03}, and P_{04}
	Unstable economic and financial conditions	P_{01}, P_{02}, P_{03}, P_{04}, $P_{07,}$ P_{08} and P_{09}
Policy and political factors	Lack of suitable skills and experience of PPP professionals	P_{01}, P_{02}, $P_{04,}$ P_{05}, and P_{09}
	Absence of clear institutional and PPP legal framework	P_{02}, and P_{08}
	Political instability	P_{03}, $P_{07,}$ P_{08} and P_{09}
	Risk of continuation of uncompleted PPP road projects by successive government	P_{01}, P_{04}, P_{07}, and P_{10}
	Lack of government support for PPP road projects	$P_{07,}$ P_{08} and P_{09}
Lack of public support for PPP road projects	Public opposition to the PPP road projects	P_{02}, P_{09} and P_{10}
	Road users not ready to pay realistic tolls	$P_{08,}$ $P_{09,}$ P_{02}, P_{03}, and P_{04}
	Road users using alternative roads rather than the toll roads	$P_{07,}$ P_{08} and P_{09}
Corrupt related factors	Lack of transparency in the bidding process	P_{02} and $P_{10,}$ $P_{07,}$ P_{03}, P_{04}, $P_{07,}$ P_{08} and P_{09}
	Lack of transparency in information disclosure	P_{08} and P_{09}

As presented in Table 4.4, 18 sub-themes emerged from the semi-structured data analysis. These factors represent what the interview participants (public and private sector) perceived as critical issues that could prevent the private sector from investing in PPP road projects in Ghana. The findings from the interview data analysis partially answer and fulfil the research objective 2 (i.e., Investigate the challenges preventing the private sector from investing in PPP road projects in Ghana).

Also, since the research adopted a sequential exploratory data collection approach, the issue that emerged from the data analysis has established the importance and pertinence issues from the Ghanaian roads sector perspective. These findings from the interview informed the content of the questions for the questionnaire survey (Saunders et al. 2016). This section has discussed the semi-structured interviews, regarding how the semi-structured interviews were analysed, and has also presented the results from the interviews. The following sections discuss the survey questionnaire data analysis.

4.5 QUANTITATIVE DATA ANALYSIS AND FINDINGS

4.5.1 Overview of Quantitative Data Analysis

As already discussed in section 3.16, a combination of descriptive statistics, mean ranking values, frequencies, standard deviation, Kendall's coefficient of concordance (W) and Mann-Whitney U test (P) analysis were employed for the quantitative data analysis. These analytical methods were considered suitable for data measured in ordinal or nominal scales (Takim & Adnan 2008; Easterby-Smith et al. 2002). The steps employed for data analysis are briefly discussed here for emphasis (see Figure 4.3)

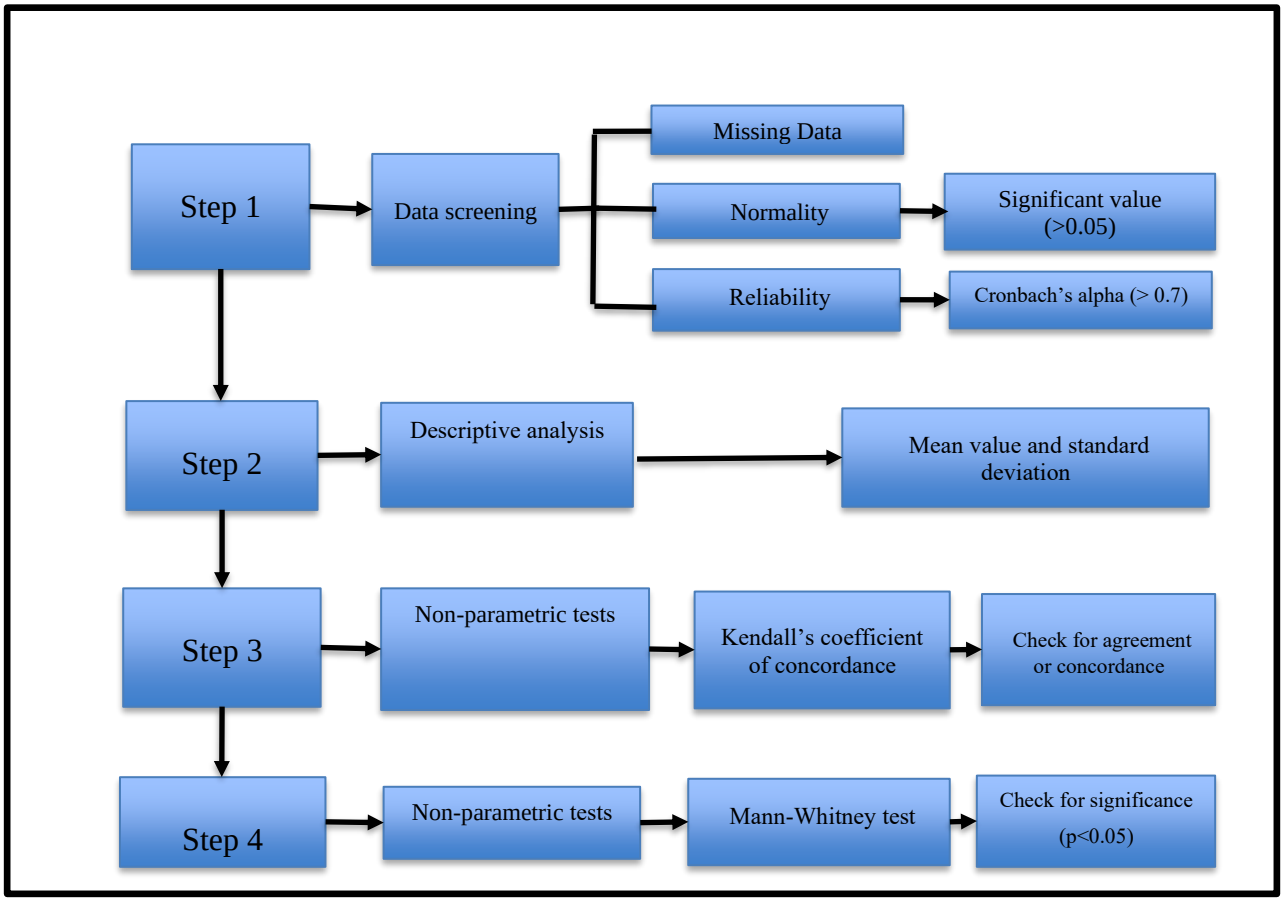


Figure 4- 3: Process of the quantitative data analysis process

Firstly, data screening was employed to understand how the respondents answered the questions and to check for evidence of bias to ensure that the questionnaires were fully completed. After checking

for uncompleted questionnaires and missing data, 168 of the responses were considered as fully completed and were subjected to further analysis. Secondly, the researcher conducted a normality test on the responses to assess the normality of the distribution of the scores. Results from the normality text (see section 3.16.1.1) indicate a non-significant of 0.00. The results signified that the Kolmogorov-Smirnov[a] values were less than 0.5. Thus, the value (0.00) obtained was considered not within the normality range. Therefore, the data were subjected to non-normality statistical analysis; in this case, a non-parametric statistical analysis, as discussed in section 3.16.3.

Questions 1 to 4 of the questionnaires focused on the demographic information of the respondents, while questions 5 to 10 contained ordinal variables. Therefore, a reliability test (see section 3.16.1.2) was conducted on the ordinal variables using Cronbach's Alpha in checking for the internal consistency of the data. The Cronbach's Alpha results indicate a Cronbach's Alpha value of 0.743, with 18 items. These results suggest that the respondents agreed on most of the variables.

The survey respondents in this study were based on two groups (the public sector and the private sector). Therefore, Kendall's concordance analysis was conducted to measure the level of agreement or otherwise of the respondents' responses within the groups. The assumption was that if Kendall's coefficient of concordance (W) is significant at a pre-defined allowable significance level of, say 0.05, a reasonable degree of agreement exists between the respondents on the rankings of factors. As discussed (see section 3.16.3.2), a Mann-Whitney U test was also undertaken to examine the level of agreement between stakeholders with the rating of the significance of the issues to determine whether the mean significance of each issue is equal between the groups (Zhang 2006). The data analysis of the specific questions was carried out in the order the questions were set out in the questionnaire. The results from the quantitative data analysis are discussed in the following sections.

4.5.2 Demographic Information of the Respondents

Four questions corresponded to the demographic information of the respondents. The first question is about the respondents' organisation. Then the respondents were asked about their current job title as question two. In question three, the respondents were asked to indicate their specific experience relative to their knowledge and experience of PPPs. The fourth and final question under this section

requested the respondents to indicate the sector in which their organisation operates. The participants' background information was valuable data, as various groups of participants could potentially hold different views on the same subjects (Osei-Kyei et al. 2014). Therefore, it was important to organise the data according to the participants' profile in order to improve the reliability and validity of the research findings.

4.5.2.1 Respondents' Organization

The researcher was of the view that the participants' organisation could affect their responses. Therefore, to understand this aspect, the respondents were asked to indicate the organisation for which they worked. The results, as presented in Figure 4.4, indicate that 54% (n=91) of the participants were from construction consultancy firms, 26% (n=44) from clients/employers, 10% (n=16) worked with a contracting organisation, 7% (n=12) were from financial and banking institutions, while 3% (n=5) represent academia. As observed from the results, the majority of the respondents (54%) were working with consulting firms. The results indicate that respondents from the private sector (consulting firms) have more knowledge and exposure to the PPP practice compared to respondents from the other sectors.

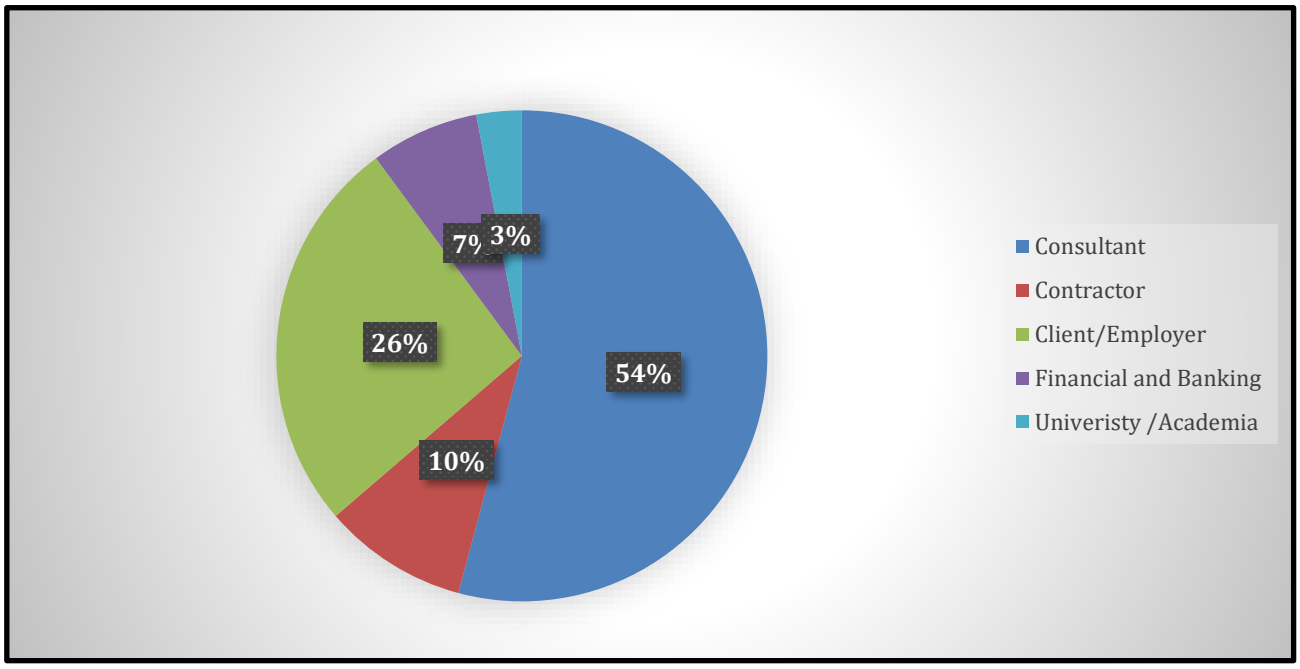


Figure 4- 4: Survey respondents' organisation

4.5.2.2 Respondents' Professional Background

The survey respondents were asked to indicate their profession. This was to understand the respondents' background and how they would respond to the questions. The information submitted was further analysed. As shown in Figure 4.5, the results indicate that 9% (n=15) of the participants were construction managers, while construction project managers represent 4% (n=7), quantity surveyors 30% (n=50), civil engineers 50% (n=84), and architects, electrical engineers, structural engineers and planners represent 7% (n=12). Due to the nature of the research questions and objectives, the professionals with the most relevant information were those from the construction industry, and the information indicates that a large proportion of the participants were from the construction industry; this can be attributed to the distribution strategy adopted by the researcher. Among the respondents, civil engineers represent the majority (50%).

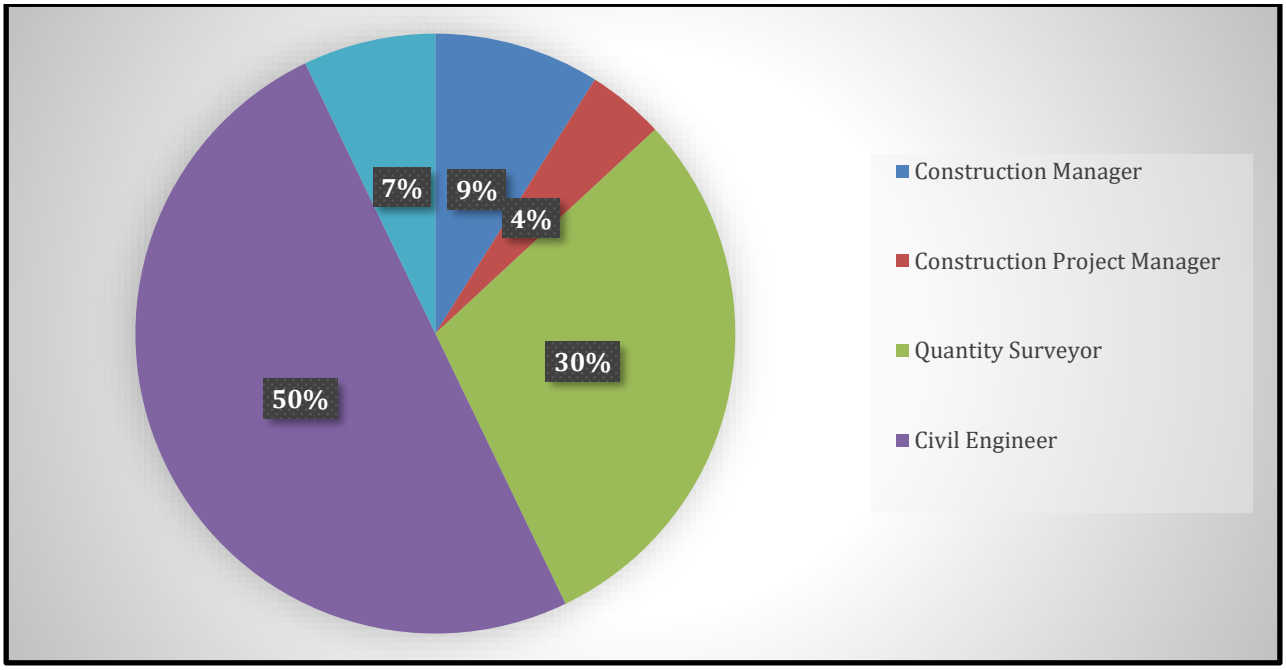


Figure 4-5: Survey respondents' professional background

4.5.2.3 Respondents' Experience and Knowledge in PPP

As presented in Figure 4.6, the respondents whose experience and knowledge was between 0-5 years represent 30% (n= 50), those with experience and knowledge ranging from 6-10 years represent 50% (n= 85), respondents with experience and knowledge in PPPs ranging from 11-15 years represent 15% (n=25), while those with over 20 years represent 5% (n= 8). As the results indicate, the majority (50%) of the respondents with experience and knowledge of PPPs were those whose level of experience ranged from 6 -10 years.

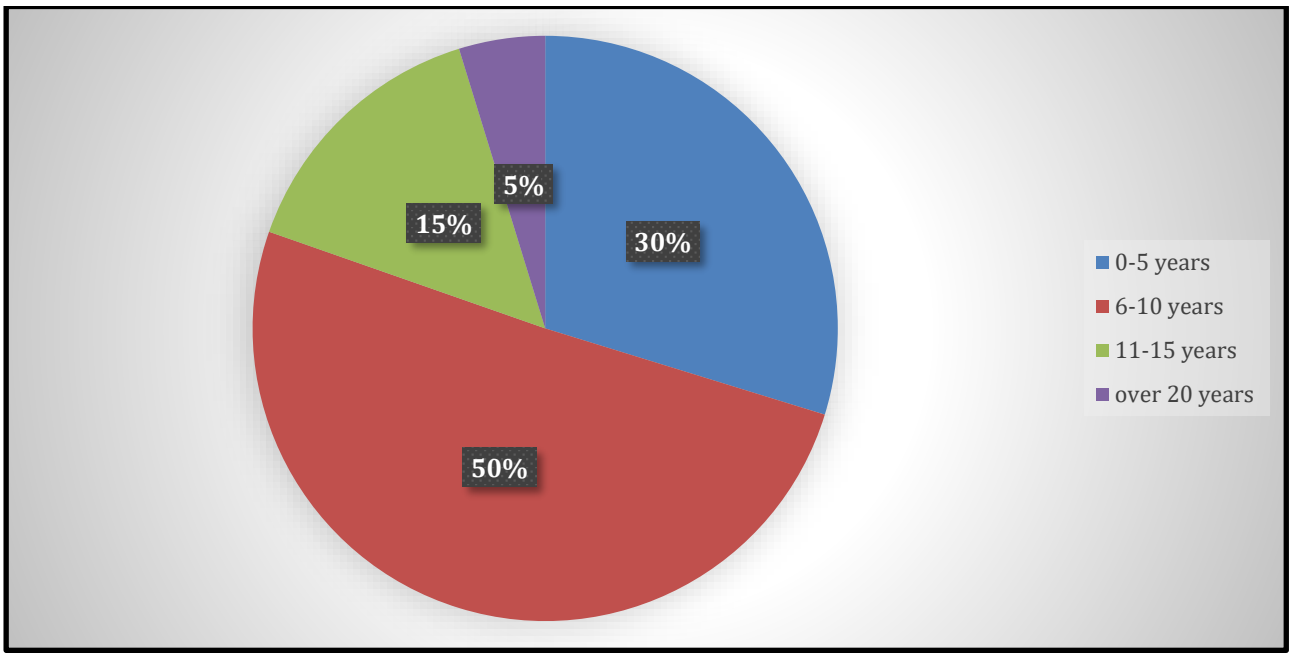


Figure 4-6: Respondents' knowledge and experience in PPPs

4.5.2.4 Respondents' Sector

Identifying the sector within which the respondents worked was necessary, as the public and the private sector participants could have a different view on the phenomenon under study depending on their organisation. Therefore, the participants were asked to indicate the sector within which they worked. It can be seen from Figure 4.7 that 57% (n=96) of the participants were from the private sector, while the public sector represents 43% (n=72). As presented in the results, many of the respondents

were from the private sector, representing 59%, compared to the respondents from the public sector. This information helped in putting the responses from the participants into perspective during the detailed data analysis and discussion phase of the report.

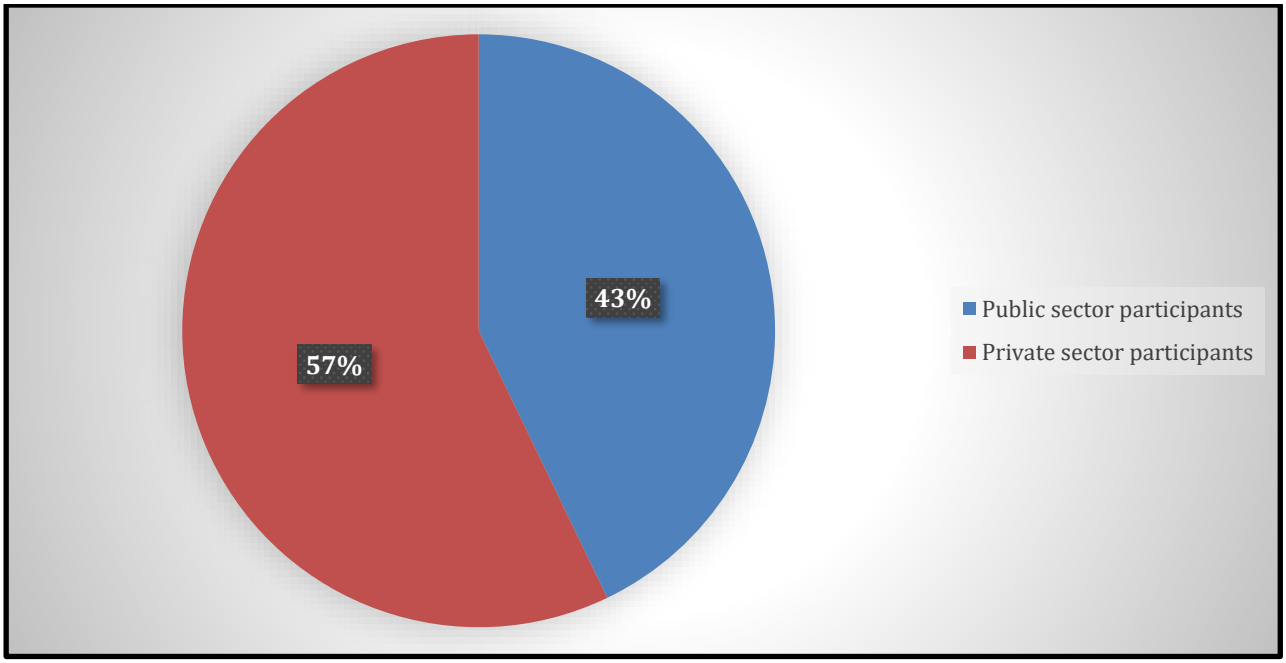


Figure 4- 7: Sector of survey respondents

4.5.2.5 Respondents' Knowledge and Experience in PPP

The respondents were asked to indicate their level of knowledge and experience in the PPP method of procuring and financing projects. As presented in Figure 4.8, 3% (n=5), 32% (n=54), 42.3% (n=71) 19.6% (n=33) and 3% (n=5) had knowledge and experience in the PPP method of procuring and financing infrastructure, respectively. From the data presented, about 97% of the respondents had knowledge or experience of PPP. The percentage of respondents' who has experience and knowledge in PPP gives validity to the question responses.

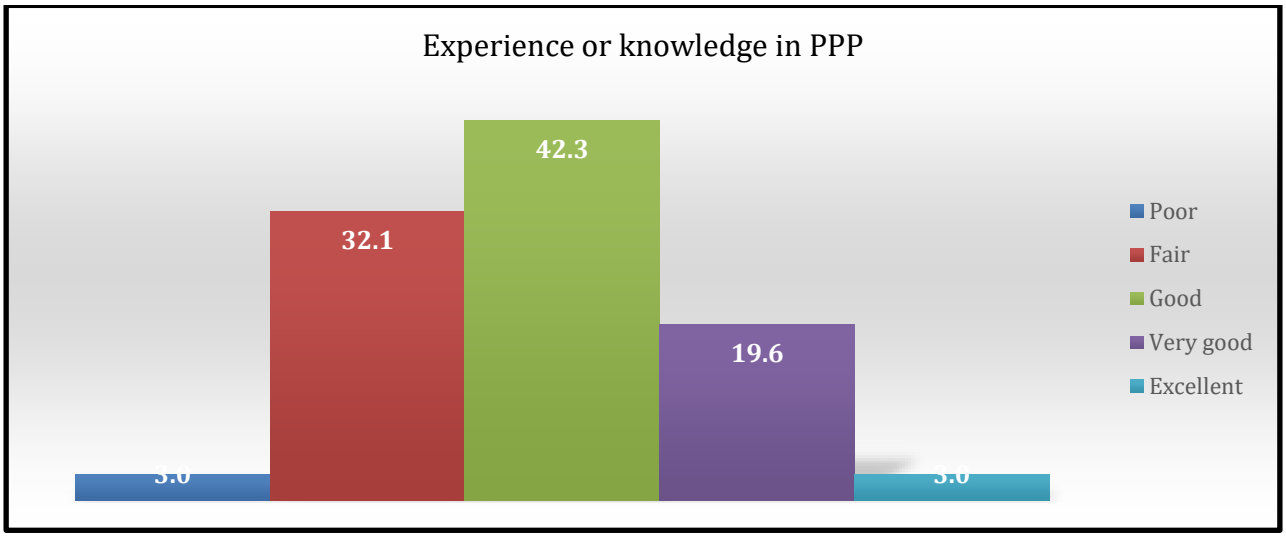


Figure 4- 8: Participants' knowledge or experience of PPP

4.5.3 Ranking of Factors that could Prevent the Private Sector from Investing in PPPs

From the literature review and the semi-structured interviews conducted with PPP practitioners and experts in Ghana, it was observed that some challenges prevent the private sector investors from investing in PPP road projects in Ghana. Therefore, the views of some selected professionals within the Ghanaian construction industry were sought through a questionnaire survey to ensure the validity of the issues that emerged from the semi-structured interview. The participants were asked to indicate their level of agreement and disagreement on a 5-point Likert scale of 1 = strongly disagree 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. A value above "3" would indicate whether the issues were of importance or not. The outcome of the questionnaire survey is discussed in the subsequent sections.

4.5.3.1 Ranking of Economic and Financial Condition-Related Factors

As presented in Table 4.5, seventy-two (72) and ninety-six (96) public and private sector respondents respectively participated in the questionnaire survey. The results indicate that the top three (3) economic and financial conditions related challenges ranked by the public sector are as follows:

1) local banks inability to provide long term loans for PPP road projects;

2) Lack of strong local capital for PPP; and
3) Unstable macro-economic conditions.

As detailed in the table, the results indicate that both the public and the private sector ranked the top three economic issues the same. The results indicate that the mean values from the public sector participants range between 3.63 and 4.04, while the private sector participants range between 3.68–4.20. These values were above the medium level "3" of the 5-point Likert scale; therefore, it is an indication that from the participants' perspective, all the economic and financial issues were significant factors that could prevent the private investor from investing in PPP road projects in Ghana.

Table 4- 5: Statistical mean and standard deviation of economic and financial factors

Economic and Financial Factors related	**Public Sector**				**Private Sector**	
	N	**Mean Score**	**Rank**	**N**	**Mean Score**	**Rank**
Local banks' inability to provide long-term loans for PPP	72	4.0417	1	96	4.1964	1
Lack of access to finance for PPP projects	72	3.6390	4	96	3.679	4
Lack of mature local financial capital market for PPP projects	72	3.9028	2	96	3.8512	2
Unstable economic and financial conditions	72	3.7222	3	96	3.7083	3

N= Number of survey respondents

4.5.3.2 Ranking of Economic Viability of PPP Projects

The three top economic viability PPP project issues from the public sector respondents' perspective that can prevent the private sector from investing in PPP road projects in Ghana as detailed in Table 4.6 are as follows:

1) private investors not able to recoup their investment within the concession period;
2) lack of bankable projects; and

3) lack of commercially viable PPP road projects to attract private investors.

As presented in Table 4.6, the private and the public sector respondents ranked "lack of bankable projects" first and second, respectively. Surprisingly, "lack of commercially viable PPP road projects to attract private investors", which was ranked third by the public-sector participants, was ranked fourth by the private-sector participants. However, one would have thought that "lack of commercially viable PPP road projects to attract private investors" would be a significant issue for the private-sector participants. The reason for this may be that the private-sector participants could not appreciate the significance of the issue. Nonetheless, the mean values for the public and the private sector participants were above the medium level "3" of the 5-point Likert scale (strongly disagree =1, and strongly agree = 5), signifying that the issues were important to both groups.

Table 4- 6: Statistical mean and standard deviation of economic viability factors

Economic Viable Project Factors	**Public Sector**				**Private Sector**	
	N	**Mean Score**	**Rank**	**N**	**Mean Score**	**Rank**
Lack of bankable projects	72	3.8333	2	96	3.6771	1
Low traffic volume projection	72	3.4861	4	96	3.5000	3
Lack of commercially viable PPP road projects to attract private investors	72	3.5000	3	96	3.4583	4
Private investors not able to recoup their investment within the concession period	72	4.0000	1	96	3.5625	2

N= Number of survey respondents

4.5.3.3 Ranking of Political and policy-related Issues

The three top "political and policy-related issues" that can prevent the private sector from investing in PPP road projects as ranked by public sector participants are presented in Table 4.7 as follows:

1) non-continuation of uncompleted PPP road projects by the successive government;
2) absence of clear institutional and PPP legal framework, and
3) Political instability

Details that emerged from the results indicate that the three top political and policy-related issues were ranked first, second, and third, respectively, by both the private sector and the public sector respondents. The ranking demonstrated that "non-continuation of uncompleted PPP road projects by successive governments", "political interference on PPP road projects" and "absence of clear institutional and PPP legal framework" were essential irrespective of the sectors. The results further indicate that the mean values for the public and the private sector participants were between 3.18 and 3.96, and for the public-sector participants were between to 3.29 and 3.87; these values were above the medium level of the 5-point Likert scale (strongly disagree =1, and strongly agree = 5). Therefore, it can be concluded that both the private sector and the private sector considered the issues as necessary. It is, however, unsurprising that both the private sector and the public sector respondents rated "non-continuation of uncompleted PPP road projects by successive governments" as the most important issue under the "political and policy-related issues" because there have been situations in Ghana where road projects were terminated or cancelled by successive governments, which is probably the justification for that ranking.

Table 4- 7: Statistical mean and standard deviation of political and policy-related factors

Political and Policy Factors	**Public Sector**				**Private Sector**	
	N	**Mean Score**	**Rank**	**N**	**Mean Score**	**Rank**
Lack of suitable skills and experience of PPP professionals	72	3.444	4	96	3.177	5
Absence of clear institutional and PPP legal framework	72	3.681	2	96	3.720	2
Political instability	72	3.6389	3	96	3.6146	3
Non-continuation of uncompleted PPP road projects by successive governments	72	3.8750	1	96	3.9688	1
Lack of government support for PPP road projects	72	3.2917	5	96	3.2604	4

N= Number of survey respondents

4.5.3.4 Ranking of Corruption-Related Factors

As presented in Table 4.8, the results indicate that the public sector respondents rated "lack of transparency in information disclosure" as the most critical factor, with a mean value of 3.56. This same factor was ranked second by the private-sector respondents, with a mean value of 3.48. "Both the private and public sector respondents rated "lack of transparency in the bidding process" as the least important factor with a mean value of 3.36 and 3.44 respectively.

Table 4- 8: Mean and standard deviation results of corruption-related factors

Corruption	Public Sector			Private Sector		
	N	Mean Score	Rank	N	Mean Score	Rank
Lack of transparency and competitive bidding process	72	3.4444	2	96	3.3646	2
Lack of transparency in information disclosure	72	3.5556	1	96	3.4792	2

N= Number of survey respondents

4.5.3.5 Ranking of Public Support Issues

Table 4.9 demonstrates the mean ranking of the public-support related issues that can prevent the private sector from investing in PPP road projects. The mean ranking was used to identify the most significant public-support related factors that could prevent the private sector from investing in PPP road infrastructure projects in Ghana.

As presented in the table, the mean values of all the factors relative to the public sector were between 2.76 to 3.83, while the private sector mean values were between 2.67 and 3.68. In effect, one of the factors (public opposition to the PPP road projects) was below the medium level "3" of the 5-point Likert scale. However, further analysis indicated that there was a significate positive relationship among the public and the private sector participants (see Table 4.21), and there were no statistically significant differences among the participants (see Table 4.26).

Table 4- 9: Mean and standard deviation results of public-support-related issues.

Public Support Factors	Public Sector			Private Sector		
	N	Mean Score	Rank	N	Mean Score	Rank
Public opposition to the PPP road projects	72	2.7639	3	96	2.6667	3
Road users not ready to pay realistic tolls	72	3.8333	1	96	3.6771	1
Risk of road users using alternative roads rather than the toll roads	72	3.472	2	96	3.500	2

N= Number of survey respondents

4.5.4 Comparison of Private and Public Sector Opinions

Researchers over the years have done a range of comparative analyses on various aspects of PPP project implementation. As pointed out by Jayasuriya (2017), these studies compared the opinions of different stakeholders involved in PPP implementation. For example, Babatunde and Perera (2017) carried out a cross-sectional comparison of the public-private partnerships in transport infrastructure development in Nigeria. Again, Jayasuriya (2017) also compared stakeholder management issues between the public sector and the private sector. These comparative studies indicated that different stakeholders in a PPP arrangement could have different opinions on various aspects of a project.

This position can better be appreciated by examining the opinions expressed by the public and the private sector participants on the "challenges that can prevent the private sector from investing in PPP road projects in Ghana". From the interview results, different views were expressed on the same phenonium under study. This reaffirmed the need to explore further the differences between the private and public sector participants. In order to explore the differences in opinion of the public and private sectors, the mean-variance, as indicated in Tales Table 4.10 – 10.14, was used to explore the differences between the private and public sectors. Additionally, a graphical radar chart was plotted to compare the marginal differences between the two groups.

4.5.4.1 Comparison of Economic and Financial Factors – Private Sector vs. Public Sector

The analysis of the public and the private sector was done separately, and the results are shown in Table 4.10 and Figure 4.9. The comparative analysis from the perspective of the private and the public sector respondents indicates that the opinions were only marginally different between the two groups. Most of the issues which were important for the private sector were same for the public sector, except "local banks' inability to provide long-term finance for PPP road projects" which had the highest mean-variance of 0.15 between the private sector and the private sector mean values. These differences were addressed using a more reliable statistical analysis tool. Hence, the Mann-Whitney U test was used to test the statistically significant differences in the perceptions of the public sector and the private sector (see Table 4. 20), which indicate that there were no significant differences between the two groups.

Table 4- 10: Comparison of Private vs. Public views on Economic and Financial Condition Factors

Economic and Financial Factors	Public Sector		Private Sector		Mean-Variance
	Mean Score	Standard variation	Mean Score	Standard variation	
Local banks' inability to provide long-term loans for PPP	4.0417	0.97	4.1964	0.8	0.15
Lack of access to finance for PPP projects	3.639	1.17	3.679	0.95	0.04
Lack of strong local capital for PPP	3.9028	0.95	3.8512	1.01	0.05
Unstable economic and financial conditions	3.7222	0.89	3.7083	0.95	0.01

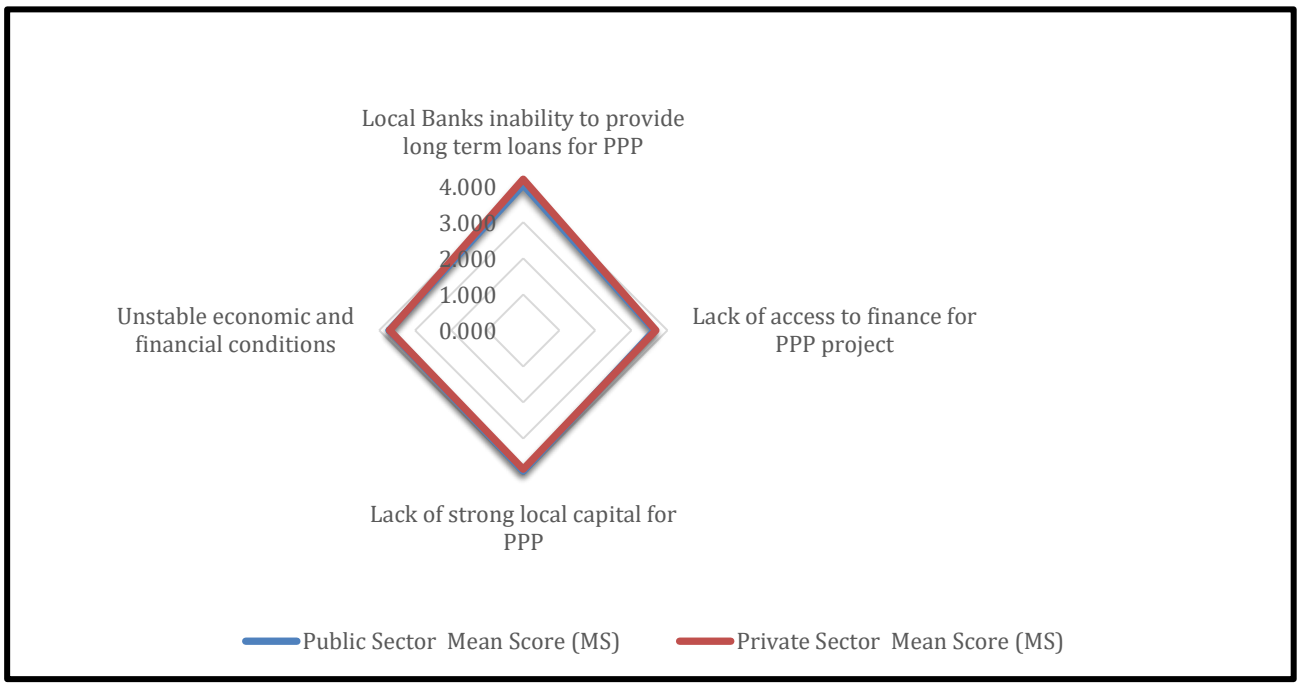


Figure 4- 9: Comparison of private vs public views on economic and financial conditions

4.5.4.2 Comparison of Factors related to Economic Viability of PPP Projects - Private vs. Public Sector

The results of the mean values for "economic viability of PPP projects" are shown in Table 4.11 and Figure 4.10. The results, as shown in Figure 4.10, indicate that there was a variance of 0.44 between the public and the private sector mean values for "private investors not able to recoup their investment within the concession period". This indicates that the views of the groups on this issue were not marginally. Therefore, the Mann-Whitney U test was conducted, which confirmed that there were statistically significant differences in the perceptions of the public sector and the private sector (see Table 4. 21) regarding "private investors not able to recoup their investment within the concession period". Therefore, the factor was removed from the list of factors.

Table 4- 11: Comparison of Private vs. Public views on Economic Viability of PPP Projects

Economic Viability of PPP Projects	Public Sector		Private Sector		Mean-Variance
	Mean Score	Standard variation	Mean Score	Standard variation	
Lack of bankable projects	3.8333	1.03	3.6771	1.14	0.13
Low traffic volume	3.4861	1.02	3.5	1.02	0.01
Lack of commercially viable PPP road projects to attract private investors	3.5	1.27	3.4583	1.25	0.04
Private investors not able to recoup their investment within the concession period	4.00	0.87	3.5625	1.13	0.44

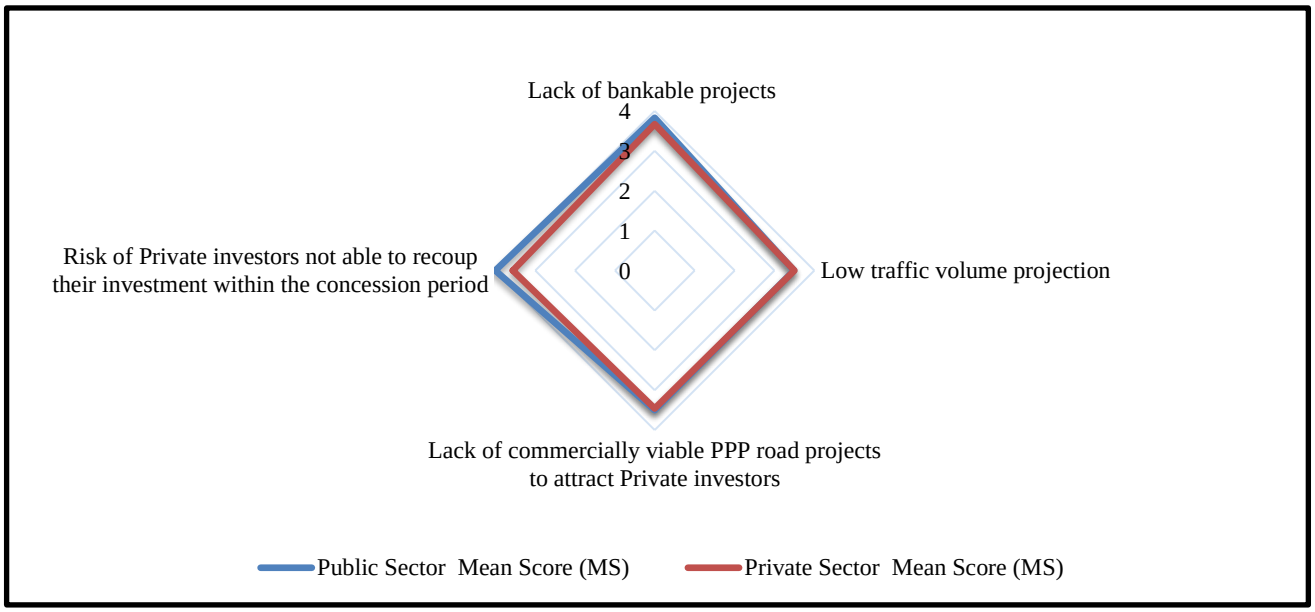


Figure 4- 10: Comparison of Private vs. Public views on Economic Viability of PPP Projects

4.5.4.3 Comparison of Political and policy-related Issues - Private vs. Public Sector

The results of the mean values for the "political and policy factors" are shown in Table 4.12 and Figure 4.11. As presented in Figure 4.11, the results indicate that opinions from the private and the public sector respondents were only marginally different between the two groups. Most of the issues were as necessary for the private sector as they were for the public sector, except "lack of suitable

skills and experience of PPP professionals" which had the highest mean-variance of 0.27 between the private sector and the private sector. As presented in Table 4.22, thus, the Mann-Whitney U test was conducted to understand the perception of the two groups on this issue. The results indicate that there were no statistically significant differences in the opinion of the public and the private sector.

Table 4- 12: Comparison of Private vs. Public views on Political and Policy factors

Political and Policy-related Factors	Public Sector		Private Sector		Mean-Variance
	Mean Score	Standard variation	Mean Score	Standard variation	
Lack of suitable skills and experience of PPP professionals	3.444	1.2	3.177	1.26	0.27
Absence of clear institutional and PPP legal framework	3.681	1.09	3.72	0.86	0.04
Political instability	3.6389	0.98	3.6146	0.99	0.02
Risk of continuation of uncompleted PPP road projects by successive governments	3.875	1.07	3.9688	0.96	0.09
Lack of government support for PPP road projects	3.2917	1.25	3.2604	1.15	0.03

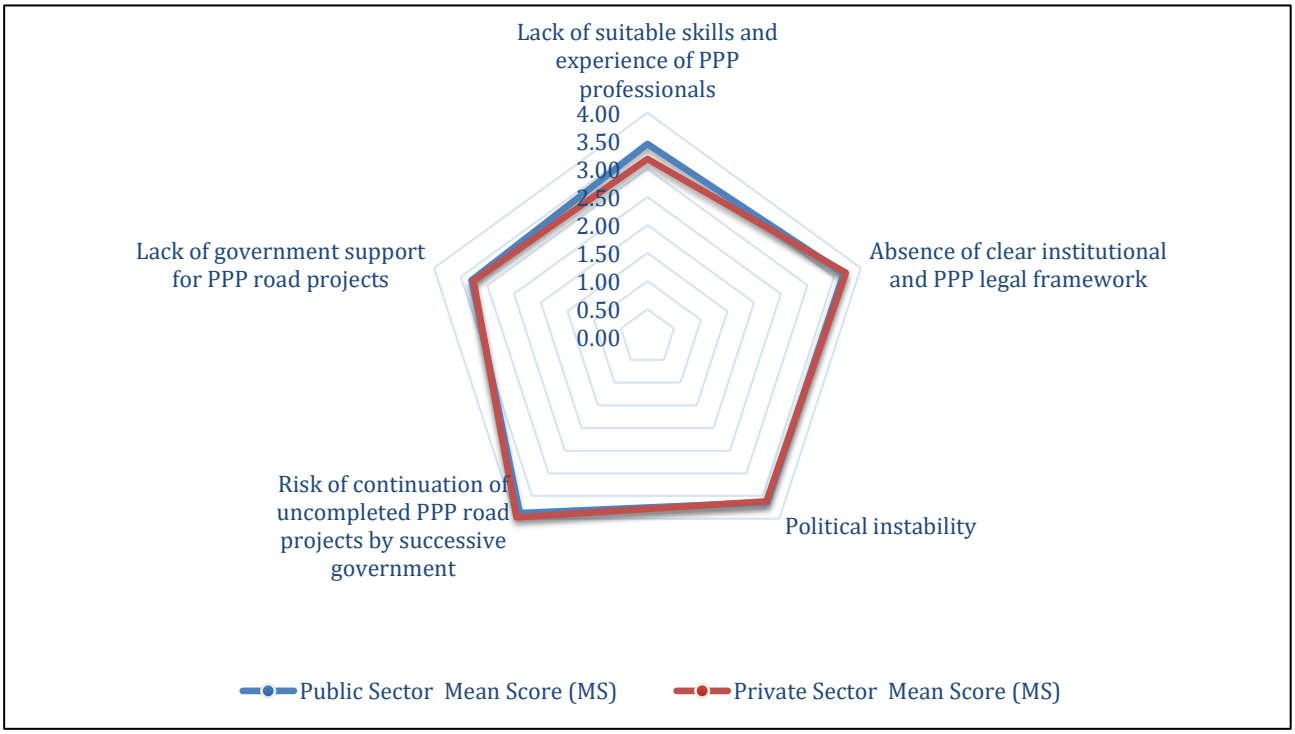


Figure 4- 11: Comparison of private vs public views on political and policy factors

4.5.4.4 Comparative of Corruption-Related Issues – Private Sector vs Public Sector

The results of the mean values for the corruption-related issues are shown in Table 4.13 and Figure 4.10. As presented in Figure 4.10, the results indicate that opinions from the private and the public sector respondents were only marginally different between the two groups. Most of the issues which were important for the private sector were also important for the public sector. A further Mann-Whitney U test result indicated (see Table 4.23) indicate that there were no statistically significant differences in the views of the public and the private sector.

Table 4- 13: Comparison of private vs public views on corruption-related issues

Corruption-related issues	Public Sector		Private Sector		Mean-Variance
	Mean Score	Standard variation	Mean Score	Standard variation	
Lack of transparency in the bidding process	3.4444	1.2	3.3646	1.08	0.13
Lack of transparency in information disclosure	3.5556	0.99	3.4792	1.13	0.08

4.5.4.5 Comparison of Public Support Factors - Private Sector vs Public Sector

The results of the mean values for the public support issues are shown in Table 4.14 and Figure 4.12. The results, as presented in Figure 4.12, show that opinions from the private and the public sector respondents were only marginally different between the two groups. Most of the issues which were essential for the private sector were also important for the public sector, while “road users not ready to pay realistic tolls” had the highest mean-variance of 0.16 between the private sector and the private sector. However, the Mann-Whitney U test result (see Table 4.24) indicated that there were no statistically significant differences between the views of the public and the private sector.

Table 4- 14: Comparison of private vs public views on public support issues

Public support factors	Public Sector		Private Sector		Mean-Variance
	Mean score	Standard variation	Mean score	Standard variation	
Public opposition to PPP road projects	2.7639	1.08	2.6667	1.03	0.13
Road users not ready to pay realistic tolls	3.8333	1.03	3.6771	1.14	0.16
Risk of road users using alternative roads rather than the toll roads	3.472	1.13	3.5	1.2	0.03

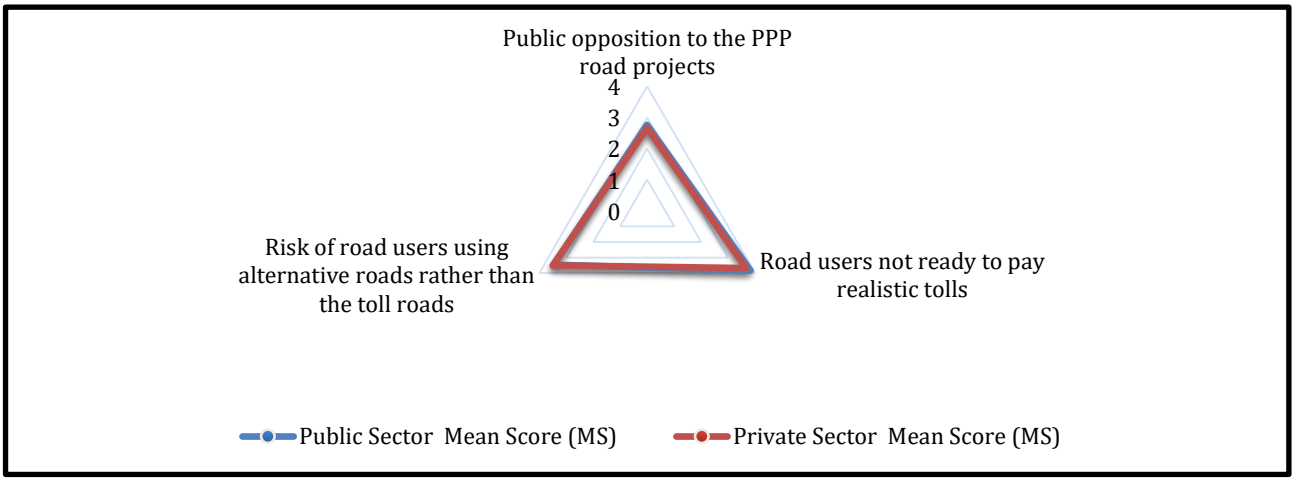


Figure 4- 12: Comparison of private vs public views on public support issues

4.5.5 Statistical Test

Further, a statistical analysis was conducted on the data, as discussed in section 3.16.3. This section explained the various statistical tools which were employed. As pointed out by Akoti (2014), there is a wide range of statistical tests that can be used depending on the type of data available. Nonetheless, this study conducted Kendall's coefficient of concordance analysis on the survey data in each group (public and private). The aim was to assess the level of agreement between the different stakeholders (Osei-Kyei and Chan 2017). Additionally, a Mann–Whitney U test was also carried out to determine whether there were any statistically significant differences in the perception of the different groups

on the issues under study (Osei-Kyei and Chan 2017; Esther 2009). The statistical test which was carried out are detailed in the subsequent sections

4.5.5.1 Kendell's Coefficient of Concordance (Non-Parametric Test)

The survey respondents for this study were from the public and private sector. Thus, it was pertinent to test the level of consistency among responses within each of the groups. Therefore, Kendall's coefficient of concordance analysis was conducted at a predetermined significance test value of 0.05, for economic and financial issues, economic viability issues, political and policy issues, corruption-related issues and public sector support-related issues (Osei-Kyei and Chan 2017; Cheung et al. 2012) Accordingly, the results of the analysis are discussed in the subsequent sections.

4.5.5.1.1 Agreement of Survey Respondents on the Economic and Financial Condition Factors

As presented in Table 4.15, Kendall's coefficient of concordance (W) for the ranking of results of the economic and financial factors was 0.05 and 0.12 for "public sector" and "private sector" respectively. The computed asymptotic significance value for all was at 0.00. As indicated in the table, the W-values obtained were not less than the predetermined significance test value of 0.05. Therefore, the assessment of the respondents within each group of their rankings of the economic and financial condition factors is proved to be consistent. This finding shows that the completed questionnaires were valid for further analysis.

Table 4- 15: Results of Kendall's analysis for economic and financial condition factors

Characteristics	**Public Sector**	**Private Sector**
Number of survey respondents	72	96
Kendall's coefficient of concordance (W)	0.05	0.12
Chi-square	18.071	57.626
Degree of freedom (df)	5	5
Asymptotic significance	0.00	0.00

4.5.5.1.2 Agreement of Survey Respondents on the Economic Viability of PPP Project Factors

As demonstrated in Table 4.16, Kendall's coefficient of concordance (W) for the ranking of issues affecting the economic viability of PPP project that can prevent the private sector from investing in PPP road projects in Ghana was 0.063 and 0.008 for the public and private sectors respectively, with an asymptotic significance value of 0.001 and 0.552. The test result indicates that the W-values obtained for the private sector were 0.008. This was less than the predetermined significance W-value of 0.05. Which suggests that there was no consistency among the respondents within each group. Therefore, the results from the private sector were subjected to a Mann–Whitney U test analysis. The Mann-Whitney U test (see Table 4.21) indicates that there was a statistically significant difference among the participants. Therefore, one of the factors under "economic viability of PPP project" issues was removed from the list of factors, as previously mentioned.

Table 4- 16: Results of Kendall's analysis for the Economic Viability of PPP Project issues

Characteristics	**Public Sector**	**Private Sector**
Number of survey respondents	72	96
Kendall's coefficient of concordance (W)	0.063	0.008
Chi-square	18.007	3.038
Degree of freedom (df)	4	4
Asymptotic significance	0.001	0.552

4.5.5.1.3 Agreement of Survey Respondents on Political and policy-related Factors

Table 4.17 presents Kendall's coefficient of concordance (W) for the ranking of political and policy factors that can prevent the private sector from investing in PPP road projects in Ghana. The W-value ranking of results for the public sector was 0.053 for the public sector and 0.078 for the private sector. The computed asymptotic significance value for all was at 0.00. The results indicate that the W-values obtained were higher than the predetermined significance test value of 0.05. The results show that the assessment by the private and public sector respondents proved to be consistent and thus reaffirms the validity of the survey responses for further analysis.

Table 4- 17: Results of Kendall's analysis for political and policy factors

Characteristics	Public Sector	Private Sector
Number of survey respondents	72	96
Kendall's coefficient of concordance (W)	0.053	0.078
Chi-square	18.552	45.08
Degree of freedom (df)	6	6
Asymptotic significance	0.00	0.00

4.5.5.1.4 Agreement of Survey Respondents on Corruption-Related Factors

From the results presented in Table 4.18, Kendall's coefficient of concordance (W) results were 0.003 and 0.011, with the significant asymptotic value of 0.788 and 0.341 for public and private sector participants, respectively. The W-values obtained for both groups (i.e., private and public sectors) were less than the pre-fixed significant W-value of 0.05. The result indicates that there was no agreement among the public and the private sector participants on the corruption-related issues. Nonetheless, the participants' responses were subject to a Mann–Whitney U test to understand the significant differences in the perception of each group of participants on the public support issues. The Mann–Whitney U test (see Table 4.23) suggested that there was no statistically significant difference among the participants. Therefore, none of the factors under the corruption-related factors was deleted from further analysis.

Table 4- 18: Results of Kendall's analysis for corruption-related factors

Characteristics	Public Sector	Private Sector
Number of survey respondents	72	96
Kendall's coefficient of concordance (W)	0.003	0.011
Chi-square	0.476	2.15
Degree of freedom (df)	2	2
Asymptotic significance	0.788	0.341

4.5.5.1.5 Agreement of Survey Respondents on Public Support for PPP Road Projects

As shown in Table 4.19, the results for Kendall's coefficient of concordance (W) conducted at a fixed significance level of 0.05 indicate that there was an agreement among the public and the private sector participants on "public support for PPP factors" that could prevent the private sector from investing in PPP road projects in Ghana. The W-values results were 0.252 and 0.167 for the public and private sectors, respectively, with both groups attaining an asymptotic significance level value of 0.000 for both groups. The W-values obtained were higher than the fixed significant W-value of 0.05. Therefore, it was concluded that there was a significant positive relationship between the public and the private sector participants. Thus, the participants' responses were subject to further analysis.

Table 4- 19: Results of Kendall's analysis for Public Support for PPP road projects

Characteristics	**Public Sector**	**Private Sector**
Number of survey respondents	72	96
Kendall's coefficient of concordance (W)	0.252	0.167
Chi-square	54.459	48.224
Degree of freedom (df)	3	3
Asymptotic significance	0.00	0.00

4.5.5.2 Mann-Whitney U Test (Non-Parametric Test)

The next stage of the analysis was to test whether there were any statistically significant differences amongst the respondents from the two groups (i.e., public sector and private sector). This was determined by using the Mann-Whitney U test. The Mann-Whitney U test was conducted using the null and the alternative hypotheses, as mentioned previously(see 3.16.3.2). The p-value was used to decide whether the null hypothesis can be rejected or retained. In this regard, the null hypothesis was mainly a hypothetical claim that there is no difference between the groups concerning the responses from the 168 respondents. If the p-value is less than "alpha", which is set at 0.05, then the null

hypothesis can be rejected, and it is accepted that there is a significant difference for the specific factor. The results of the analysis are accordingly discussed. The significance level below 0.05 was used because this degree of significance has been commonly used by previous researchers in similar studies (Cheung et al. 2012; Osei-Kyei and Chan 2017c; Cheung 2009).

4.5.5.2.1 Mann-Whitney U Test on Economic and Financial Conditions Factors

As illustrated in Table 4.20, the Mann-Whitney U test results for "economic and financial conditions issues" indicate the P-values obtained for both groups (i.e., public and private) were higher than the fixed value ($P < 0.05$). This indicates that there were no statistically significant differences among the participants. Therefore, the null hypothesis was retained, and none of the factors was deleted from further analysis.

Table 4- 20: Mann-Whitney U test analysis for Economic and Financial Conditions

Economic and financial factors	N	**Public Sector**		**Private Sector**		**Mann - Whitney U Test**			
		Mean score (MS)	**Standard variation**	**Mean score (MS)**	**SD**	***U* value**	**Standard test statistics *Z* Score**	**Asymp. significance (*p*-value)**	**Effect of size**
Local banks' inability to provide long-term loans for PPP	168	4.041	0.97	4.196	0.80	0.06	0.150	0.057	0.15
Lack of access to finance for PPP project	168	3.639	1.17	3.679	0.95	0.57	0.045	0.572	0.05
Lack of matured local financial capital market for PPP	168	3.9028	0.95	3.8512	1.01	0.573	0.045	0.573	0.045
Unstable economic and financial conditions	168	3.7222	0.89	3.7083	0.95	0.868	0.013	0.868	0.013

4.5.5.2.2 Mann-Whitney U Test on Economic Viability of PPP Projects

As presented in Table 4.21, the Mann-Whitney U test results for "economic viability of PPP project issues " shows that the *P*-values obtained for both groups (i.e., public and private) were higher than the fixed value ($P < 0.05$) except for "private investors not able to recoup their investment within the concession period", as this had a significant value of 0.014, which was less than the fixed value ($P < 0.05$). The effect of size analysis also indicated that the effect was less than the predetermined value

of 0.5 (refer to 3.16.3.2). Although "private investors not recouping their investment within the concession period" is critical for any PPP private investor, however, because there was a statistically significant difference among the participants, the null hypothesis was rejected, and the factors were removed from the list of factors as previously indicated.

Table 4-21: Mann-Whitney U test analysis for the Economic Viability of PPP Projects

Economic viable project factors	**N**	**Public Sector**		**Private Sector**		**Mann - Whitney U Test**			
		MS	**Standard variation**	**MS**	**Standard variation**	***U* value**	***Z* Score**	**(*p* value)**	**Effect of size**
Lack of bankable projects	168	3.833	1.03	3.6771	1.14	3240.	1.138	0.466	0.056
Low traffic volume projection	168	3.486	1.02	3.5000	1.02	3415.	1.016	0.891	0.011
Lack of commercially viable PPP road projects to attract private investors	168	3.500	1.27	3.4583	1.25	3384.	1.247	0.811	0.018
Private investors not able to recoup their investment within the concession period	168	4.0000	0.87	3.5625	1.13	3389.00	1.131	****0.014	0.019

****** deleted from the list of factors

4.5.5.2.3 Mann-Whitney U Test on Political and policy-related Factors

The Mann-Whitney U test results for "political and policy-related factors" as indicated in Table 4.22 show that there were no significant differences in the perception of the participants (private and public) for all the factors under political and policy-related issues because the *p*-value obtained for both groups was more than the predetermined value ($P < 0.05$), indicating that there was no statistically significant difference among the participants. Therefore, the null hypothesis was retained, and none of the factors was deleted from further analysis.

Table 4-22: Mann-Whitney U test analysis for political and policy-related factors

Political and policy-related	N	Public Sector		Private Sector		Mann - Whitney U Test			
		MS	Standard variation	MS	Standard variation	*U* value	*Z* Score	(*p*-value)	Effect of size
Lack of suitable skills and experience of PPP professionals	168	3.444	1.20	3.177	1.26	3203.00	-0.840	0.195	0.100
Absence of clear institutional and PPP legal framework	168	3.681	1.09	3.720	0.86	3385.50	-0.236	0.813	0.018
Political instability	168	3.6389	0.98	3.6146	0.99	3398.50	-0.193	0.437	0.015
Risk of continuation of uncompleted PPP road projects by successive governments	168	3.8750	1.07	3.9688	0.96	3346.50	-0.370	0.813	0.029
Lack of government support for PPP road projects	168	3.2917	1.25	3.2604	1.15	3413.00	-0.142	0.887	0.011

4.5.5.2.4 Mann-Whitney U Test on Corruption-Related Factors

Table 4.23 details the results of the Mann-Whitney U test carried out at a prearranged significance (*p*-value) value of ($P < 0.05$). Again, the results indicate that values for all the factors were higher than the fixed value *p*-value. The results show that there was no statistically significant difference among the participants. Therefore, the null hypothesis was retained; thus, none of the factors was deleted.

Table 4-23: Mann-Whitney U test analysis for corruption-related factors.

Corruption-related	N	Public Sector		Private Sector		Mann - Whitney U Test			
		MS	Standard variation	MS	Standard variation	*U* value	*Z* Score	(*p* value)	Effect of size
Lack of transparency in bidding process	168	3.4444	1.20	3.3646	1.08	3253.00	-0.680	0.496	0.052
Lack of transparency in information disclosure	168	3.5556	0.99	3.4792	1.13	3335.00	-0.403	0.687	0.031

4.5.5.2.5 Mann-Whitney U test Public Support for PPP Road Projects

As presented in Table 4.24, the P-value obtained for "public opposition to the PPP road projects", "road users not ready to pay realistic tolls", and "road users using alternative roads rather than the toll roads" were 0.550, 0.466 and 0.824 respectively. The *p* values obtained were higher than the fixed value ($P < 0.05$). The results suggested that there was no statistically significant difference among the participants. Therefore, the null hypothesis was retained, and none of the factors was deleted from further analysis.

Table 4-24: Mann-Whitney U test analysis for public support for PPP road projects

Public-Support Related Factors	N	Public Sector		Private Sector		Mann-Whitney U Test			
		MS	Standard variation	MS	Standard variation	*U* value	*Z* Score	(*p* value)	Effect of size
Public opposition to the PPP road projects	168	2.7639	1.08	2.6667	1.03	3277.5	-0.598	0.550	0.046
Road users not ready to pay realistic tolls	168	3.8333	1.03	3.6771	1.14	3240.0	-0.728	0.466	0.056
Risk of road users using alternative roads rather than the toll roads	168	3.472	1.13	3.500	1.20	3393.5	-0.207	0.824	0.017

4.6 Findings from the Quantitative Analysis

As presented in Table 4.25, out of the 18 factors that were analysed, the majority of them (17) had a medium mean level value of more than "3" of the 5-point Likert scale of 1 = strongly disagree 2 = disagree, 3 = neither agrees nor disagree, 4 = agree, and 5 = strongly agree. This indicates that within the groups (private and public sector), the factors were considered important. Again, it was also found out that out of the 18 factors, only one had a significance value (p-value) less than the predetermined value of 0.05. Therefore, the factor "private investors not able to recoup their investment within the concession period" was removed from the list of factors. Thus, at the end of the analysis, 17 factors, as detailed in Table 4.25, were considered as challenges that prevent the private sector from investing in PPP road projects in Ghana.

Table 4-25: List of PPP challenges that emerged from the research findings

ID	PPP Challenges	Public Sector	Private Sector
		Mean	Mean
Economic and financial conditions			
1	Local banks' inability to provide long-term loans for PPP	4.042	4.196
2	Lack of access to finance for PPP projects	3.639	3.679
3	Lack of mature local financial capital market for PPP	3.903	3.851
4	Unstable economic and financial conditions	3.722	3.708
Economically viable projects			
1	Lack of bankable projects	3.833	3.677
2	Low traffic volume	3.486	3.500
3	Lack of commercially viable PPP road projects to attract private investors	3.500	3.458
Political and policy-related issues			
1	Lack of suitable skills and experience of PPP professionals	3.444	3.177
2	Absence of clear institutional and PPP legal framework	3.681	3.720
3	Political instability	3.639	3.615
5	Risk of continuation of uncompleted PPP road projects by successive governments	3.875	3.969
6	Lack of government support for PPP road projects	3.292	3.260
Corruption related			
1	Lack of transparency in the bidding process	3.444	3.365
2	Lack of transparency in information disclosure	3.556	3.479
Public support for PPP			
1	Public opposition to the PPP road projects	2.764	2.667
2	Road users not ready to pay realistic tolls	3.833	3.677
3	Road users using alternative roads rather than the toll roads	3.472	3.500

4.7 Chapter Summary

During the literature review, it was observed that the factors that prevent the private sector from investing in PPPs were a project and country-specific. In line with this, the global factors identified from the literature were contextualised through a qualitative and quantitative data collection method. Therefore, this chapter revealed how semi-structured interviews and survey questionnaires were used to explore the factors that prevent the private sector from investing in PPP road projects in Ghana from the Ghanaian perspective. The qualitative approach was based on ten semi-structured interviews. Purposive and snowballing sampling approaches were employed to identify these experts; they included directors, contract managers, project managers and PPP experts and others. The names of the respondents' identities were coded for ethical reasons.

The interview discussions were audio-recorded and later transcribed and translated verbatim. Before beginning data analysis, checks were conducted on all the interviews; the transcribed data were sent to the participants for verification and confirmation to ensure that the transcribed data reflected the opinions expressed by each of the participants during the face-to-face interviews. The findings from the interview were used to formulate the survey questions for the questionnaire (quantitative) phase of the study.

The quantitative data were collected through a self-administered, postal and email questionnaire; in total, 250 questionnaires were administered, of which 168 completed and useable responses (representing a response rate of 67%) were received and analysed. These were found to be suitable and adequate for the study. The questionnaire survey data were analysed using a combination of descriptive statistics, mean ranking values, frequencies, standard deviation, Kendall's coefficient of concordance (W) and Mann-Whitney U test (P) analysis. The data contained both the categorical and latent variables; therefore, a reliability test was conducted using Cronbach's Alpha, using SPSS software to check for the internal consistency of the data. The Cronbach's Alpha results indicate a Cronbach's Alpha value of 0.743, with 18 items.

Out of the 18 factors which were analysed, the majority of them (18) had a medium mean level value more than "3" of the 5-point Likert scale of 1 = strongly disagree 2 = disagree, 3 = neither agree nor

disagree, 4 = agree, and 5 = strongly agree. This was an indication that within the groups (private and public), the factors were considered important. Again, it was also found out that out of the 18 factors, only one had a significant (p-value) less than the predetermined value of 0.05. Therefore, the factor "private investors not able to recoup their investment within the concession period" was removed from the list of factors. Thus, at the end of the analysis, 17 factors were considered as a challenge that can prevent the private sector from investing in PPP road projects in Ghana. Based on these 17 factors, research objective No. 2 (i.e., explore the factors that can prevent the private sector from investing in PPP road projects from the Ghanaian perspective) was achieved. The next chapter discusses the findings from the data analysis.

CHAPTER 5: DISCUSSIONS OF RESEARCH FINDINGS

5.1 Chapter Introduction

The researcher began the study by reviewing pieces of literature that describes the general concept of PPPs in global settings. An understanding of how some developed and developing countries have used the PPP method in addressing their infrastructure challenges was gained. A semi-structured and a questionnaire were conducted. Two hundred and fifty questionnaires were self-administered, and through emails, 168 questionnaires were completed and returned, representing a response rate of approximately 67%. Descriptive statistics mean ranking values, frequencies, standard deviation, Kendall's coefficient of concordance (W) and Mann-Whitney U test (P) analysis were used to analyse the responses from the questionnaire surveys. A reliability test was conducted using SPSS software, which indicated a Cronbach's Alpha value of 0.743, which is higher than the predetermined Cronbach's Alpha value of 0.70. This value indicates the internal consistency and reliability of the survey response.

The chapter will revisit the research findings, the reviewed literature, and the data collection and analysis, and explore the implications. The discussion of the research findings takes into consideration the research questions and objectives, as presented in sections 1.6 and 1.7 and detailed in Table 5.1. This was to ensure that all the objectives are given due consideration.

Table 5-1: Research questions and objective and method adopted

Questions		Objectives	Method		
			Literature Review	**Interview**	**Survey**
1	What are the challenges associated with the public financing of road projects in Ghana?	Critically examine the existing knowledge on public-private partnerships (PPPs) to gain an understanding of PPPs, infrastructure financing, PPP project vehicles and drivers, and the success or failure of PPP projects. Understand the challenges associated with public finance of infrastructure	✓	×	×
2	What are the challenges preventing the private sector from investing in PPP road projects in Ghana?	Investigate the challenges preventing the private sector from investing in PPP road projects in Ghana	✓	✓	✓
3	What are the global best practices that can address the challenges identified in the study?	Explore the global best practices that can address the challenges identified from the study, and	✓	×	×
4	How can the challenges identified from the study be addressed to create the necessary enabling environment to attract private sector investment in PPP road projects in Ghana?	Develop and validate a best practice framework that can address the challenges identified from the study	✓	×	✓

5.2 Objective No.1 - Existing Knowledge of PPPs

As presented in Table 5.1, the purpose of this objective was to examine existing knowledge on PPPs, infrastructure financing and PPP project vehicles and drivers and the success or failure of PPP projects. Achieving this objective has led to the following findings:

- PPP method of finance infrastructure projects has gained considerable prominence as an alternative approach by governments in both developing and developed countries as a vehicle for public infrastructure and services delivery compared to the conventional procurement method (Osei-Kyei and Chan 2017a; Chan et al. 2009; Chou and Pramudawardhani 2015).

Apart from its ability to relieve governments of their financial problem, the perceived advantages of PPP procurement cover the provision of "value for money", efficiency and modernisation in public infrastructure and service system, and sustainability (Cheung et al. 2009; Chou and Pramudawardhani 2015).

- It was noticed that notwithstanding all the attributes, commitment, popularity, and benefits of PPPs, as a vehicle to attract private sector financing for infrastructure development, there is no consensus on the definition of PPPs. Many countries (developed and developing) have used PPPs for infrastructure (hard and soft) development in many sectors of their respective economies, such as education, healthcare, custodial transport infrastructure, public buildings, defence, IT facilities, and others. However, the drive to adopt the PPP concept as a vehicle for infrastructure development differs from country to country in both developed and developing countries. PPP adoption has mostly been dependent on the organisation, country, and institutions. Some PPP researchers are of the view that most developing countries accept the PPP approach as a condition on loan from international organisations (Osei Kyei et al. 2014). However, the reasons for adopting PPP depend on the objectives of the parties involved in the PPP agreement. APMG (2016) mentioned that some governments adopt PPP for a range of reasons: 1) to provide a financial mechanism for governments, 2) to offer project efficiency and effectiveness, and 3) to increase transparency and control corruption. Other motivations for adopting PPP pointed out by Osei Kyei et al. (2014) are to promote the quick delivery of public infrastructure and to reduce the government's financial burden and risk-sharing.

- As discussed in section 2.12, not all infrastructure projects can be procured using the PPP approach. For this reason, Grimsey and Lewis (2004) and Weber and Alfen (2010) mentioned four criteria that must be taken into account before any government decides to adopt either the PPP approach or the traditional method. The four criteria are the core service test, project viability test, affordability test, public interest test, and value for money test. PPPs are a means of attracting private sector investment for infrastructure development. However, some jurisdictions have defined specific sectors, or services within sectors, for which PPPs will not be used (Sharp 2005; World Bank 2014). Other sectors are exclusively for the government

and are not made accessible to the private sector through PPPs (World Bank, 2014). These are sometimes called ‘core’ services. Core services are those which involve direct delivery of community services to the public or the exercise of statutory power (Sharp, 2005). The core service test determines whether it is the government alone that can provide such services, in which case only the public sector is delegated to provide them. In other words, this is to determine if the services to be provided through PPP are “pure public goods” or just normal public goods.

- It was acknowledged from the in-depth literature review that traditionally; the financing of government has been responsible for the provision of public infrastructure. However, this position is changing because of financing constraint governments all over the world are facing, particularly developing countries. This has compelled governments to address the challenges confronting infrastructure financing, to accelerate infrastructure development and economic growth (Perera, 2017), create jobs (Ministry of Finance, 2019), raise the quality of infrastructure (Ullah *et al.*, 2016) and reduce inflation (HM Treasury, 2012). For many governments, it is adopting innovative means of financing public infrastructures through one of the oldest methods of infrastructure financing, such as project financing (Toriola-Coker 2018).

- It was noticed from the literature review that the two primary sources of raising funds by a for PPP project by any company are through debt or equity financing (Delmon 2016). As pointed out by Delmon (2016) and Yescombe (2010), debt may be in the form of loans or bonds, and equity may take the form of pure equity or capital shares, and quasi-equity products (junior or subordinated debt, mezzanine debt, and others); these are senior to the equity shares but subordinate to the (senior) debt or main debt.

- Debt financing refers to the borrowing of loans from companies, such as banks or financial institutions, to support a business’s operations, in this case, the financing of an infrastructure project. Debt may be in the form of loans or bonds. Private sector project finance debt is provided from two main sources: commercial banks and bond investors (Yescombe 2010;

APMG 2016). Commercial banks are the most commonly used source for project finance, as they lend to project companies for long-term for infrastructure development (IBRD 2017; Delmon 2016). Further, IBRD mentioned that lenders to PPP projects in developing countries might include multilateral and bilateral development banks and financial institutions, as well as institutional investors, such as pension funds and insurance companies.

5.3 Objective No 2 – Challenges for PPP Road Projects in Ghana

The second research objective of this study is to investigate the challenges preventing the private sector from investing in PPP road projects in Ghana. A combination of methods was employed to achieve this objective: a literature review, semi-structured interviews, and a survey questionnaire. Since the introduction of the PPP concept in Ghana, the road and highways sector has not received the necessary investment from the private sector through PPP. Therefore, it was vital to identify the challenges preventing the private sector from investing in PPP road projects in Ghana. Evidence from the reviewed literature indicates that certain challenges prevent the private sector from investing in PPPs. These challenges were generic, and therefore, they were validated through a semi-structured interview to contextualise them in the Ghanaian roads sector settings. The research findings confirm that 17 country- and road sector-specific challenges can prevent the private sector from investing in PPP road projects in Ghana. This section provides and discussed the research findings and where applicable, links the literature to the research outcome. Accordingly, the challenges are discussed in the following sections.

5.3.1 Lack of Bankable PPP Road Projects

Findings from the semi-structured interviews (see Table 4.3) indicate that a high percentage (60%) of the interviewees acknowledged “lack of bankable PPP projects” as a dominant issue which can impede PPP implementation in the Ghanaian roads sector. Similarly, the public and the private sector survey respondents highly ranked this factor. Findings from the research suggest that the lack of bankable PPP road projects is a critical issue that can affect the economic viability of PPP road projects and will not make PPP road projects attractive to private sector investors. As confirmed by Babatunde and Perera (2017), bankable projects prove the potential of a PPP project to the private

investors and a sign to indicate that the private investor would be able to recoup their financing investment before the concession agreement expires.

This finding is in line with De Marco and Mangano (2017), Zhu and Chua (2018), and Owolabi et al. (2020). They postulated that bankability is the ability of a project to raise sufficient finance, that is, enough to cover operating cash flows and to service the debt in terms of interest and debt repayment. Therefore, if a PPP project is not bankable, it will be very unusual for private investors to invest in that project. Owolabi et al. (2019) also acknowledged that a bankable PPP project attracts local and international investors and financiers. However, Leigland and Roberts (2007) are of the view that the problem of most developing countries, including Ghana, is not the lack of funding, as was thought previously, but the lack of packaged bankable PPP projects that will attract private inventors and financiers. This points to the need for governments to provide funding to assist in preparing bankable PPP road projects. From this context, Delmon (2016) emphasised that governments in developing countries need to support PPP project preparation with funding to prepare bankable PPP pipeline projects. From this line of argument, it can be concluded that to attract private sector investment in PPP road projects, the government of Ghana should support the roads sector in preparing pipelines of bankable PPP road projects that will encompass a robust financial, economic, fit-for-purpose technical solution and proper allocation of the associated risks (Delmon 2016).

5.3.2 Low Traffic Volume

It was acknowledged from the literature that the principal source of revenue for PPP projects that incorporate toll is mainly from traffic volume. Therefore, traffic fluctuation, which at times can occur in PPP road toll projects, directly affect the revenue streams, thus resulting in financial difficulties for the private partners and frequently prolonging the concession period for the PPP project (Domingues and Zlatkovic 2015). Given this finding, it was surprising that only 30% (see Table 4.3) of the interview respondents recognised that "low traffic volume" can affect the economic viability of PPP road projects, thereby preventing the private sector from investing in PPP road projects in Ghana. However, the findings from the 168 survey respondents indicate that both the public sector and the private sector ranked the factor as relevant based on their mean values (see Table 4.6), which were more than the median value of "3" as explained in the methodology chapter. For instance, respondents

from the private sector felt even more strongly regarding the importance of the factor and ranked it higher than the public sector.

The finding implies that both the private sector and the public sector survey respondents agreed that "low traffic volume" can influence the economic viability of PPP road projects in Ghana. The finding is not surprising, as low traffic volume has been the cause of failed PPP toll road projects in many jurisdictions. For example, in Vietnam, a PPP road toll projects commissioned in Ho Chi Minh City and Hanoi had an issue with their toll collection, caused by low traffic volume, which resulted in insufficient toll revenue to repay the loan (Phong et al. 2017). This finding conforms to the previous study by Pal and Gill (2014), who mentioned that low traffic volume is not a good sign for PPP road projects, mainly when it is user pays. Further, they claimed that low traffic volume affects project cost as well as project revenue. Hence, accurate traffic volume forecasting is a crucial input in the financial and economic appraisal of toll road projects. As recognised by Li and Hensher (2010), low traffic volume will not make PPP attractive to private investors, as low traffic demands for highways leads to less revenue from tolls, and less revenue from tolls means less recovery of investment by the private entity; therefore, no private entity will invest in PPP road projects with a low traffic volume. In line with this argument, it is clear that for PPP road projects to be economically viable and attract the needed private sector investment in Ghana, a sustainable traffic volume throughout the operational phase of the project is critical.

5.3.3 Lack of Commercially Viable PPP Road Projects to Attract Private Investors

As mentioned in section 2.12.2, commercially viable PPP road projects are those that provide adequate revenue to cover capital costs and operation and maintenance costs (Wentworth and Makokera 2015; Osei-Kyei and Chan 2017b). Findings from the interviews indicate that only 20% of the interviewees agreed that "lack of commercially viable PPP road projects to attract private investors" can affect the economic viability of the project and thereby prevent the private sector from investing in PPP road projects in Ghana. On the other hand, the 168 public and private sector participants who took part in the survey ranked the factor highly.

The finding is similar to that of previous studies by IBRD (2017), Calderón et al. (2018), Osei-Kyei and Chan (2017b), and Shendy et al. (2011), who acknowledged that projects which are likely to generate sufficient revenue to cover the project's cost would attract investors, as the primary objective of the private investor is to maximise profit. A report by the Work Bank on PPPs in six selected countries in Africa, including Ghana, concluded that the single most critical challenge confronting PPP implementation in Africa is the inability to demonstrate a commercially viable PPP project that will attract private investment (Shendy et al. 2011). Not all PPP road projects can be commercially viable on their own. Therefore, Ernest and Young (2012) suggested that PPP projects that are not commercially viable on their own require support from the government to make them commercially viable by paying for the viability gap fund (VGF), that is, if the project makes sense politically and meets the goals of the government. In addition to the government providing the necessary funding for VGF, there should be a significant tariff re-alignment to ensure the road toll charges meet the economic realities, as this issue can be a significant risk for the private sector (World Bank 2009). Levy (1996), argued that financial analysis of BOT must show adequate revenue projection that demonstrates financial viability for the entire life of the project for it to be attractive to the private sector.

5.3.4 Local Banks' Inability to Provide Long-Term Loans for PPPs

The local banks' capability to provide project financing is very critical for PPP project implementation (IBRD 2009). As cited by the Ghana Ministry of Finance (2019), having a functional financial system is critical to the functioning and development of any economy, and the role of the local banks is central to any financial system. In respect of PPP transactions, a project company raises finance for the project through a mixture of equity, which is provided mainly by the project company's shareholder, and debt provided by banks, or through bonds or other financial instruments (World Bank 2014). In most developing countries, particularly Ghana, the local commercial banks do not have the capacity to supply the type of loans needed for long-term infrastructure investment (Oppong et al. 2014). Findings from the analysis of the results (Table 4.3) show that 60% of the interviewees were of the view that "local banks' inability to provide long-term loans for PPP" was an issue for PPP road projects in Ghana. Similarly, respondents from the public and the private sector ranked the factor

highly (refer to Table. 4.5). The finding implied that the local banks in Ghana have neither the capacity nor the ability to provide a long-term loan for PPP road projects.

This finding is in accordance with a report by the World Bank, which indicated that local commercial banks in Africa, including Ghana, are small in size relative to the levels of financing required for large PPP infrastructure projects (Shendy et al. 2011). The report further indicated that the banks are not able to mobilise the required financing because a significantly large segment of the population has poor living conditions; therefore, they do not have sufficient financial resources that enable them to accumulate significant savings. In Ghana, the longest loan tenors are approximately five years, with only rare exceptions surpassing this tenor (Shendy et al. 2011). Taking the average PPP concession duration (25-30 years) into account, it is evident that the local commercial banks will not be able to raise such tenors from their deposits, which are of a short-term nature, for PPP road projects. However, Ghana can learn from the PPP financing arrangements of South Africa and Mozambique, where syndicated debt finance was sourced locally by ABSA, Nedcor, Standard Bank and First National Bank, the Development Bank of Southern Africa, and the Mines Employees and Officials Pension funds. The two governments (South African and Mozambique) provided a debt guarantee for the project. The Nigerian government also used a similar financing arrangement for the financing of the Lekki expressway in 2006. These two projects have their specific successes and failures; nonetheless, they serve as a model for Ghana in PPP funding road projects.

5.3.5 Lack of Access to Finance in the Market for PPP Projects

Access to finance for PPP projects was identified in the literature review (see section 2.17.4) as a challenge confronting PPP implementation. Findings from the semi-structured interviews revealed that 50% of the respondents acknowledged that "lack of access to financing for PPP projects in Ghana" was a critical challenge confronting PPP project financing in Ghana. However, findings from the survey indicate that both the public and the private sector participants who participated in the survey questionnaire ranked the factor as 'low'. PPP investors rely on access to markets and particularly access to a financial market to borrow for infrastructure development (Satar and John 2016). Therefore, the survey respondents ranking the factor 'low' does not mean that it is not an essential factor for successful implementation of PPP road projects in Ghana.

The finding is inconsistent with the previous study by Shendy et al. (2011), which indicated that access to the local currency and affordable long-term debt and the need for government support to provide the capital investment required to make a PPP transaction commercially viable is rare in Ghana. Nkechi and Thesis (2017) confirmed that access to finance is a challenge in Africa, while a survey sponsored by the International Finance Corporation (IFC), cited in Biau et al. (2008), indicated that three key challenges preventing their involvement in PPPs in Africa include the high cost of finance and the lack of access to finance. Chan et al. (2010a) and Osei-Kyei and Chan (2017b) opined that a financial market where the private investor can access finance at a lower cost is an incentive to private sector investors. As cited by APMG (2016), in countries where there is no sufficient availability of finance, PPPs may not work. In this regard, countries with access to finance may provide a favourable investment environment for private investors.

5.3.6 Immature Local Financial Capital Market for PPPs

As discussed in Chapter Two, a robust and accessible domestic capital market is an incentive for private sector investors who want to invest in PPPs. Findings from the in-depth semi-structured interviews (see Table 4.3) and the survey questionnaire analysis sector (see Table 4.5) reveal that both the public and the private sector respondents ranked the factor highly irrespective of their sectors. The higher ranking of the factor by both sectors is not surprising because the capital market for PPP in most developing countries, including Ghana, has not matured to a point where private investors can source significant capital for PPP projects, especially roads.

As cited in the previous study by Shendy et al. (2011), the financial capital markets in African countries, including Ghana, are underdeveloped, and this has been why it is difficult for PPP investors to invest in Africa. Osei-Kyei and Chan (2017b) highlighted that one of the most critical factors for PPP projects is the availability of a capital market for PPP investment. Given the local currency-based revenues of a PPP road project, either from toll revenue or the national budget, the ability to raise substantial capital, debt, and equity for PPP projects in local currency markets significantly alleviates the currency risk of a PPP project (World Bank 2009). Though international sources of financing for PPPs do offer some alternatives to local domestic sources, such sources cannot replace a robust local

financial and capital market. For this reason, a significant level of capital market development is needed in Ghana to make PPP road projects attractive to private investors. As emphasised by Ameyaw and Chan (2016), developing countries, including Ghana, need to pay attention to developing their domestic markets to enable borrowing for non-resource project financing, as PPPs often rely on the local capital market. In this regard, the government of Ghana supporting reforms in the domestic capital market includes the government and nongovernment bond markets, the equity market, and pension and insurance funds will help boost the financial capital market (Shendy et al. 2011).

5.3.7 Unstable Economic and Financial Conditions

Findings from the survey and the interviews indicate that the public and the private sector respondents considered "unstable economic and financial conditions" as an essential factor in PPP financial transactions. Unstable economic and financial conditions signify that there are excessive fluctuations in a macroeconomy. An unstable economic condition affects the interest rate, inflation and exchange rates. As mentioned in a study by Ahmadabadi and Heravi (2019b) and Osei-Kyei and Chan (2017a), the effect of unstable economic and financial conditions on PPP investments is that they make it difficult for private investors to forecast their investment returns accurately; also, because of the cost uncertainty, they increase the overall cost of projects to take account of the risk. As pointed out by Osei-Kyei and Chan 2015b), in the case of the Nigeria Lekki toll road project, which was the first privately financed toll road project in West Africa, the project presented a financial challenge because of the unstable exchange rate, which resulted in higher operational costs and then compelled the concessionaire to increase toll fee charges, which eventually affected the operation.

A stable macro-economy environment, where depreciation of the currency is stable, and interest rate and the rate of borrowing from the commercial banks are relatively low, will increase the attractiveness of the PPP market to private investors. However, in Africa, and particularly in Ghana, arguably, it will take a considerable time to achieve the stable economic and financial conditions that can attract the private sector to invest in PPP road projects due to the current conditions as compared to the developed nations where PPPs are mature. On the other hand, Osei-Kyei and Chan (2017a) indicated that a government could support PPP road projects through sovereign guarantees and other forms of guarantees to enable investors to secure the required funding from financial institutions;

indeed, this would help reduce the financing cost of PPP projects and attract private sector investment in PPP road projects in Ghana.

5.3.8 Inadequate PPP Skills and Knowledge of the Public Sector Officials

In most developing countries, like Ghana, the procurement approach for PPPs is relatively new. Therefore, the experience and knowledge base of public sector officials relative to PPP project implementation is limited. Cases of failed PPP projects have been attributed to the low-level expertise of public sector officials in managing PPP projects (Opawole et al. 2019; World Bank 2009; Kavishe 2018). Based on the mean value (see Table 4.9), the public and the private sector respondents irrespective of their sectors ranked "inadequate PPP skills and knowledge of the public sector" highly. From the semi-structured interview analysis (refer to Table 4.3), 50% of the respondents also perceived the factor as essential for successful PPP project implementation. The finding is in line with previous studies by Kavishe et al. (2018). Similarly, several studies have equally highlighted the issue of skills and knowledge as essential for the implementation of PPP projects (Osei-Kyei et al. 2017; Yang et al. 2017; Opawole et al. 2019; Chileshe and Kikwasi 2014; Ameyaw and Chan 2016).

This finding is deep-rooted in the study of the United Nations for Economic and Social Commission for Asia and the Pacific (2012), cited in Wibowo and Alfen (2015), which highlighted the benefits of having well-trained and experienced public sector officials, with benefits, ranging from knowing where difficult issues are most likely to arise and the ability to apply experience and knowledge to address the identified problems. The PPP practise in Ghana's roads sector is not mature. Thus, there is a lack of knowledge and experience among public sector officials. Previous research conducted by Osei-Kyei et al. (2017) into PPP in Ghana underlined that many local practitioners, particularly public sector officials, do not have adequate knowledge and experience in PPP project management, and this lack is affecting PPP preparation and implementation. As stressed by Smith (2016), many developing countries are experiencing difficulties in training and retaining the high-quality staff necessary to deliver PPP projects. This prevents the public sector from benefitting from the improved infrastructure and services that could be provided, which adversely affects the economies. For this reason, Osei-Kyei et al. (2017) alluded to the need to organise seminars and short courses on PPP negotiations, identification, assessment, and preparation (appraisal), as well as risk management of

PPP projects for public sector officials and practitioners. They further suggested that there is a need for international exposure, that is, international tours and exchange programs to expose public sector officials to the international best practices of PPP.

5.3.9 The Non-Existence of Institutional and Legal Framework for PPPs

The non-existence of institutional and legal framework for the implementation of PPPs leads to conflicting agendas across government agencies. It prevents PPP transactions from developing in a timely, efficient, and consistent manner. As identified in the literature review, private sector investors are comfortable investing in a country where a clear legal and institutional framework exists (Shendy et al. 2011).

Findings from the survey and interviews revealed that both the private and the public sector participants ranked the "non-existence of institutional and legal framework for PPP highly". It implies that irrespective of their sectors, they considered this to be a critical issue for the implementation of PPP road projects in Ghana. This is supported by many previous researchers. For example, Osei-Kyei and Chan (2017a) and Ismail (2013) identified a legal and regulatory framework as a precursor for successful PPP project implementation. Despite the importance of a clear legal framework for PPP implementation, there is no legal framework for the implementation of PPP projects in Ghana. The PPP Bill is yet to be enacted as an Act of Parliament. Although the government of Ghana as introduced a policy guideline for PPP practice (MoFEP 2011), undeniably, this is not enough to attract private investment in PPP road projects because of the high rate of political influence in public transactions in developing countries (Ho 2006). A report by the World Bank stated that a "strong institutional and legal framework signals a government's long-term commitment to its PPP programme to the market as well as institutionalising best practice and procedures" (Shendy et al. 2011, p. 55). This suggests that having legal framework backing for PPP practice in Ghana will boost private sector confidence to invest in PPP road projects as many PPP projects developed in the absence of a PPP framework have gone wrong(APMG 2016). Additionally, without a PPP framework, officials are at risk of making poor decisions.

5.3.10 Political Instability

Political stability is identified in the literature as one of the CSFs for PPP implementations (Zhang 2017). Findings from the semi-structured interview data analysis (see Table 4.3) indicate that 40% of the respondents held the view that political instability is the critical factor that can prevent the private sector from investing in PPP road projects in Ghana.

Similarly, political instability was ranked fourth by the respondents from both the public and the private sector. However, the low ranking of the factor does not suggest that the factor is not essential for PPP road project implementation. As observed in Osei-Kyei and Chan (2017b) and Adeoye (2019) several developing countries, including in SSA, have political and electoral systems that are not stable and effective and, therefore, reduce PPP investments.

Further, Osei-Kyei and Chan (2017b) indicated that political stability denotes the absence of political violence and the existence of governmental longevity and a legitimate constitution. Ghana is considered one of the most stable countries in West Africa since it transitioned to multi-party democracy in 1992. However, in order to attract the necessary investment in PPP road projects, more needs to be done in respect of politically related violence during and after presidential and parliamentary elections. As asserted by Alteneiji et al. (2019), typically, build-operate and transfer concession periods range from 20 to 40 years; therefore, political stability must be maintained for a relatively long time to avert the main concerns of most PPP investors.

Private investors are often motivated to invest in a country where there is adequate political stability. Political instability, on the other hand, usually brings about changes in government policies (Goyol 2018). It also leads to higher inflation (Aisen and Veiga 2010) and results in an uncertain political-economic environment (Aisen and Veiga 2010). The consequential effect of "political instability' is not a good indicator for private investors who want to invest in PPP road projects in any country. No investor, whether local or international, would be comfortable investing in a country where there is no political stability (Prasad 2018). Indeed, political instability has led to the failure of some initiated PPP projects in some developing countries and may have deterred investors from investing in future projects. For this reason, Ghana, being new to PPP implementation, should learn a lesson from other

developing countries where PPP has been successfully implemented and should maintain a stable political atmosphere that will send a good signal to private sector investors.

5.3.11 Non-Continuation of Uncompleted PPP Road Projects by Successive Governments

Concession periods for PPP road projects usually far exceed the term of a government (APMG 2016). After a change of government, a new administration may not have any interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change of government (Osei-Kyei and Chan 2017b). In line with this argument, both the private and the public sector respondents ranked "non-continuation of uncompleted PPP road projects by successive governments" highly.

Ghana has seen a situation where road projects procured by the previous government had been terminated, cancelled, or abandoned by successive governments for various reasons. Therefore, it is unsurprising that both the private sector and the public sector respondents ranked the factor highly, irrespective of their sectors. This finding agrees with Demuijnck and Ngnodjom (2011), who opined that in some developing countries, specific PPP projects often initiated by governments receive firm political opposition throughout the implementation of the project, and eventually, the projects are cancelled or terminated by successive governments. In this regard, incumbent governments in developing countries must use proper measures and strategies to gain adequate support from opposition parties towards the implementation of PPP projects (Osei-Kyei and Chan (2017b).

As cited by Loxley (2013) in the case of the Lekki toll road in Nigeria, the toll generated adverse reactions from the public. The Nigerian experience suggests that PPPs road projects can be politically sensitive. As recommended by Osei-Kyei and Chan (2017b), gaining enough support from all political parties would prevent the unnecessary abrogation of PPP contracts when a different political party is in power. Additionally, legislation to ensure political consensus on the use of a PPP model for some selected roads, as in the case of Nigeria, where Presidential Executive Order No. 007 of 2019 has been issued to clarify some roads as "eligible roads" for PPP (Federal Republic of Nigeria 2019) could be a positive step for Ghana. Zhu and Chua (2018) asserted that it is imperative to include

a stringent termination clause in the concession agreement and PPP framework that would compensate the private investor in case of termination or cancellation of the agreement.

5.3.12 Lack of Political and Government Support for PPP Road Projects

Findings from the semi-structured interviews (see Table 4.3) indicate that a low percentage (30%) of the interviewees regarded "lack of political and government support for PPP road projects" as a critical issue for PPP implementation in the roads sector of Ghana. Similarly, the public and the private sector respondents ranked the factor as low. The low ranking by both the public sector and the private sector respondents is are not consistent with the recent research by Ismail and Ahmad (2018), Alteneiji et al. 2019) and Kavishe et al. (2018), where political support for PPP was highly ranked.

According to Babatunde et al. (2016), government support for PPP is imperative to trigger private sector confidence. Fundamentally, political acceptance and support for PPPs are essential to attract investors' interest in PPP markets in developing countries. As emphasised by Osei-Kyei and Chan (2015b), political leaders, including opposition parties, need to exhibit unyielding will and commitment towards private sector participation in public infrastructure delivery. Li et al. (2005a) asserted that PPPs as a concept could not be disassociated from government support, as it is the host country who has to formulate policies and laws to make it useful; therefore, there is a direct relationship with the commitment, will, and support of government backing and acceptability for PPPs, which not only tends to attract investors but also to reduce the political risks associated with PPP projects (Ke et al. 2010). Musawa et al. (2017) and WBG (2015) felt that government support for the private sector in the form of guarantees, grants, service payments, subsidies, and tax rebates, will articulate the level of government commitment to PPP.

In Ghana, the concept of PPPs has not received the needed political support and government commitment, which is why since 2011, the legal framework to back the PPP policy is still not in place. As indicated by Osei-Kyei and Chan (2015), private investors will invest in a country where there is clear government support for PPPs. Thus, the government communicating its commitment and support for PPP road projects will increase the attractiveness of the PPP market to private investors.

5.3.13 Public Opposition to PPP Road Projects

Findings from the semi-structured interviews and the survey indicate that "public opposition to PPP road projects" was ranked low by the interview participants and the survey respondents. This result was unexpected, as the ranking is contrary to the findings in early studies. For instance, Liu and Wilkinson (2011) identified public opposition as one of the significant reasons for the failure of PPP and, as such, was a high political risk. Ameyaw and Chan (2015) argued that public resistance is pertinent in PPPs, mainly where it is a user-pay. As cited by Casady et al. (2020), there have been multiple and highly publicised cases of public opposition to the private provision of infrastructure and large numbers of contracts, which has led to the cancellation or renegotiation of PPP projects in some international jurisdictions.

Oluwaseun and Odun (2014) emphasised that some of the challenges confronting PPP implementation in Africa have also faced strong ideological opposition due to the fear of job losses among workers and opposition from politicians and government officials due to an expected loss of substantial power patronage derived from the current procurement process.

In a developing country like Ghana, civil society organisations and trade unions can oppose the implementation of PPPs, especially in the roads sector, because of the ideological differences and also the fear of public servants losing their jobs. Additionally, as the income levels of the majority of Ghanaians are low, they may oppose to PPP road projects because of their unwillingness to pay road tolls, as in the case of the Nigeria Lekki-Epe Expressway Toll Road Concession where road users opposed the increase in road tolls (Toriola-Coker 2018).

5.3.14 Road Users not Willing to Pay Realistic Tolls

In some developing countries, the ability and willingness of users to pay for a better quality infrastructure is a limitation to PPP implementation (World Bank 2009). In other words, public affordability is critical for the economic viability of user-pay PPP (Zhang 2004). As indicated from the findings (refer to Table 4.3), 50% of the interview respondents were of the view that "road users not willing to paying realistic tolls" can be a challenge to the implementation of PPP in the roads sector of Ghana. Equally, both the public and the private sector respondents ranked the factor highly,

with a mean value of 3.83 and 3.68, respectively. This implies that road users not being willing to pay realistic tolls can be a hindrance to the successful implementation of PPP in the roads sector of Ghana. Previous studies by Osei-Kyei and Chan (2017c) confirmed high end-user charges as a major factor hindering the success of PPP road projects in developing countries, including Ghana. Meanwhile, Gomez et al. (2017) reaffirmed that road users paying realistic tolls is one of the critical drivers to achieve a successful PPP road toll project.

APMG (2016) acknowledged that road-user willingness to pay is critical to the sustainability of PPP road projects. When road-users are not willing to pay a realistic toll fee, they will use an alternative road, and that will have a negative effect on the revenue streams of the project. High user charges often result in numerous public protests and unrest, which may compel the host government to provide subsidies (Osei-Kyei and Chan 2017c). Therefore, the scope of long-term service charges must be within the acceptable levels of road users. If users pay appropriate tolls, it will enhance the economic viability of a PPP project.

5.3.15 Road Users Using Alternative Roads rather than the Toll Roads

According to the World Bank (2009), in a PPP toll road project, where the principal source of revenue is from user-pays, "alternative roads" are a significant commercial risk. Commercial risks are perhaps the most considerable risks faced by the private parties when their remuneration directly or indirectly originates from road users. Findings from the interviews (see Table 4.3) indicate that 30% of the interview participants perceived "road users using alternative roads rather than the toll roads" as an issue that could affect the economic viability of PPP road projects in Ghana. On the contrary, irrespective of the sector**,** the 168 survey respondents from the public sector and the private sector ranked the factor highly.

Findings from the study indicate that "road users using alternative roads rather than the toll roads" can be a challenge to the implementation of PPP in the roads sector in Ghana. This finding is consistent with Osei-Kyei and Chan's (2017c) finding that road users using alternative roads reduces the economic benefit of PPP road projects. As confirmed by Gomez et al. (2017), the World Bank (2009), and Nikitas et al. (2018b), traffic volume is a crucial input into the financial and economic

viability and sustainability of toll road projects. However, it is a requirement under the United Nation's rule on PPP, for government to provide a toll-free alternative route for the public to give them an opportunity to choose between the available road provided by the government through their social responsibility and the private provision driven by profit motives (Asian Development Bank 2000). Additionally, roads and highways are public goods; therefore, it is the government's responsibility to undertake the development of road infrastructure and make it available to all classes of society in an equitable manner. But, allowing alternative routes on the same corridor (roads or other transport modes) can also have a stimulating effect and jeopardising the financial viability of a well-designed PPP road project (World Bank 2009). It is, therefore, pertinent to take into consideration the effect of road users' using an alternative route during the appraisal phase of the PPP project preparation.

5.3.16 Lack of Transparency in the Bidding Process

To attract private sector investment in the development of PPP road projects, the process of selecting contractors must be transparent, and the tender rules must be fair, with limited exceptions for direct negotiation. As opined by Delmon (2016), there must also be rules for rejecting or implementing unsolicited proposals and adequate guidelines for challenging the project award. Private investors are often reluctant to invest in PPPs out of fear of an unfair bidding and procurement process (Shendy et al. 2011).

Findings from the semi-structured interviews (see Table 4.3) indicate that 70% of the interview respondents were of the view that "lack of transparency and a competitive bidding process" is a critical factor that can prevent the private sector from investing in PPP road projects. However, the 168 public and private sector participants who were respondents in the survey, ranked the factor as low. The low ranking by the survey respondents is not consistent with previous research by Ameyaw et al. (2015) and Chan and Ameyaw (2013). They discovered that the act of corruption is one of the significant challenges affecting PPP implementation in Ghana. Ameyaw et al. (2015) confirmed that systematic corruption and unethical behaviour prevails among the Ghanaian public sector officials, contractors, and construction professionals during the bid evaluation, tendering, and contract implementation stages of a construction contract. Opawole et al. (2019) affirmed that lack of

transparency and competitive bidding process are distinct factors that are significant to public sector operations generally in most developing countries. Opawole et al. (2019) reaffirmed that corruption is pervasive in government procurement.

As mentioned by Biau (2008), without a proper procurement framework which encapsulates appropriate information disclosure provisions, transparency in procurement will suffer, and this may reduce the interest of the private investors to invest in PPP road projects. Biau further indicated that fear of an unfair bidding and procurement process means private actors are often reluctant to engage in PPPs. Transparent upstream competition, before concessions are even attributed, is essential for the excellent health of PPPs. Therefore, it is imperative that procurements should ensure procedural fairness and should provide stakeholders with all the necessary guarantees and information. As the roads sector takes the form of a natural monopoly, a downstream risk of private investment is also that the power of this monopoly may be abused because of corrupt actions. Thus, it is a responsibility of the government to establish appropriate procedures to deter, detect, and sanction corruption; this would improve both public and private sector integrity and accountability. This line of argument suggests that the entrenchment of transparency in the procurement process is a precursor to improving PPP project performance to enhance the general public's confidence in public sector officials and to attract private investors' interest in PPP road projects in Ghana as opined by several researchers (Cruz and Marques 2012; Loxley 2013; Osei-Kyei et al. 2017).

5.3.17 Lack of Transparency in Information Disclosure

Findings from the semi-structured interview participants (see Table 4.3) indicated that "lack of transparency in information disclosure" was perceived as a critical factor that can prevent the private sector from investing in PPP road projects in Ghana. However, the public sector and the private sector ranked this factor first and second, with a mean value of 3.56 and 3.49 (see Table 4.8), respectively. Information disclosure can aid the PPP projects in achieving value for money (World Bank 2015). However, without a proper framework that incorporates appropriate information disclosure provisions, transparency will deteriorate, and this will affect private sector interest in PPP road projects (Biau 2008; Musawa et al. 2017).

According to the World Bank (2015), a key challenge facing the disclosure of information in some countries appears to be the reluctance of public bodies to share information in the absence of a clear mandate or framework for proactive disclosure as well as the lack of clarity on disclosure specific to PPPs. They further indicated that there is also a feeling among government officials that their decisions, as well as being "advisory", may be exposed to public scrutiny. APMG (2016) asserted that information disclosure is critical for PPP implementation; therefore, there must be a sound framework which should encourage proactive information disclosure of both the project contract and the project performance.

5.4 Objective No.3 - Best Practices for PPP Projects Implementation

The third objective of the research explores best practices for successful PPP project implementation and its application in the context of the Ghanaian roads sector. In the absence of a robust and bankable pipeline of PPP road projects in Ghana, as highlighted in Chapter One, the best practices were identified from the global best practices (refer to section 2.21). These consist of lessons learnt from cases of PPP road projects and other relevant documents. In all, seventeen "best practices" which were considered applicable to address the challenges that emerged from the study were derived from the results. A similar approach was employed by Osei-Kyei and Chan (2018). The following sections bring together the best practices identified from the reviewed literature to address the identified challenges from the research findings.

5.4.1 Best Practices Proposed to Address "Lack of Bankable PPP Projects."

The research finding identified "lack of bankable PPP projects" as an issue that can prevent the private sector from investing in PPP road project in Ghana's roads sector. As was observed from the literature review, Ghana lacks well-packaged bankable road projects. A well-packaged PPP road project that will attract private inventors and financers hinges on PPP project preparation (Leigland and Roberts 2007).

To address the issue of "lack of bankable PPP road projects", the government of Ghana should sufficiently support PPP projects with funds to help the procuring authority in preparing a bankable

PPP road project, that is backed by current engineering studies, well thought out feasibility studies that include cost-benefit analysis, social-economic issues, financial appraisal, fit-for-purpose technical solutions, and environmental and administrative factors (Leigland and Roberts 2007; World Bank 2014).

5.4.2 Best Practices Proposed to Address "Low Traffic Volume."

Observations from the research findings indicate that "low traffic volume' affects the revenue streams of PPP toll road projects and, as a result, leads to financial difficulties for the private partners and prolongs the concession period for the PPP project (Domingues and Zlatkovic 2015). The study also acknowledged that low traffic volume would not make PPP attractive to private investors, as low traffic demand for a highway leads to reduced toll revenues, and reduced toll revenues mean less recovery of investment by the private entity (Hensher 2010; Pal and Gill 2024).

This study proposes that the government of Ghana develop a policy for the utilisation of space/sites for hotels, restaurants, leisure facilities, industrial parks, and tourist attractions along the proposed PPP road corridor; this could increase the commercial activities on the road and generate traffic volume (World Bank 2017; APMG 2016). The structure of the toll charges has implications for the project's cash flow; hence, flexibility should be embedded in the contract for possible adjustment as the situation demands to enhance the project viability (Kwak et al. 2009).

5.4.3 Best Practices Proposed to Address "Lack of Commercially Viable PPP Road Projects."

As acknowledged from the literature review, "commercially viable PPP road projects" provide adequate revenue to cover capital costs and operation and maintenance costs (Wentworth and Makokera 2015; Osei-Kyei and Chan 2017b). Therefore, projects which are likely to generate adequate revenue to cover the project's costs attract investors, as the primary objective of the private sector is to maximise profit (Calderón et al. 2018; Shendy et al. 2011).

Findings from the study imply that there is a "lack of commercially viable PPP road pipeline projects in Ghana to attract private investors". As cited by the World Bank, the single most critical challenge confronting PPP implementation in Africa, including in Ghana, is the inability to demonstrate a commercially viable PPP project to attract private investment (Shendy et al. 2011). A PPPs need the financial resources of the private sector. Therefore, if the PPP road project cannot provide financial returns for the level of risk incurred by the private sector, then it will not be commercially viable. This suggests that the PPP road project must be able to generate returns to the investor and enable investors to raise debt from lenders, while also meeting the requirement of affordability to the public sector;

To make the project commercially viable, Ernst & Young (2012) suggest that the government provide direct financial support that will make the PPP project commercial feasible. The government support may be grants made during the Construction Phase (sometimes called co-financing) or complementary service payments made over the operational phase of the contract (a hybrid payment mechanism). For example, in India, The Cabinet Committee on Economic Affairs established a Viability Gap Fund (VGF) program for financial support to Public-Private Partnerships in Infrastructure. The primary objective of India's VGF program was to attract more private investment in infrastructure by making PPP projects financially viable. The program has been successful. Therefore, Ghana can learn from India's experience and implement it in Ghana's road sector.

5.4.4 Best Practices Proposed to Address "Local Banks' Inability to Provide Long-Term Loans".

From the research findings, it was apparent that "local banks' inability to provide long-term loans for PPP road projects" can prevent the private sector from investing in such projects. As indicated in the literature review, PPPs require long-term funding (between 25-30 years); therefore, a robust local commercial bank with the capacity to provide a long-term loan to private investors will increase the attractiveness of the Ghanaian PPP market to local and international investors (Shendy et al. 2011). Additionally, it was observed from the literature review that the size of the local commercial banks in Ghana is small relative to the levels of financing required for large infrastructure projects (Shendy et al. 2011; Effah Ameyaw and Chan 2013). Again, the longest loan tenors in Ghana is approximately five years; this is not in favour of PPP road projects, which require a longer loan term.

To attend to the issue of "local banks' inability to provide long-term loans for PPP road projects, the government of Ghana should embark on banking sector reforms that will allow private investors to acquire a long-term loan for PPP road projects. Additionally, Ghana can learn a lesson from the South Africa-Mozambique partnership and the Nigerian PPP financing arrangement, where syndicated debt finance was sourced locally for the South Africa to Mozambique expressway and for the Nigeria Lekki expressway.

5.4.5 Best Practices Proposed to address "Lack of Access to Finance for PPP Projects."

As pustulated by Nkechi and Thesis (2017), access to finance is a challenge in Africa. According to Chan et al. (2010a) and Osei-Kyei and Chan (2017b), access to a financial market is an incentive for private sector investors. As cited by APMG (2016), in countries where there is insufficient availability of finance, PPPs may not work. In this regard, countries with access to finance may be a favourable investment environment for private investors.

To address this issue, the government should consider financial backing to the private sector; this will be helpful and increase the investors' access to finance. A novel and particularly sustainable sources of financing could also come in the form of private equity finance, such as pension funds into PPP projects (HM Treasury 2012). This will give infrastructure's potential to match long-term provision assets; these funds are steadily gaining interest in the sector (Biau et al. 2008; IMF 2004). Another novel method that the government of Ghana can explore is by allowing insurance companies to invest in bonds issued by companies involved in PPP road projects (IMF 2004).

5.4.6 Best Practices Proposed to Address the "Immature Local Financial Capital Market for PPPs."

A robust domestic capital market which is accessible is an incentive to private sector investors. As mentioned in the previous study by Shendy et al. (2011), the financial capital market in Africa, including Ghana, is underdeveloped, and this is why it has been difficult for PPP investors. A PPP road project is a local currency-based project because of the revenue stream, either from toll revenues

or other user charges or from the national budget. Therefore, the ability to raise substantial capital, debt, and equity for PPP projects in local currency markets will significantly alleviate the currency risk of a PPP road project (World Bank 2009).

The research findings indicate that "immature local financial capital market for PPP", where a private investor cannot raise substantial capital, debt, and equity for PPP road projects can impede the private sector from investing in PPP road projects. To address the issue of the immature local financial capital market for PPPs, Ameyaw and Chan (2016) emphasised that developing countries, including Ghana, need to pay attention to developing their domestic markets to enable borrowing for non-resource project financing, as PPPs often rely on the local capital market. Given the above, the government of Ghana should support structural reforms to enhance local sources of infrastructure financing by developing the local capital market, which includes the government and non-government bond markets, the equity market, and pension and insurance funds; this will help by boosting the financial capital market (Shendy et al. 2011).

5.4.7 Best Practices Proposed to address "Unstable Economic and Financial Conditions."

Unstable economic and financial conditions signify that there are excessive fluctuations in a macroeconomy. These fluctuations affect the interest rate, inflation, and exchange rates. The effect of unstable economic and financial conditions on PPP investments is that they make it difficult for private investors to forecast their investment returns accurately; also, because of the cost uncertainty, they increase the overall cost of projects to take care of the risk (Ahmadabadi and Heravi 2019b; Osei-Kyei and Chan 2017a).

Findings from the study indicate that the "unstable economic condition" of a host country can deter the private sector from investing in PPP road projects. To address this issue, the government can support PPP road projects by providing a sovereign guarantee and debt guarantees to enable the private investors to secure the required funding from financial institutions (Osei-Kyei and Chan 2017a).

5.4.8 Best Practices Proposed to Address "Inadequate PPP Skills and Knowledge of Public Sector Officials."

PPP projects in some jurisdictions have failed because of a lack of skills and knowledge by public sector officials (Opawole et al. 2019; World Bank 2009; Kavishe 2018). A report by the World Bank also highlights the criticality of training public officials to manage PPPs (Smith 2016). Smith (2016) further mentioned that training could be crucial to a PPP transaction. Findings from the research show that lack of knowledge and appropriate PPP skills can stall and delay a PPP road project; therefore, "inadequate PPP skills and knowledge of public sector officials" is not a motivator for PPP investors.

To address the issue of "inadequate PPP skills and knowledge of public sector officials", Osei-Kyei et al. (2017) suggest that government organising seminars and short courses on PPP project negotiations, identification, assessment and preparation, (appraisal), and risk management for public sector officials and practitioners will go a long way to equip the capabilities and skill of public officials in PPP implementation. They further suggested the need for international exposure by arranging international tours and exchange programs to expose public sector officials to the international best practices of PPP. As indicated by European PPP Expertise Centre (2014), if the public sector does not frequently develop PPP projects or do not have a PPP experience, it is unlikely to have the required range of competencies available in-house. Therefore, the required skills need to be regularly refreshed to capitalize on recent experience, developments in market standards, and innovations. This proposal will directly help to solve this issue through practical employee training on PPP negotiation, project preparation, and management issues. Additionally, there should be a policy to retain competent and knowledgeable public sector officials.

5.4.9 Best Practices Proposed to Address "Non-Existence of Institutional and PPP Legal Framework."

A clear legal framework is essential for PPP implementation. However, there is no legal framework for PPP practice in Ghana. As mentioned in the literature review chapter, private investors respond favourably to simple and clear institutional and legal arrangements where processes and procedures on how to engage with the public sector are well defined. They want to be sure that their investments

will be protected. Therefore, they are comfortable investing in a country where there is a clear legal and institutional framework (Shendy et al. 2011).

The research findings revealed that the "non-existence of institutional and PPP legal framework" in Ghana is an issue that can discourage private sector investment in PPP road projects. To effectively address this issue, the government of Ghana should provide a favourable institutional and legal framework for PPP implementation. Enacting a PPP bill will publicly communicate the government's commitment to and support for PPP to the private investors. It will let the market know-how government project will be developed, and how bids will be assessed.

5.4.10 Best Practices Proposed to Address "Political Instability."

Political stability is identified in the literature as one of the CFSs for PPP implementation (Zhang 2017). As mentioned by Osei-Kyei and Chan (2017b) and Adeoye (2019), several developing countries, including SSA, have a political and electoral system which is not stable and this, in effect, slows PPP investments. The research findings indicate that political instability can prevent private sector investors from investing in PPP road projects in Ghana.

Osei-Kyei and Chan (207b) asserted that political stability denotes the absence of political violence and the existence of governmental longevity and a legitimate constitution. Ghana is considered as one of the more stable countries in West African since it transitioned to multi-party democracy in 1992. However, there has been some politically related violence during and after presidential and parliamentary elections. As asserted by Alteneiji et al. (2019), typically, build-operate and transfer concession periods range from 20 to 40 years; therefore, political stability must be maintained for a relatively long time to avert the main concerns of most PPP investors.

To resolve the issue of political violence, which, if not effectively checked, can lead to political instability, the government of Ghana should communicate its intention to protect the investors and their investment in the event of political instability during the project implementation and ensure political stability; this can be part of the legal framework. Additionally, law enforcement agencies should enforce the law concerning violence during and after presidential and political elections.

5.4.11 Best Practices Proposed to Address the "Successive government abandoning PPP Project ."

Concession periods for PPP road projects usually far exceed the term of a government (APMG 2016). After a change in government, a new administration may not have any interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change of government (Osei-Kyei and Chan 2017b). Investors are not motivated to invest in a country where the majority of political parties have not accepted PPP policy. The literature suggests that there have been situations in Ghana where road projects initiated by previous governments had been terminated, cancelled, or abandoned by successive governments for various reasons (Damoah et al. 2018). Again, in the absence of limited and continued public support, a project may be cancelled by the next elected government. For example, in 2015 a proposed toll road in Melbourne, Australia was cancelled when a new state government was elected, costing the government $250 million in fees for planning, preliminary works and other fees.

Therefore, to address the issue, incumbent governments need to secure support from opposition parties towards the implementation of PPP projects to prevent the unnecessary abrogation of PPP contracts when a different political party is in position (Demuijnck and Ngnodjom 2011; Osei-Kyei and Chan 2017b). Additionally, consultation and engagement of opposition political parties are crucial when considering legislation that will ensure political consensus on the use of the PPP model for some selected roads, as in the case of Nigeria, where Presidential Executive Order No. 007 of 2019 has been issued to clarify some road "Eligible Roads" for PPP (Federal Republic of Nigeria [FRN] 2019). As mentioned by APMG (2016), the government will always reserve the right to terminate a contract early on the bases of public interest. However, APMG further indicated that in the event of early termination, it is essential that the contract provides the private partner with significant protection in the case of termination for convenience (unilateral termination).

5.4.12 Best Practices Proposed to address the "Lack of Political and Government Support for PPP Road Projects."

Government acceptance of and support for PPP projects are essential to attract investors' interest in PPP markets. As postulated by Babatunde et al. (2016), a host government given its support to a PPP project triggers private sector confidence. Findings from the research pointed out that "lack of political and government support for PPP road projects in Ghana" can be a deterrent to the private sector investors who want to invest in the PPP road project.

To address the issue of the "lack of political and government support for PPP road projects", Musawa et al. (2017) and WBG (2015) suggested that government support to the private investors in the form of guarantees, grants, service payment, subsidies, and tax exemptions and the government creating the enabling environment for PPP will send a positive signal to the private investors.

5.4.13 Best Practices Proposed to Address "Public Opposition and Resistance to the PPP Road Projects."

As discussed in Chapter Two, public opposition and resistance have been identified as one of the significant reasons for PPP failure, particularly, user-pays toll roads (Wilkinson 2011). As populated by Casady et al. (2020), there have been multiple and highly publicised cases of public opposition to the private provision of infrastructure and large numbers of contract, which has led to the cancellation or renegotiations of PPP projects in some international jurisdictions. In the absence of limited and continued public support, a project may be cancelled by the next elected government. For instance, in 2015 a proposed toll road in Melbourne, Australia was cancelled when the new state government was elected. If there are public demonstrations, labour union action or public boycotts, the project may suffer from delay.

The research findings indicate that "public opposition and resistance to the PPP road projects" can be a source of worry to private sector investment and, as a result, the private investor may not invest in PPP road projects. PPPs involve various stakeholders with different interests; thus, the attitude of each stakeholder could influence the output of the PPP road project. For example, a new water filtration plant proposed in Canada was cancelled after public protests, a South African toll road was delayed, and a public parking project was interrupted in Brazil. Therefore, the PPP framework should

include a policy on stakeholders' engagement (APMG 2016). The framework should include how to provide information to the key stakeholders and to invite feedback before formal opposition is developed. For instance, the project sponsors of the Alandur Sewerage Project in India ensured early involvement of the public through surveys and citizens' committees and targeted outreach explaining the project costs, benefits, and tariffs. As a result, the project proceeded smoothly. The India example suggests that government officials seeking the buy-in and commitment of all stakeholders during the project implementation can help to avoid public opposition of the PPP project (Wibowo and Alfen (2014).

5.4.14 Best Practices Proposed to address "Road Users not Willing to Pay Realistic tolls."

As mentioned by APMG (2016), road-user willingness to pay is critical to the sustainability of PPP road toll projects. The research findings indicate that the road users not being willing to pay a realistic road toll could have a negative influence on the economic viability of a PPP road project, and that will not make the project viable.

In such a situation, APMG (2016) proposed that the individual affordability and willingness to pay should be tested during the project preparation stage to ensure the tolls are affordable for the population. Additionally, a socio-economic appraisal should also be conducted. If the user charge is high, the government should provide subsidies to make the project economically viable (Osei-Kyei and Chan 2017c; OECD 2013 Musawa et al. 2017).

5.4.15 Best Practices Proposed to Address "Road users Using Alternative Roads rather than the Toll Roads."

Findings from the study indicate that "road users using alternative roads rather than the toll roads" can be a challenge to the implementation of PPP in Ghana's roads sector. Traffic volume is a crucial input into the financial and economic viability and sustainability of toll road projects (Gomez et al. 2017; World Bank 2009; Nikitas et al. 2018b).

To address the issue of "road users using alternative roads rather than the toll roads", the road toll should be affordable for the road users (as discussed already). Alternative routes should not be created

on the same corridor (roads or other transport modes), as they can have a stimulating effect and jeopardise the financial viability of a well-designed PPP road project (World Bank 2009). The decision to allow a free alternative route for road-users should be made after a sound economic analysis. All alternative roads and prospective alternative roads should be made known to the potential bidders during the procurement stage. Besides, the road toll should be affordable by the users. At the same time, alternative routes should be provided for the road users who either cannot afford the toll charges or are not interested in the toll road. The public must be provided with the opportunity to choose between the available road provided by governments through their social responsibility and the private provision driven by profit motives.

5.4.16 Best Practices Proposed to address the "Lack of Transparency and Competitive Bidding Process."

Ameyaw et al. (2015) suggested that corruption and unethical behaviour prevails among Ghanaian public sector officials, contractors, and construction professionals during the bid evaluation, tendering, and contract implementation stages of a construction contract. To attract private sector investment in PPP road projects, the process of selecting contractors must be transparent, and the tender rules must be fair, with limited exceptions for direct negotiation. Findings from the research indicate that "lack of transparency and of a competitive bidding process" can prevent the private sector investor from investing in PPP road projects, as private investors are often reluctant to invest in PPPs due to concerns about an unfair bidding and procurement process (Shendy et al. 2011).

According to APMG (2016), if the contract is designed in a way that is not acceptable to the private sector and its lenders, the private sector may not participate in the procurement process. Therefore, the government awarding agencies should ensure a fair, competitive and transparent procurement process by following procurement protocols. There should also be a procurement framework or update the exiting framework to guide the PPP procurement process, protect the public-private sector interest, avoid corruption, and improve the efficiency in the process because of the complexity in PPP procurement.

5.4.17 Best Practices Proposed to Address "Lack of Transparency in Information Disclosure."

Findings from the research indicate that "lack of transparency in information disclosure" can be an issue for the private sector investors who want to invest in PPP road projects, and as such, can prevent them from investing in PPP road projects.

To address the issue of "lack of transparency in information disclosure", the World Bank (2015) and APMG (2016) proposed a comprehensive information disclosure framework that incorporates appropriate information disclosure provisions to serve as a blueprint on how to disclose contractual information to the public and the private sector investors.

5.5 Section Conclusion

Based on the discussion from section 5.4.1 to 5.4.17, seventeen best practices proposed to address the challenges that emerged from the research findings are listed in Table 5.2.

Table 5- 2: Summary of best practices for PPP road projects

No	Proposed best practice	Reference
1	Prepare a bankable PPP road project	Section 5.4.1
2	Increase the commercial activities along the road the corridor	Section 5.4.2
3	Government to provide viability gap funding (VGF).	Section 5.4.3
4	Banking sector reform	Section 5.4.4
5	Government to give financial backing to the private sector	Section 5.4.5
6	Develop the local capital market	Section 5.4.6
7	Government to provide support for private investors in the form of guarantees.	Section 5.4.7
8	Train and retain skilled and knowledgeable public officials.	Section 5.4.8
9	Government to provide a favourable legal and institutional framework for PPPs	Section 5.4.9
10	Government to ensure political stability	Section 5.4.10
11	Consultation and engagement of opposition political parties. The PPP framework including a policy on stakeholders engagement	Section 5.4.11
12	Government to provide support for PPPs by creating an enabling environment.	Section 5.4.12
13	Government engaging all stakeholder for their support and commitment	Section 5.4.13
14	Road tolls should be affordable for road users. Government to subsidise where possible	Section 5.4.14
15	Alternative routes should not be created on the same corridor. Prospective alternative roads should be made known to the bidders.	Section 5.4.15
16	Ensure fair and competitive transparent procurement process by following procurement protocols.	Section 5.4.16
17	Information disclosure framework should be provided that incorporates appropriate information disclosure provisions.	Section 5.4.17

5.6 Chapter Summary

This chapter provided an introduction to the discussion of the findings from the study. The discussion focused on each of the objectives as outlined in the introduction chapter (Section 1.6). Outlining the challenges that prevent the private sector from investing in road projects as identified from the review of the literature and confirmed during the survey was also an essential aspect of this chapter. It was,

however, noticed from the discussion of the research findings that both the public sector and the private sector participants and respondents widely agreed that the 17 challenges identified from the studies could prevent the private sector from investing in PPP road projects in Ghana. However, best practice factors that were also identified from the review of the literature and the lessons learnt from other PPP road projects were considered applicable to address the identified challenges from the study, and these were also extensively discussed in this chapter. The ability to identify the challenges preventing the private sector from investing in PPP road projects and best practices from the review of the literature proved useful in achieving the research objectives two and three. The identification of best practices to address the challenges from the study led to the design and development of a best practice PPP framework, which is the last objective of the study.

CHAPTER 6: FRAMEWORK DEVELOPMENT AND VALIDATION

6.1 Chapter Introduction

This chapter focuses on the main objective of this research, which is to "develop a best practice PPP framework for Ghana's roads sector". The initial conceptual framework, as shown in Figure 2.5, stems from the literature review in Chapter 2. Based on the empirical results and findings from this study, the researcher presents the development best practice framework for the implementation of PPP in Ghana's roads sector. The researcher is of the view that addressing the identified challenges that prevent the private sector from investing in PPP road projects will enhance the attractiveness of PPP to private investors to invest in PPP road projects in Ghana. The best practice framework emerged from findings drawn from the global practices, detailed in the literature. This section presents the framework process; it also discusses the PPP process cycle and further incorporates the research findings into the PPP process cycle.

6.2 The Proposed Framework Process and Format

The development of the framework took into consideration the PPP project life cycle approach. The process involved customising the design to address the vital stages that need careful attention throughout the life cycle of the project concerning the challenges that emerged from the research findings. Earlier researchers have used the same method. For instance, Osei-Kyei and Chan (2018a) used a similar approach to develop a framework for the Ghana construction industry. At the same time, Kavishe et al. (2018) also used an identical method to develop a model for the Tanzanian housing sector. Finally, Cheung (2009) adopted the same approach to develop a best practice framework for PPP implementation in Hong Kong. The method used by Osei-Kyei and Chan (2018) and Kavishe et al. (2018) was adopted as a point of reference because Osei-Kyei and Chan's (2018) work was within the Ghanaian setting while Kavishe et al.'s (2018) approach was for the Tanzania Housing Sector, a country with similar socio-economic conditions. Since the best practice framework is for Ghana's roads sector, it was essential to consider the best practices relative to the Ghana PPP process cycle as presented in Figure 6.1, which includes inception stage, procurement stage,

construction stage and operation, maintenance and transfer stage. The stages are further explained in the subsequent sections

The best practice framework seeks to propose a tailored-made solution to address the challenges preventing the private sector from investing in PPP road project in Ghana. The framework will act as a blueprint for PPP road projects in Ghana and other countries with similar conditions. For this reason, the researcher was of the view that the framework must be informative. Thus, considering the structure and the aim of the framework, the final best practice framework was created in a tabular format. The tabular form is consistent with the framework developed by earlier PPP researches, like Cheung (2009) Osei-Kyei and Chan (2018) and Kavishe et al. (2018).

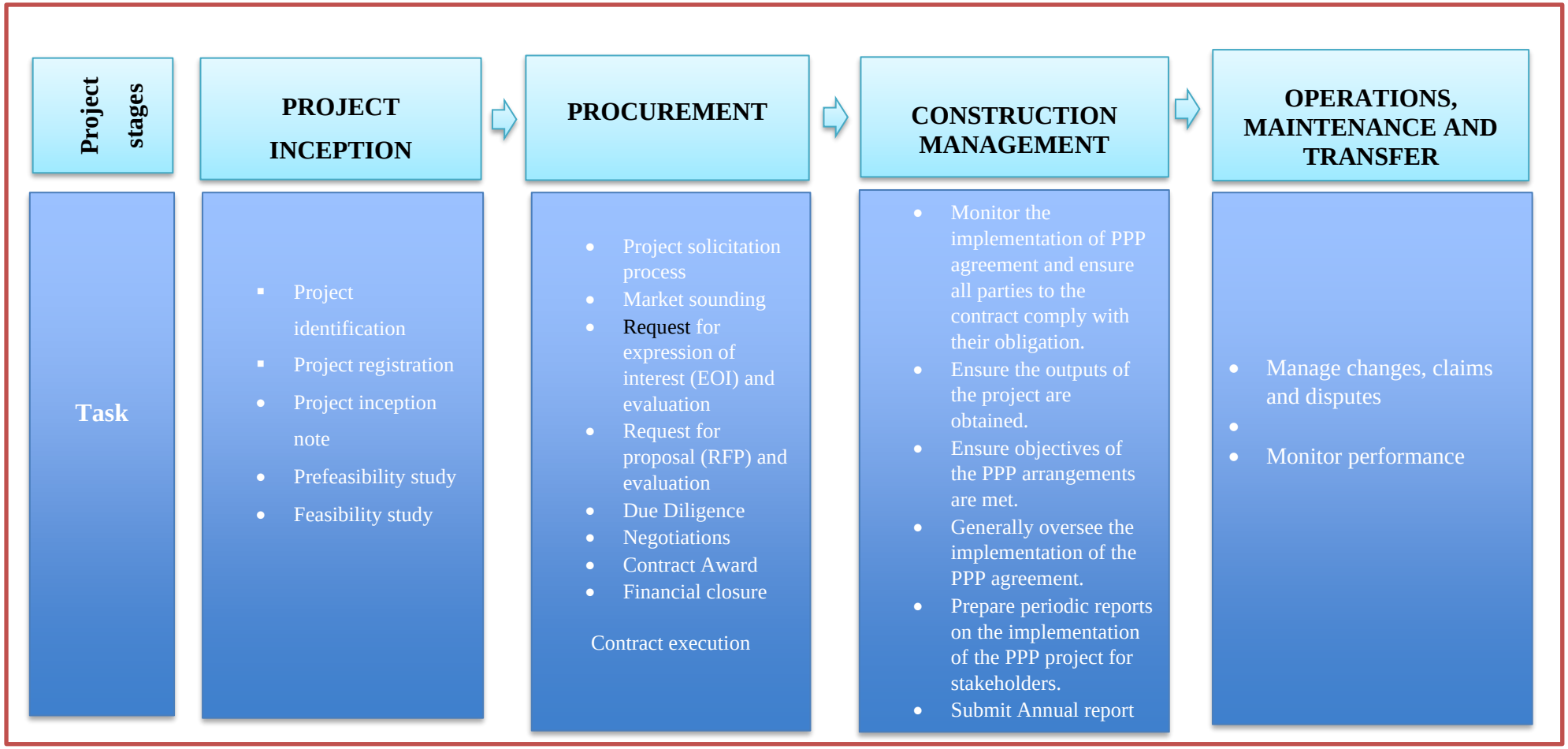


Figure 6- 1: Ghana PPP project cycle

6.2.1 Inception Phase

Activities at this stage include 1) project identification, 2) project registration, 3) preparation of project inception notes, 4) pre-feasibility study, and 5) feasibility study by the contracting authorities. In Ghana, for a project to be qualified as a PPP project, it must first be identified from the National Infrastructure Plan (NIP), National Public Investment Plan, and National Development Plan and must be set out in the sector policy document of the specific sector responsible, in this case, the Roads and Highways Ministry. In a situation where the project is being initiated by the Metropolitan, Municipal, and District Assembly (MMDA), it must be the current District Development Plan prepared by the MMDA or Assemblies within whose jurisdiction the project is to be undertaken (MoFep 2013).

Once the project has been properly identified and pre-defined, the contracting authority (CA) must inform MOFEP-PID of the expertise within that institution to proceed with the project, and the CA must also appoint a project officer (PO) from within or outside the institution to manage the PPP implementation. This must include the development of a staffing plan and the identification of any potential needs for advisors to support the pre-feasibility and feasibility studies. It should also include budget estimates and a funding plan for hiring any external expertise that may be needed. The pre-feasibility and full feasibility studies are also undertaken at this stage. The essence of the pre-feasibility and full feasibility studies is to examine the technical and financial anticipated value for money to be achieved if the PPP option is taken and to provide a detailed estimate of the viability gap. The environmental and social aspects of the proposed project are also examined at this stage, and finally, the capacity of the institution to procure, implement, manage, enforce, monitor, and report on the PPP is also evaluated.

6.2.2 Procurement Phase

The procurement stage involves several activities, as follows. 1) Market sounding is carried out; that is, the main parameters of the project are presented to selected potential investors for questions and comments. 2) A request is made for EOI and evaluation; at this stage, an advertisement is produced for interested parties to submit EOI through a suitable medium, including newspapers and government websites. The EOIs are evaluated, and shortlisted entities are invited to submit a proposal (RFP). 3) Due diligence is carried out, which involves conducting legal, environmental, financial, and all other

actions related to the due diligence in the interest of the project. 4) The award of contract and financial close closely follow the negotiation process. It is after the financial close and execution of contracts that the consortium can begin construction. Competitive tendering and transparency are the control method for this phase. Hence, unsuccessful bidders should be informed of why the winner was chosen in preference to them. As asserted by Zhang and Jia (2010, p. 518), effective cooperation among the parties could be achieved through exercising procedural control.

6.2.3 Construction Phase

This stage includes the day-to-day implementation of the contract. In Ghana, it is at this stage that the implementing agency, through the project management unit (PMU) undertakes the following activities: 1) monitor the implementation of PPP agreement and ensure all parties to the contract comply with their obligation; 2) ensure the outputs of the project are obtained; 3) ensure objectives of the PPP arrangements are met; 4) generally, oversee the implementation of the PPP agreement. 5) prepare periodic reports on the implementation of the PPP project for stakeholders, and 6) submit an annual report. This is a crucial stage that needs close monitoring to ensure that the project is implemented in accordance with the terms and conditions of the concession agreement/contract.

6.2.4 Operation, Maintenance and Transfer Phase

In some countries, the procuring authority or the government only authorises the commencement of operations once construction is completed, and the works are commissioned. When the contract is of a user-pays type, the SPV will be allowed to start charging users (with some projects involving upgrades to existing transport infrastructure, charges to users may occur during construction). When the contract is of a government-pays type, the SPV will be allowed to start invoicing the procuring authority at the frequency established in the contract (for example, monthly) and according to the payment mechanism defined in the contract.

In some concession contracts, the SPV assumes the maintenance risk and ensures the asset, in this context, the road, is in the appropriate condition during the entire life of the contract before the transfer to the client. This will require some investments to be made (renewals or reinvestments, also referred to sometimes as “major maintenance” or “life-cycle costs”).

6.3 Incorporating the Research Findings into the PPP Life Cycle Process

The PPP process presented in sections 6.2.1 – 6.2.4 described the stages and activities that must be performed at each stage for the successful implementation of PPP projects in Ghana. Therefore, this section demonstrates the best practices and actions that must be taken to address the challenges identified by the study. By integrating the challenges, the best practices, and the actions identified from the study, a best practice framework to address the challenges that can prevent private investors from investing in PPP road projects in Ghana can be achieved.

The challenges, the best practices, and the actions which form part of the best practice framework emerged from the research findings from a review of both the international and the local literature and a questionnaire survey. For each step of the process, the government of Ghana and the road agencies are presented with a list of challenges, best practices, and actions that need to be implemented to address each of the challenges identified. Tables 6.1 to 6.4 present the integrated challenges, best practice, rationale, and activities (long and short term) for each step of the PPP life cycle. For example, Table 1 demonstrates that there are 15 challenges and best practices for step 1 of the process "inception stage". The first challenge item for step 1 is "road users not willing to pay realistic road tolls" (section 5.3.14), and the first best practice item is "road toll should be affordable for the road users" (Section 5.4.14). These items are listed within the Table under no specific order. Similarly, the same applies to the other tables.

Table 6- 1: Initial Best Practice Framework

No	Challenges	Best Practice	Rationale	Proposed solutions/Actions		Project Stage
				Long-term at the policy level	Specific action, short term at the project level	
1	Road users not willing to pay realistic road toll	Test for willingness and affordability to pay realistic road tolls.	Viability of user pay PPP road projects depend on payment of realistic road tolls. Therefore, government may grant a concession to a private investor to charge road users for using the road at the operation stage. In a situation where willingness to pay a realistic road toll is a problem for the road users, government may support by filling in the viability gap by providing Viability Gap Funding (VGF) or subsidizing to keep the price of the toll charges to a level socially and politically acceptable for the population.	Government must develop a policy on Viability Gap Funding (VGF) and implemented same to support PPP road projects where users are not able to pay realistic road toll	Assess the individual affordability and willingness to pay realistic road toll.	S1
2	Public opposition to PPP road projects	Address public concern and perception	PPPs involve various stakeholders with different interests; thus, the attitude of each stakeholder could have an influence on the output of the PPP road project. Therefore, commitment of all stakeholders should be sought during the project implementation.	N/A	Sensitization the public of the benefits of using PPP model to develop our roads	S3 and S4
3	Road users using alternative roads	Address the issue of alternative roads	Traffic volume is a crucial input into the financial, economic viability and sustainability of toll road projects. Hence, road users using an alternative road could reduce the traffic volumes and consequently affect the revenue streams. However, road is a public infrastructure and therefore there must be an alternative road for those who are financially challenged.	Government should decide if alternative "free" roads should be made available to road users along the toll road corridor.	Decision to allow a free alternative route shall only be made after a sound economic analysis. All alternative roads and propose alternative roads should be listed in the Request for Proposal (RFP)	S1 and S4
4	Lack of adequate PPP skills and expertise	Training and retaining competent and experienced staff.	Many PPP project failures have been as a result of poor identification, assessment and preparation (appraisal) of the project, poor structuring and poor management of the tender process. For this reason, experienced advisors are highly recommended for appraising, preparing, structuring and supporting the tender process.	Government must provide a budget allocation for training (locally and internationally) of some selected public sector workers and develop policy on continues professional development (CPD) of staff and how to retain staffs.	Select public officers or firms with requisite experience and knowledge to manage PPP implementation. Train and retain skilled public officials to allow for a common baseline for PPP knowledge and best practices.	S1 S2, S3 and S4

Table 6- 2: Initial Best Practice Framework Cont.

No	Challenges	Best Practice	Rationale	Proposed solutions/Actions		Project Stage
				Long-term at the policy level	Specific action, short term at the project level	
5	Political instability	Ensure a stable political environment	No investor, whether local or international, will be comfortable to invest in a country which is not politically stable. Political instability has led to the failure of some initiated PPP projects in some developing countries and may have deterred investors from investing in future PPP projects. However, a stable political environment attracts adequate private sector to invest in the road sector.	Government must develop a policy/law that will protect investors and their investment in the event of political instability during the project implementation.	Such policy or law must be clear in the RFP and in the concession agreement	S1 and S3
6	Lack of continuity of PPP road project by successive government.	Strong political consensus on the use of the PPP model.	Concession periods for PPP road projects usually far exceed the term of a government. After a change in government, a new administration may not have an interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change of government.	Legislation to ensure a political consensus on the use of the PPP model for some selected roads Legislation to ensure continuity of the PPP project by successive government	Select roads for PPP from the legislated list.	S1, S3 and S4
7	Lack of government commitment and support for PPP road project	Government commitment and support for PPP road project	Investors will invest in a country where there is clear government support for PPPs. Thus, government communicating its commitment and support for PPP road projects will increase the attractiveness of the PPP market to private investors.	Government must develop a policy and provide clear guidelines, procedures and statement on supports for PPP road projects. Government	Government support must be clear in the RFP	S1
8	Absence of clear institutional and PPP legal framework	Good and favourable institutional and legal framework	The private investors respond favourably to simple and clear institutional arrangements where processes and procedures on how to engage with the public sector are spelt out. Establishing a clear PPP framework publicly communicates the government's commitment to PPP's. It also assures investors of fair and speedy resolution of disputes should any arise.	Government must develop a favourable institutional and legal framework that will set out rules, mechanisms, and procedures on how PPP should be implementation	Implement PPP road project in accordance with the institutional and legal framework	S1

Table 6- 3: Initial Best Practice Framework Cont.

No	Challenges	Best Practice	Rationale	Proposed solutions/Actions		Project Stage
				Long-term at the policy level	Specific action, short term at the project level	
9	Lack of commercially viable PPP projects	Commercial PPP road projects	Commercially viable road projects are those that provide adequate revenue from project sources to cover capital costs, operation and maintenance cost. Private investors will invest in PPP road project only when they can recoup their investments within the agreed concession period.	Provide viability Gap Funding (VGF) to increase the commercial viability of PPP road projects. Viability Gap funding must be made known to the Ministry of finance early for Cabinet decision before the budget reading to allow the government to make an allocation in the national budget for Viability Gap	Do not launch PPP projects unless there is strong evidence that the project is commercially and financially viable.	S1
10	Low traffic volumes	Ensure traffic volumes support PPP road project	The volume of traffic is critical to the sustainability of PPP road toll projects. Hence, tolled road traffic demand forecasting is a crucial input in the financial and economic appraisal of toll road projects.	Policy for the utilization of space/sites for hotels, restaurants leisure facilities, industrial parks and tourist attractions along the proposed PPP roads. This could increase the commercial activities on the road and also generate traffic volumes on the road.	Modelling traffic on complex road networks and understanding its impact on the viability of the PPP road project, particularly when alternative routes exist.	S1
11	Local banks not capable to provide long-term finance for PPP road projects.	Local banks granting long-term loans for PPP road project.	PPP requires long term funding (between 25-30 years). Strong local commercial banks that can provide a long-term loan to private investors will increase the attractiveness of the PPP market to local and international investors. In countries where there is no sufficient availability of finance and capacity to lend for the long term, for example, more than 10-year terms), PPPs may not work. Additionally, the size of local commercial banks is small relative to the significant funding required for PPP road projects.	Government should introduce reforms and policies that will address the short-term loan tenure of the commercial banks. This will help the commercial bank to grant long-term loans for PPP road projects. Govermnet to develop a policy that will encourage the local banks to provide syndicated loans to private investors for PPP road projects.	PPP road projects must not be so large that they exceed the size of the financial market.	S1
12	Lack of strong local capital market	Develop strong domestic capital market	PPP funding is mostly from debt, equity and bonds; therefore, a strong domestic capital market will enable the private investors to borrow money for PPP road projects from the local capital markets.	Governments must introduce structural reforms and see to the development of a strong local capital market.	N/A	S1

Table 6- 4: Initial Best Practice Framework Cont.

No	Challenges	Best Practice	Rationale	Proposed solutions/Actions		Project Stage
				Long-term at the policy level	Specific action, short term at the project level	
13	Lack of access to finance for PPP.	Develop the local financing market for PPP.	Government supplementing the private sector with financial support will increase the attractiveness of the PPP market to the private investors	Government must introduce reforms and policies that will ensure the development of the local capital market to support the private sectors in financing PPP road projects. Government must consider using part of the Pension Funds in supporting PPP road project financing by reviewing the law governing the Fund	NA	S1
14	Unstable macro-economic and financial conditions	Ensure stable macroeconomic and financial conditions	A good and stable macro-economic environment where the currency is stable, interest rate and the rate of borrowing from the commercial banks is relatively low will increase the attractiveness of the PPP market to the private investors.	Government must introduce a sound policy and reforms that will ensure macro-economy stability	N/A	S1
15	Lack of strong PPP local market	Create a condition that will lead to the emergence of strong local market for PPP	Investors prefer to invest in a market that has a recognizable pipeline project rather than a small number of isolated projects. The presence of pipeline is attractive to investors	Government through the relevant agencies should develop a pipeline of infrastructure project based on National Infrastructure Master Plan	Ensure PPP road project are selected inline from the Infrastructure Master Plan	SI
16	Lack of transparency in the bidding process	Ensure a competitive and transparent procurement process	Private investors are often reluctant to invest in PPPs out of fear of an unfair bidding and procurement process. Without a proper procurement framework which encapsulates appropriate information disclosure provisions, transparency will suffer, and this may affect the interest of the private investors to invest in PPP road project.	Procurement framework should include transparencies clauses	Ensure fair and competitive transparent procurement process by following procurement protocols	S2
17	Lack of transparency in information disclosure	Transparency in information sharing	Without a proper framework that incorporates the appropriate information disclosure provisions, transparency will deteriorate, and this will affect private sector interest in PPP road projects.	Include information disclosure clauses must form part of the PPP legal and institutional framework. Government must develop PPP information disclosure framework and set out clear procedures on how to disclose relevant information to the general public relative to PPP projects	For purposes transparency and accountability, all relevant information relative to the PPP project must be made available to the general public	S1 and S2

6.3.1 Validation and Refinement of the Initial Best Practice Framework

The initial best practice framework was developed from the findings from the literature, semi-structured interviews and the questionnaire survey. To validate the framework for its relevance and applicability in real life practice, a validation questionnaire was designed and sent out to nine (9) PPP experts in Ghana for validation. The validation process helped to ascertain the usefulness of the proposed best practice framework in addressing the identified challenges. It was also to validate whether the framework if implemented, could help in attracting private sector investments in PPP road projects in Ghana. This section presents the findings of the validation for the best practice framework developed in this research.

6.3.2 Design of the Validation Questionnaire Survey

In a bid to validate the best practice framework, a questionnaire survey was conducted. The justification for adopting a questionnaire survey was based on the fact that a similar validation process was employed by Cheung (2009) and Osei-Kyei and Chan (2018a). The portion of the framework which was evaluated includes 1) relevance of the challenges identified, 2) usefulness of the best practice, 3) usefulness of the proposed actions, 4) appropriateness of the challenges and best practices within each PPP process cycle, and 5) the extent to which the best practice framework if implemented, could help in attracting private sector investments in PPP road projects in Ghana. The validation questionnaire consists of three sections. The first section presented to the participants the aim of the validation. The second section solicited the background information of the participants. The final section presented instructions for answering the questions. At the end of the exercise, the respondents were asked to rate their question based on a 5-point Likert scale (1 - 5).

6.3.3 Selection of Validation Respondents

There were three main criteria which were considered for selecting the survey respondents for this validation process. Firstly, the respondents needed to have more than 5 years of experience/knowledge in PPPs. Secondly, the respondents needed to have a sufficient amount of knowledge about road projects in Ghana. Lastly, the survey respondents must not have contributed to the development of the best practice framework in this research study. A total of nine responses were collected; the details of the respondents are shown in Table 6.5. From the table, it is noticeable that

all nine experts possess adequate PPP experience in Ghana. Additionally, all the experts are in senior positions in their respective organisations

Table 6- 5: Details of framework validation participants

ID	Position	Organisation	Sector	Experience
P 01	Project Manager	Private	Consultancy- Roads	7 years
P 02	Contract Manager	Public	Road	8 years
P 03	Deputy Director – Procurement	Public	Road	6 years
P 04	Procurement Specialist	Private	Road	10 years
P 05	Director - PPP	Public	Roads	8 years
P 06	Senior Project Manager	Private	Consultancy	7 years
P 07	Senior Procurement Officer	Public	Consultancy	10 years
P08	Procurement Expert	Private	Consultancy	12 years
P09	Principal Consultant	Private	Consultant	9 years

6.3.4 Results of the Validation

Table 6.6 describes the results which emerged from the validation questionnaire survey, which was conducted with the selected respondents stated in paragraph 6.6.3. The respondents were requested to rank the five aspects of the framework according to a Likert scale of 1 to 5, 1=poor, 2=average, 3=good/satisfactory, 4= very good, and 5= Excellent (Osei-Kyei and Chan 2018a). A score above "3" would represent good or satisfactory for that aspect.

Table 6- 6: Framework validation results

Aspects of Validated	Respondent and Response									Mean
	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	
Relevance of the challenges identified	4	5	5	4	5	5	3	4	4	**4.33**
Useful of the best practice	4	4	4	5	4	4	5	3	5	**4.22**
Comprehensiveness of the proposed solution	4	2	5	4	4	5	4	3	4	**3.89**
Appropriateness of the challenges and best practices within each PPP process cycle	5	4	4	4	4	5	3	4	3	**4.00**
The extent to which the best practice framework, if implemented, can help in attracting private sector investments in PPP road projects in Ghana	4	4	4	5	4	5	4	4	3	**4.11**

From the results, all the aspects were rated above "3". The results obtained from the validation are as follows: "relevance of the challenges identified", ranked 1st with a mean score of 4.33 (very good); "useful of the best practice", ranked 2nd with an average score of 4.22 (very good); "extent to which the best practice framework, if implemented, could help in attracting private sector investments in PPP road projects in Ghana" ranked 3rd with a score of 4.11 (very good); "appropriateness of the challenges and best practices within each PPP process cycle" ranked 4th with a mean score of 4.00 (very good); and finally, "comprehensiveness of the proposed solution" ranked lowest with a mean score of 3.89 (good).

6.3.5 Refined and Final Framework

From the validated results, "relevance of the challenges from the findings" was highly rated, and the lowest rated by the experts was "comprehensiveness of the proposed solution". Generally, the overall feedback from the participants on the best practice framework for PPP projects was positive in terms of its relevance, usefulness, appropriateness, and intent. Nevertheless, going through additional comments, some of the experts provided some suggestions on how to improve the best practice framework. For instance, some suggested that "lack of continuity of PPP road project by the successive government should also be included in the procurement phase of the PPP process cycle, as a successive government who are not in favour of the project could truncate the procurement process. Hitherto, the lack of continuity of PPP road project by a successive government was not included in the list of challenges in the procurement phase.

Additionally, it was also observed form the comment that the column, titled "project stage" should be removed from the table. Accordingly, the initial proposed framework was then refined to reflect these valuable and vital suggestions from the experts, leading to the development of the final best practice framework, as shown in Table 6.7 to 6.13. Besides the best practice framework being in a tabular format, it was also presented in a diagram format, as shown in Figures 6.2 to 6.5.

The difference between the conceptual framework and the final best practice framework is that the factors used for the conceptual framework were the global factors from the comprehensive literature review. The challenges and the best practice identified from the literature review, presented in Table 2.2 to 2.5, were for the general construction industry. Therefore, the global factors were contextualised in the Ghanaian road sector through a qualitative and quantitative data collection method, which was statistically analysed.

After the factors were rigorously analysed, 17 road sector-specific challenges and best practices were established from the list of factors and were subsequently used as a basis for the development of the best practice framework. The empirical results and findings from this study were integrated into the PPP project cycle. The final best practice framework comprises PPP challenges, best practices, rationale and how the challenges can be addressed from the policy and from the project level. The best practice framework also includes guidance on how the private investor can manage investment risk. The final best practice framework is distinct from the conceptual framework as it contains an issue that governments should step-by-step address throughout the PPP project cycle, to create an enabling environment that will attract the private sector to invest in PPP road projects in Ghana. The final framework demonstrates new knowledge that has been acquired and the researcher's contribution to the body of knowledge.

Table 6- 7:Final Best Practice for PPP Inception Phase

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk
				Long-term at the policy level	Specific action, short term at the project level	
1	Road users not willing to pay realistic road tolls	Text for individual affordability and willingness to pay realistic tolls during the preparation phase	Viability of user-pays PPP road project depends on payment of realistic road tolls. Therefore, the government may grant a concession to a private investor to charge road users for using the road at the operation stage. In a situation where willingness to pay a realistic road toll is a problem for the road users, the government of Ghana may offer support by filling in the gap by providing Viability Gap Funding (VGF) to keep the price of the toll charges to a level socially and politically acceptable for the population.	The government should provide subsidies to support PPP road projects where users are not able to pay a realistic road toll. The PPP framework should provide clear rules for reporting and accounting for government fiscal commitment . Government can also set up a Viability Gap Fund to support PPP road project	The false expectation of user willingness to pay may lead to an underutilised and financial problem when completed. Authority should only tender out and enter into PPP contract when affordability (from government and individual perspective), and willingness test has been passed satisfactorily.	The willingness of road users to pay realistic toll could impact on the commercial viability of PPP road project. Therefore, the private investors should ensure availability to pay realistic toll is tested during project appraisal phase or VGF provision is made during the contract structuring phase.
2	Road users using alternative roads	Assess the impact of the alternative road on PPP road project	Traffic volume is a crucial input into the financial and economic viability and sustainability of toll road projects. Hence, road users using an alternative road could reduce the traffic volume and, consequently, affect the revenue streams. However, the road is public infrastructure, and therefore there must be an alternative road for those who are financially challenged.	The government should decide if alternative "free" roads should be made available to road users along the toll road corridor.	The decision to allow a free alternative route shall only be made after sound economic analysis has been conducted. Alternative roads should not be provided along the same PPP toll road.	The structure of the toll charges has implications on the private investor's income stream. Thus, the private investor should ensure the impact of all alternative roads are assessed and appropriate risk mitigation detailed in the contract.
3	Lack of adequate PPP skills and expertise	Attract and retain the right talent	Many PPP project failures have been as a result of poor identification, assessment, and preparation (appraisal) of the project, poor structuring and poor management of the tender process. For this reason, experienced advisors are highly recommended for appraising, preparing, structuring, and supporting the tender process.	The PPP legal framework should include a policy on how to assess staffing capabilities needs and hiring of experts. The government should resource the PPP unit and develop a policy to retain the public officials	Assess staffing capabilities and needs. Select firms with requisite experience and knowledge to manage PPP implementation. Attract and retain the right talent to a public sector to allow for a common baseline for PPP knowledge and best practices.	The private investor should ensure that the PPP procuring authority has adequate experience or expertise to manage the PPP implementation.

Table 6- 8: Final Best Practice for PPP Inception Phase cont.

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific action, short term at the project level	
4	Political instability	Ensure a stable political environment	No investor, whether local or international, will be comfortable investing in a country which is not politically stable. Political instability has led to the failure of some initiated PPP projects in some developing countries and may have deterred investors from investing in future PPP projects. However, a stable political environment attracts adequate private sector investors to invest in the roads sector.	Ensure political stability during and after general elections is observed. Also, the PPP framework should include a policy on how to protect the private sector investment in case of political instability	Engage the various political parties and obtain consensus across the political divide.	Political instability has harmed many countries' economic performance. Therefore, the risk is very high to invest in a country where there is no political stability. A private investor should be careful to invest in a country where there is not assured political stability.
5	Lack of government commitment to and support for PPP road projects	Government to show commitment and support for PPP road projects	Investors will invest in a country where there is clear government support for PPPs. Thus, the government communicating its commitment and support for PPP road projects will increase the attractiveness of the PPP market to private investors.	The government must create the necessary enabling environment for PPP road projects and demonstrate its willingness to supporting PPP road projects.	N/A	The private investors should ensure that all government support to the PPP road project is detailed in the contract during the structuring phase of the process cycle.
6	Lack of clear institutional and PPP legal framework	The government should provide a good and favourable institutional and legal framework	Private investors respond favourably to a simple and clear institutional and legal framework, where processes and procedures on how to engage with the public sector are spelt out. Establishing a clear PPP framework public communicates the government's commitment to PPPs Therefore, to attract private sector financing for PPP road projects, the government must develop a sound institutional and legal framework that set out rules, mechanisms, and procedures on how to govern the PPP implementation.	Government to provide favourable institutional and legal framework for PPP to guide government and private partners through each step in developing and implementing a PPP project.	Implement PPP road projects in line with the institutional and legal framework	The PPP legal and institutional framework should protect the private investors' investment and interest. Issues that are pertinent to the private investor which are not addressed in the framework should be discussed during the negotiation/dialogue phase.
7	Lack of commercially viable PPP projects	Prepare commercial PPP road projects	Commercially viable road projects are those that provide adequate revenue from project sources to cover capital costs and operation and maintenance costs. Private investors will invest in PPP road projects only when they can recoup their investments within the agreed concession period.	The government should provide direct financial support to ensure commercial feasibility. The PPP framework should indicate the source of the money and how to budget for Fiscal commitment and manage	Do not launch PPP projects unless there is strong evidence that the project is commercially and financially viable and affordable. Assess commercial viability from the lenders', investors' and commercial perspective.	The private investor expected revenues (inflows) should be sufficient to cover all expected costs (outflows). Otherwise, the investor should ensure government support to make the project commercially viable.

Table 6- 9: Final Best Practice for PPP Inception Phase cont.

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific action, short term at the project level	
8	Low traffic volume	Ensure traffic volume supports PPP road projects	The volume of traffic is critical to the sustainability of PPP road toll projects. Hence, tolled road traffic demand forecasting is a crucial input in the financial and economic appraisal of toll road projects.	The government should develop a policy for the utilisation of space/sites along the proposed PPP road corridor to build sectors that are sensitive to economic activities to generate third-party revenues or allow the private sector to develop collateral businesses	Model traffic on complex road networks and understand its impact on the viability of the PPP road project, mainly when alternative routes exist. Conduct detailed traffic and revenue studies to estimate demand and demand elasticity.	Traffic risk could have an adverse effect on a PPP road project. Therefore, the private investor should ensure that the government provides a guarantee for when traffic volume is below the baseline volume.
9	Local banks are not capable of providing long-term finance for PPP road projects.	Local banks are granting long-term loans for PPP road projects.	PPP requires long-term funding (between 25-30 years). Strong local commercial banks that can provide a long-term loan to private investors will increase the attractiveness of the PPP market to local and international investors.	The government should introduce reforms that will address the short-term loan tenor and short-term deposit regime of the commercial banks and Reforms to enhance local banks capacity to provide long term loan for PPP road project.	N/A	The risk is high when the local banks can not provide a long-term loan for PPP road project. Therefore the private investor should consider the availability of long-term loan within the host country before bidding for the PPP road project.
10	Lack of strong local capital market	Develop strong domestic capital market	PPP funding is mostly from debt, equity, and bonds; therefore, a robust domestic capital market will enable private investors to borrow money for PPP road projects from the local capital markets.	Governments must introduce structural reforms and manage the development of the local capital market.	N/A	The private investor should assess the effect of investing in PPP road project in a country where the capital market is not matured.
11	Lack of access to finance for PPPs.	Develop the local financing market for PPPs.	Local capital markets must be fully developed to support private sectors in financing PPP road projects. Government supplementing the private sector with financial support will increase the attractiveness of the PPP market to private investors.	The government should consider widening the sources of equity finance and encourage the use of long-term funds, like the pension funds for PPP road projects.	NA	The risk is high when there is no access to local funding for PPP road project. Therefore the private investor should consider the availability of long-term loan within the host country before bidding for the PPP road project.

Table 6- 10: Final Best Practice for PPP Inception Phase cont.

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific action, short term at the project level	
12	Unstable macro-economic and financial conditions	Ensure the macroeconomic environment is stable.	A good and stable macro-economic environment where depreciation of the currency is stable and where the interest rate and the rate of borrowing from the commercial banks is relatively low will increase the attractiveness of the PPP market to private investors.	The government must introduce a sound policy that will ensure macro-economic stability. And also support PPP road projects by providing a sovereign guarantee and debt guarantees	Macroeconomic assumptions (General inflation, relative inflation, base interest rates, risk-free interest rates and exchange rate) should be considered during the development of the financial model.	The private investor should assess the macroeconomic condition of the host country and its effect on its investment.
13	Lack of transparency in information disclosure	Institutionalise PPP information disclosure and transparency	Without a proper framework that incorporates the appropriate information disclosure provisions, transparency will deteriorate, and this will affect private sector interest in PPP road projects.	The PPP framework should include information disclosure management requirement, which will encourage proactive information disclosure of both the project contract and the project's performance to the key stakeholders.	The procuring authority should ensure that information disclosure clauses detailed in the contract during the structuring phase of the process cycle.	The private investor should ensure that transparency in information disclosure clauses are detailed and clarified during the contract structuring phase.
14	Successive government abandoning PPP Project	Engage opposition political parties.	Concession periods for PPP road projects usually far exceed the term of a government. After a change in government, the new administration may not have an interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change in government.	The government should build a political consensus on the use of the PPP model. Ensure national consensus on the eligible roads for PPP projects. The PPP framework should provide the private investor with significant protection in the case of unilateral termination	Follow the agreed PPP model and select road projects from the list of eligible roads. Ensure there is a political acceptance of the selected road projects. The contract should define and grant the private partner the right to be compensated in full in the event of unilateral termination	The private investor should ensure that the issue of government abandoning or terminating PPP project is considered as a risk and allocate it to the party able to manage it during the contract structuring phase.
15	Public opposition to PPP road projects	Engage the project key stakeholders and address their concerns	PPPs involve various stakeholders with different interests. Thus, the attitude of each stakeholder could influence the output of a PPP road project. Therefore, the commitment of all stakeholders should be sought during the project implementation.	The PPP framework should include a policy on stakeholders' engagement and management	Identify key stakeholders and develop a communication plan and describe the general strategy to be adopted in communicating to the stakeholders.	There could be a high possibility of the public opposing the PPP project when they are not well engaged during the project identification and appraisal phase. Therefore, the private investor should treat it as a possible risk.

Table 6- 11: Final Best Practice for PPP Procurement Phase

No	Challenges	Best practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific, short term action at the project level	
1	Lack of transparency and competitive bidding process	There should be adequate measures to ensure fairness and competition with the award of the PPP contract.	Private investors are often reluctant to invest in PPPs due to fear of an unfair bidding and procurement process. Without a proper procurement framework that encapsulates appropriate information disclosure provisions, transparency will suffer, and this may affect the interest of private investors to invest in PPP road projects.	The PPP framework should indicate the bidding and awarding criteria and how to test if the procurement process was competitive, transparent and conducted with integrity and fairness	Ensure the procurement process is fair and competitive. Follow the procurement processes outline in the procurement framework.	Lack of fairness, transparency and competitive procurement process is a risk the private investor must consider before bidding.
2	Lack of transparency in information disclosure	Institutionalise PPP information disclosure and transparency	Without a proper framework that incorporates the appropriate information disclosure provisions, transparency will deteriorate, and this will affect private sector interest in PPP road projects.	The PPP framework should include information disclosure management requirement, which will encourage proactive information disclosure of both the project contract and the project's performance to the key stakeholders.	The procuring authority should ensure that information disclosure clauses detailed in the contract during the structuring phase of the process cycle.	The private investor should ensure that transparency in information disclosure clauses are detailed and clarified during the contract structuring phase.
3	Successive government abandoning PPP Project	Engage opposition political parties	Concession periods for PPP road projects usually far exceed the term of a government. After a change in government, the new administration may not have an interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change in government.	The government should build a political consensus on the use of the PPP model. Ensure national consensus on the eligible roads for PPP projects. The PPP framework should provide the private investor with significant protection in the case of unilateral termination	Follow the agreed PPP model and select road projects from the list of eligible roads. Ensure there is a political acceptance of the selected road projects. The contract should define and grant the private partner the right to be compensated in full in the event of unilateral termination	The private investor should ensure that the issue of government abandoning or terminating PPP project is considered as a risk and allocate it to the party able to manage it during the contract structuring phase.

Table 6- 12: Final Best Practice for PPP Constriction Phase

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific action, short term at the project level	
1	Successive government abandoning PPP Project	Engage opposition political parties	Concession periods for PPP road projects usually far exceed the term of a government. After a change in government, the new administration may not have an interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change in government.	The government should build a political consensus on the use of the PPP model. Ensure national consensus on the eligible roads for PPP projects. The PPP framework should provide the private investor with significant protection in the case of unilateral termination	Follow the agreed PPP model and select road projects from the list of eligible roads. Ensure there is a political acceptance of the selected road projects. The contract should define and grant the private partner the right to be compensated in full in the event of unilateral termination.	The private investor should ensure that the issue of government abandoning or terminating PPP project is considered as a risk and allocate it to the party able to manage it during the contract structuring phase.
2	Public opposition to PPP road projects	Engage the project key stakeholders and address their concerns	PPPs involve various stakeholders with different interests. Thus, the attitude of each stakeholder could influence the output of a PPP road project. Therefore, the commitment of all stakeholders should be sought during the project implementation.	The PPP framework should include a policy on stakeholders' engagement and management	Identify key stakeholders and develop a communication plan and describe the general strategy to be adopted in communicating to the stakeholders.	There could be a high possibility of the public opposing the PPP project when they are not well engaged during the project identification and appraisal phase. Therefore, the private investor should treat it as a possible risk.
3	Political instability	Ensure a stable political environment	No investor, whether local or international, will be comfortable investing in a country which is not politically stable. Political instability has led to the failure of some initiated PPP projects in some developing countries and may have deterred investors from investing in future PPP projects. However, a stable political environment attracts adequate private sector investors to invest in the roads sector.	Ensure political stability during and after general elections is observed. Also, the PPP framework should include a policy on how to protect the private sector investment in case of political instability	Engage the various political parties and obtain consensus across the political divide.	Political instability has harmed many countries' economic performance. Therefore, the risk is very high to invest in a country where there is no political stability. A private investor should be careful to invest in a country where there is not assured political stability.

Table 6- 13: Final Best Practice for PPP Operation, Maintenance, and Transfer Phase

No	Challenges	Best Practice	Rationale	Recommended solutions/Actions (For Government)		Guidance for private investors to manage investment risk.
				Long-term at the policy level	Specific action, short term at the project level	
1	Successive government abandoning PPP Project	Engage opposition political parties	Concession periods for PPP road projects usually far exceed the term of a government. After a change in government, the new administration may not have an interest in the project of their predecessors and may revoke the concession agreement. Private investors need to have faith in the continuation of the original concession agreement after any change in government.	The government should build a political consensus on the use of the PPP model. Ensure national consensus on the eligible roads for PPP projects. The PPP framework should provide the private investor with significant protection in the case of unilateral termination	Follow the agreed PPP model and select road projects from the list of eligible roads. Ensure there is a political acceptance of the selected road projects. The contract should define and grant the private partner the right to be compensated in full in the event of unilateral termination	The private investor should ensure that the issue of government abandoning or terminating PPP project is considered as a risk and allocate it to the party able to manage it during the contract structuring phase
2	Public opposition to PPP road projects	Engage the project key stakeholders and address their concerns	PPPs involve various stakeholders with different interests. Thus, the attitude of each stakeholder could influence the output of a PPP road project. Therefore, the commitment of all stakeholders should be sought during the project implementation.	The PPP framework should include a policy on stakeholders' engagement and management	Identify key stakeholders and develop a communication plan and describe the general strategy to be adopted in communicating to the stakeholders.	There could be a high possibility of the public opposing the PPP project when they are not well engaged during the project identification and appraisal phase. Therefore, the private investor should treat it as a possible risk.
3	Road users using alternative roads	Assess the impact of the alternative road on PPP road project	Traffic volume is a crucial input into the financial and economic viability and sustainability of toll road projects. Hence, road users using an alternative road could reduce the traffic volume and, consequently, affect the revenue streams. However, the road is public infrastructure, and therefore there must be an alternative road for those who are financially challenged.	The government should decide if alternative "free" roads should be made available to road users along the toll road corridor.	The decision to allow a free alternative route shall only be made after sound economic analysis has been conducted. The alternative road should not be provided along the same PPP toll road.	The structure of the toll charges has implications on the private investor's income stream. Thus, the private investor should ensure the impact of all alternative roads are assessed and appropriate risk mitigation detailed in the contract.
4	Political instability	Ensure a stable political environment	No investor, whether local or international, will be comfortable investing in a country which is not politically stable. Political instability has led to the failure of some initiated PPP projects in some developing countries and may have deterred investors from investing in future PPP projects. However, a stable political environment attracts adequate private sector investors to invest in the roads sector.	Ensure political stability during and after general elections is observed. Also, the PPP framework should include a policy on how to protect the private sector investment in case of political instability	Engage the various political parties and obtain consensus across the political divide.	Political instability has harmed many countries' economic performance. Therefore, the risk is very high to invest in a country where there is no political stability. A private investor should be careful to invest in a country where there is not assured political stability.

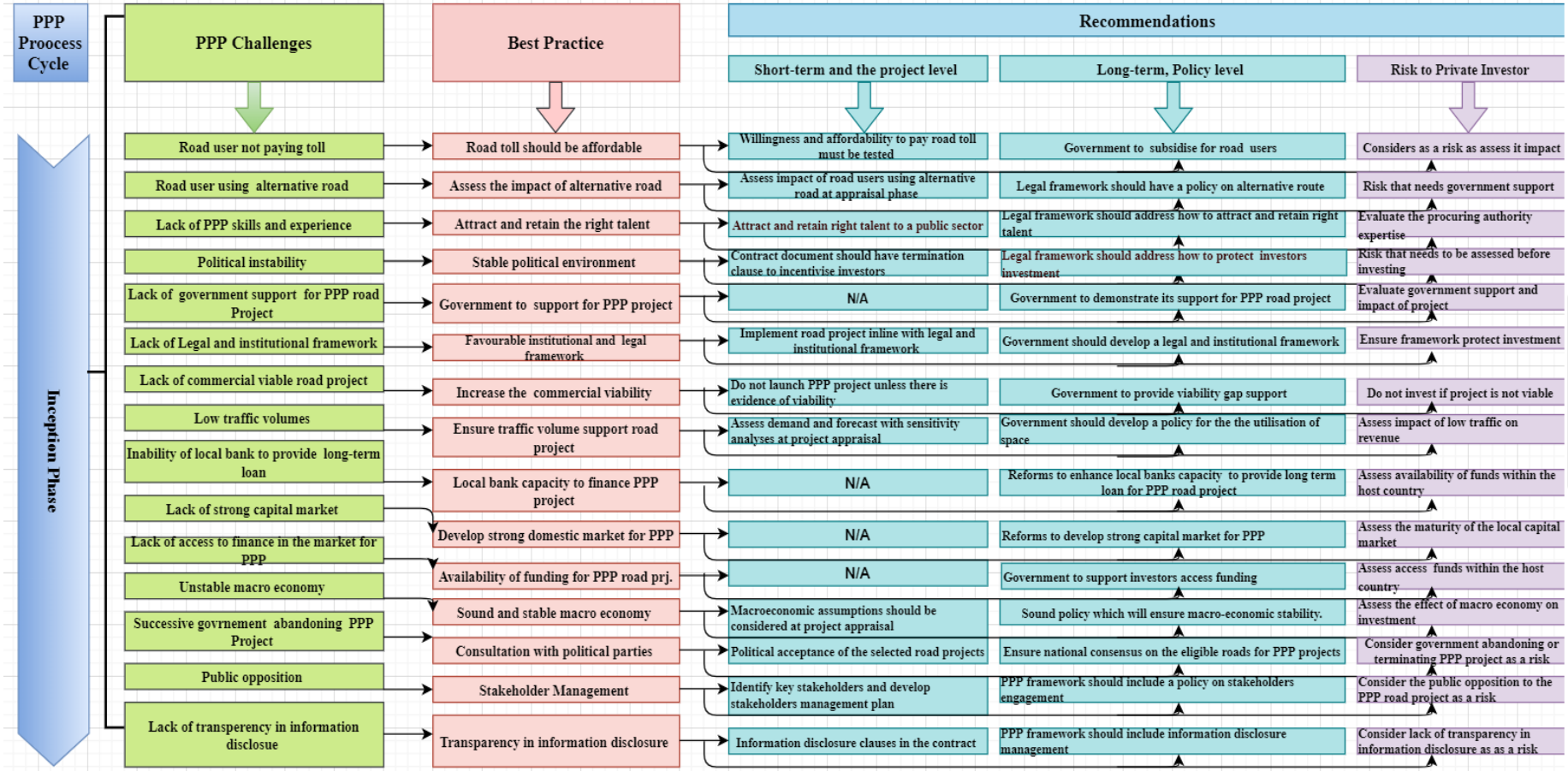


Figure 6- 2: Final Best Practice for PPP during the Inception Phase

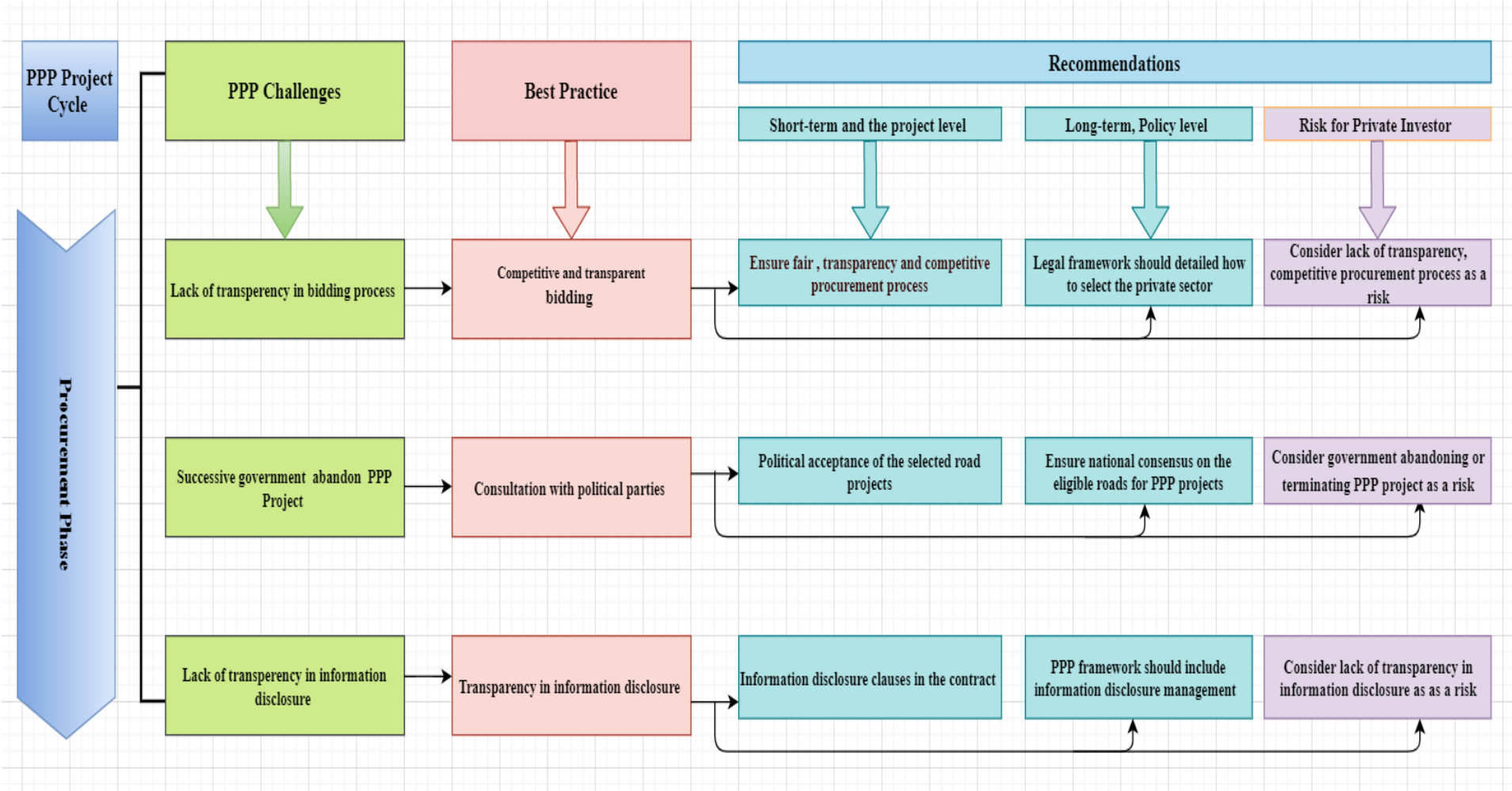


Figure 6- 3: Final Best Practice for PPP during the Procurement Phase

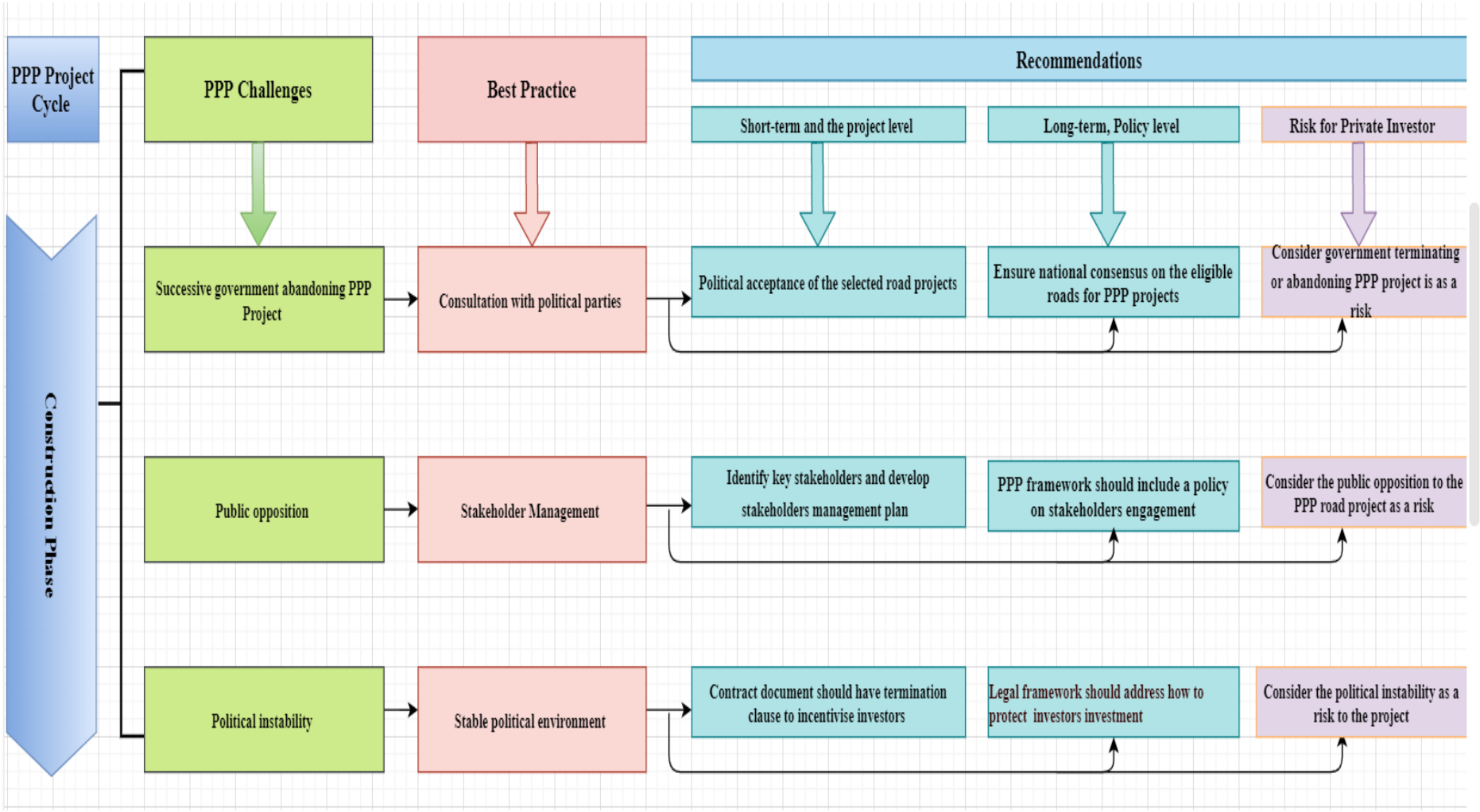


Figure 6- 4: Final Best Practice for PPP during the Constriction Phase

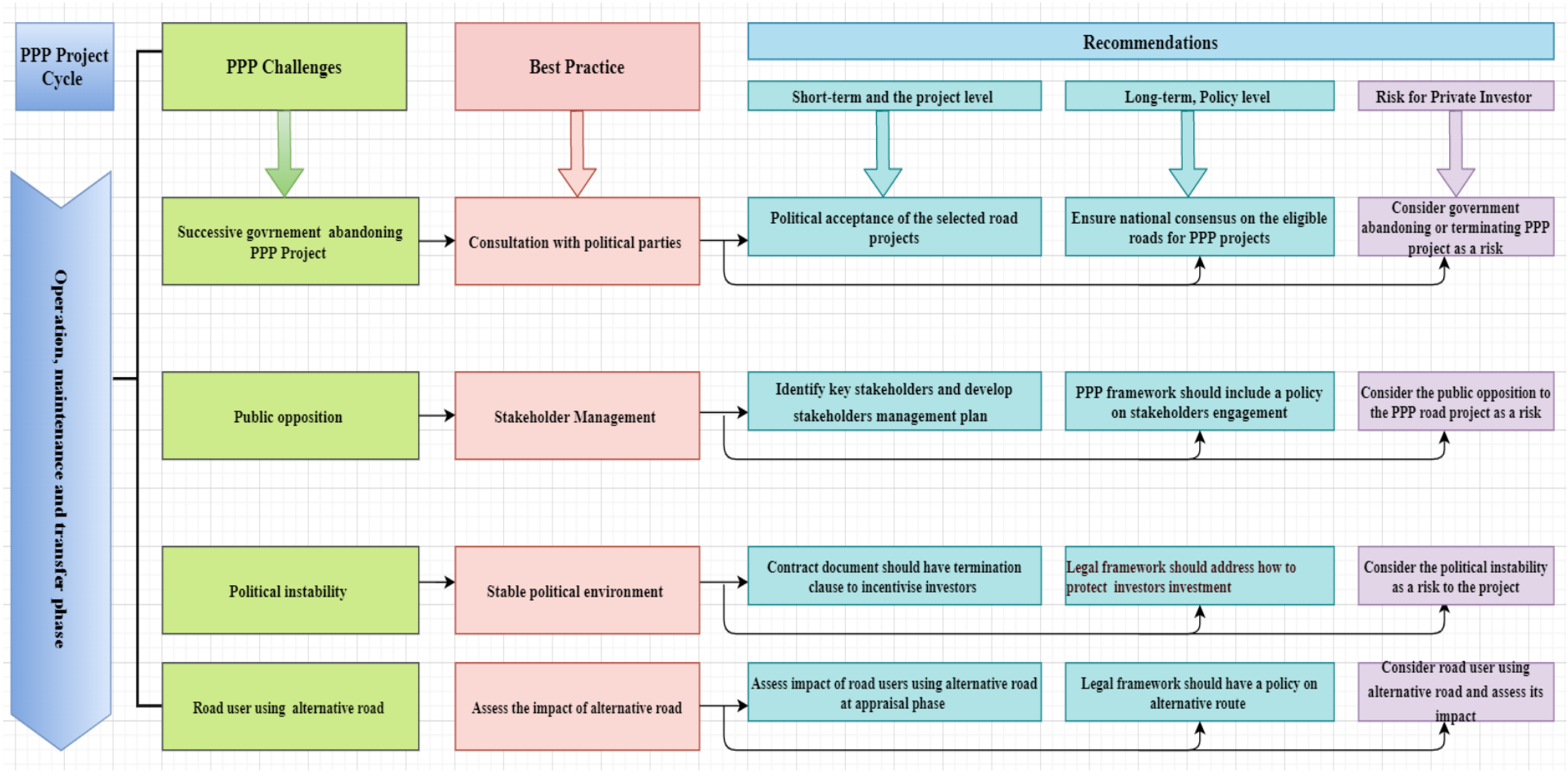


Figure 6- 5: Final Best Practice for PPP during the Operation, Maintenance, and Transfer Phase

6.4 Chapter Summary

This chapter has demonstrated a theoretical justification for the adopted approach for the development and validation of the best practice framework for PPP implementation in road projects. The feedback from the validation participants was positive in terms of the relevance of the identified challenges, usefulness of the best practice identified from the review of the literature and cases from past PPP road projects, the comprehensiveness of the proposed solutions, the challenges and best practices within each PPP process cycle, and the extent to which the best practice framework if implemented, can help in attracting private sector investment in PPP road projects in Ghana. Based on the results of the research findings and the validation of the framework, the final research objective has been achieved. As a result, a best practice framework for implementing PPP projects in Ghana's roads sector has been delivered. The presented framework, which addresses the challenges preventing the private sector from investing in PPP road projects, will enable practitioners in Ghana from the public sector to address the issues that will make PPP road projects attractive to private sector investors.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 Chapter Introduction

This chapter presents the general conclusions and recommendations. First, it summarises a review of the research process. Next, it summarises the finding and describes how the research aim and objectives were achieved. The subsequent section discusses the key contributions of the research. Finally, the chapter presents some recommendations for industry practitioners and policymakers.

7.2 Review of the Research Process

The study began with a comprehensive review of literature in the area of PPPs. The review indicated that some global challenges prevent the private sector from investing in PPPs. These challenges were for the construction industry in general. Therefore, the challenges were validated and contextualised in the context of the Ghana roads sector through semi-structured interviews. The results that emerged from the semi-structured interviews helped to formulate the questions for the questionnaire survey. The study aim was to develop a best practice framework to address the challenges that emerged from the study. The study achieved the aim through the development of a validated framework which addresses the factors preventing the private sector from investing in PPP road projects in Ghana. Suggestions on how to overcome these challenges are addressed in this research. The overall research aim was achieved through four research questions (refer to section 1.6) and four research objectives (refer to section 1.7). Four sources of inputs, namely, literature review, interviews, survey questionnaire, and documents, enabled the researcher to achieve the research aim. In pursuing this aim, four objectives were established. The fulfilment of each of the objectives is detailed in the following sections.

7.3 Summary of Objectives and Conclusions

7.3.1 Objective One: Critically Examine the Existing Knowledge Related to PPPs

The literature review documented that financing of public infrastructure projects in Ghana has predominantly been from government-generated inflows. These funds are, however, inadequate to provide the necessary infrastructure needed for the development of the country. It was noticed that Ghana needs efficient infrastructure, including in roads, railways, and energy, to drive the

industrialisation agenda of the country. However, bridging Ghana's infrastructure deficit will require about US$ 30 billion annually with the roads sector alone amounting to US$ 400 million (refer to section 1.2). However, comparing the revenue inflow with the huge expected financial commitment of the government of Ghana, it is evident that it will be a challenge for the government to create the required space in its budget to provide the necessary financial outlay for the maintenance of existing highways and to close the road infrastructure gap that will bring comfort to the citizens and ensure the economic growth of the country. The PPP concept was seen as an alternative to the TPM because of its success stories in some developed and developing countries. Hence, the researcher conducted a literature review on a wide range of issues relating to existing knowledge on PPPs) as documented in Chapter Two.

This chapter initially reviewed the literature on infrastructure financing (refer to section 2.15). The literature on PPP vehicles and drivers and the successes or failures were also reviewed (refer to sections 2.8, 2.14 and 2.16). Findings from documents and the reviewed literature indicated that since the introduction of PPPs in Ghana, the roads sector had not received the needed private sector investment. This led to a review of challenges preventing the private sector from investing in PPP road projects in Ghana (refer to section 2.16). Having identified these challenges, the literature and documents about the best practices to address the identified challenges were also reviewed (refer to section 2.17). Interviews and survey findings confirmed some of the identified challenges. It was observed from the review of the literature that with a best practice framework, the issues could be managed and thereby, it was possible to create an enabling environment for the private sector to invest. This led to the development of the conceptual framework (refer to section 2.18).

7.3.2 Objective Two: Challenges Preventing the Private Sector from Investing in PPP Road Projects in Ghana

The findings from the semi-structured interviews were used as a basis to design the survey questionnaire (refer to section 4.4). These challenges were analysed using Kendall's coefficient of concordance (refer to section 4.5.5.1) and the Mann-Whitney U test (refer to section 4.5.5.2). At the end of the data analysis, one of the challenges (private investors not able to recoup their investment within the concession period) was rejected and removed from the list of challenges because there was a statistically significant difference among the participants' responses (refer to section 4.5.5.2.2). In total, seventeen PPP challenges emerged after the analysis; out of the seventeen, four related to the

"economic and financial challenges", three directly related to "economic viability of PPP project challenges", and six were in respect of "political and policy challenges". Also, two related to "corrupt practice challenges", and three related to "public support for PPP-challenges". On the grounds of this, the objective has been achieved, and the results are summarised in Table 4.25.

7.3.3 Objective Three: Explore Best Practices that can address the Identified Challenges from the Study

In the absence of a robust and bankable pipeline of PPP road projects in Ghana, some of the best practices were acknowledged from global best practices. These include lessons learnt from cases of PPP road projects recorded in the reviewed literature and other relevant documents. As presented in Table 2.6, 41 best practices were identified from the reviewed literature and related documents. Based on a critical content analysis of the reviewed literature, 17 out of the 41 best practices which were applicable to address the challenges that emerged from the research findings were derived (refer to Table 5.2). The source of the best practice and the rationale for each of the proposed best practices have been discussed in section 5.4. On the strength of this, therefore, the objective has been achieved.

7.3.4 Objective Four: Development of Best Practice Framework

Addressing the identified challenges that prevent the private sector from investing in PPP road projects in Ghana will enhance the attractiveness of PPP road projects to private investors. The results of the literature review, the semi-structured interviews, and the quantitative data analysis of the questionnaire survey showed how issues related to the PPP challenges could be managed with the adoption of the proposed PPP best practices. Based on these findings, a general problem-solving methodology, and frameworks and models developed for construction projects by some earlier researchers, a proposed best practice framework was developed for PPP road projects in Ghana. The rationale behind the framework is to address the issues preventing the private sector from investing in PPP road projects from the perspective of the government. The proposed final best practice framework is shown in Tables 6.5 to 6.11 and Figures 6.2 to 6.5. The practical applicability and the usefulness of the proposed framework were validated through nine questionnaire surveys. The validation results from some of the participants recommended the rearrangement of some of the challenges relative to the PPP project cycle. The proposed final best practice framework was further

improved based on participants' feedback and recommendations. The validated framework, if implemented, could create the necessary enabling environment for PPP road projects in Ghana.

7.4 Recommendations

7.4.1 Recommendations for Government and Policy Makers

The findings from the study have shown that the successful implementation of a PPP requires an enabling environment to be in place for PPP projects to be implemented effectively and with maximum benefit to both the public sector and the private sector. Thus, to stimulate the private investors' interest in PPP road project, it is widely accepted that creating an enabling environment for PPP cannot be underestimated. Therefore, the final proposed best practice framework offers useful strategies and procedures that will improve the investment climate for PPP practice in Ghana and developing countries in general. First, the framework informs the government, policymakers and developing countries of similar social,-economic conditions on issues which have to be addressed at every stage of the PPP project cycle to create the necessary enabling environment that will incentivise the private sector to invest in PPP road projects.

For instance, at the inception phase of the PPP process cycle, the government and its implementing authority or agency should test for road users' willingness and affordability to pay realistic road tolls, addressing the issue about alternative roads, training and retaining experienced public sector officials, and creating a stable political environment. Besides, the government should communicate its commitment to and support for PPP road projects, provide a good and favourable institutional and legal framework, prepare commercially viable PPP road projects, ensure that traffic volume supports the PPP road project, ensure that the local banks or a consortium of local banks are capable of providing long-term loans for PPP road projects, develop a robust domestic capital market, develop the local financing market for PPPs, ensure macroeconomic stability, create a robust local market for PPPs, ensure transparency in information sharing and consultation, and engage the stakeholders to enlist their support.

At the second phase (procurement phase) of the PPP process, transparency is very crucial. Therefore, there should be adequate measures to ensure fairness and competition in the awarding of PPP contracts. Transparency in information sharing and consultation and the engagement of opposition

political parties will help to build a consensus on the use of PPP for the development of some selected roads. The third phase (construction phase) of the PPP process requires consistent monitoring by the contracting authority and adherence to output specifications on the part of the investor. Additionally, strong political consensus on the use of the PPP model is required with consultation and engagement with all opposition stakeholders to address their concerns through dialogue, and the government should ensure a stable political environment throughout the construction stage of the project. Finally, during the final phase (operations, maintenance, and transfer) of the PPP process, the issue of alternative roads should be monitored and managed. Also, there should be a political consensus on the use of the PPP model and consultation and engagement with all opposition stakeholders; their concerns should be addressed through dialogue, and the government should ensure a stable political environment throughout the construction stage of the project.

7.4.2 Recommendations for Private Investors

PPP is at the heart of a government's attempts to develop infrastructure investments, but this strategy comes with considerable risks. Neither governments nor private investors alone are likely to have the resources to build essential infrastructure and bear all the risks. The PPP process comprises of many phases and many stakeholders with diverse interests. Its implementation requires a significant amount of time and resources. Therefore, a private investor should not bid for a PPP road project only because the project seems attractive. Instead, the PPP investor must ensure that the return on its investment is positive. Again, PPP project implementation requires a lot of financial and human resources. So, to ensure that the private investor's resources are well-spent, the private investor must ensure that the necessary enabling environment for PPP within the host country is created. Additionally, the private investor must ensure that the PPP legal framework protects the private investor's investment.

7.5 Contribution to Knowledge and Practice

This research offers contributions to the advancement of theory as well as practical understanding in the area of PPP in road projects, as discussed in the subsequent sections.

7.5.1 Theoretical Contributions

The significance of this research is demonstrated by its theoretical contributions to PPP literature and research. This research has addressed deficiencies in the existing literature in several ways. Firstly,

this research has identified a set of challenges preventing the private sector from investing in PPP road projects. Secondly, it has identified best practices to address the identified challenges. In the existing literature, to date, no study has explored such findings specific to PPP road projects in Ghana. The theoretical contributions are summarised as follows:

a) It establishes 17 roads sector-specific challenges preventing the private sector from investing in PPP road projects using a single sequential exploratory method (qualitative and then quantitative). Therefore, this study contributes to the existing body of knowledge;

b) It also contributes to the existing literature by identifying 17 best practices through the global best practices and literature review to address the challenges identified from the study; and

c) Empirical studies in developing and developed countries on challenges preventing the private sector from investing in road PPP projects and best practice framework to address the problems are limited. Thus, this study employed a pragmatist research approach comprising of a semi-structured and quantitative approach to identify the factors preventing the private sector from investing in PPP road projects in Ghana. This research approach is a novelty, therefore a contribution to knowledge.

7.5.2 The Practical Contributions

From a practical perspective, the proposed best practice framework will benefit governments involved in PPP road projects in many ways. For example, the proposed framework depicts a list of best practices to address issues important for the sustainability of PPP road projects. Therefore, the framework will act as a reference point when an issue relative to private sector investment in PPP road projects arises. The practical contributions are summarized as follows:

a) It depicts a list of best practices to address road project-related issues relative to what prevent the private investors from investing in PPP road project. Therefore, the framework will act as a reference point for countries with similar socio-economic conditions when an issue related to PPP road projects arises;

b) It proposes tailored-made solutions to address the identified challenges. Therefore, the solution will act as a blueprint for PPP road projects in other countries with similar conditions; and
c) The framework catalogue issue that governments should address to create the enabling environment that will attract the private sector to invest in PPP road projects in Ghana. Additionally, it offers guidelines to the private investor on how to mitigate its risk.

7.5 Limitations of the Research

Several limitations were noticed while conducting this research. First, a larger questionnaire response would have increased the credibility of the results from the survey analysis. Second, PPP practice in the Ghana road sector is not matured; therefore, obtaining the views of experts on the best practices during the semi-structured interviews was found to be difficult. However, a rigorous scientific method was employed in developing the best practices. The best practices were derived partially from literature and cases of PPP road projects from developing and developed countries.

7.5 Recommendations for Future Research

This research has explored an area that is still largely unfamiliar in the field of PPP project implementation. Therefore, more research could be undertaken in some areas which are still uncharted. For example, it is suggested that future research studies could adopt the best practice framework and test it on a PPP road project throughout its process cycle. Further research could be conducted to investigate the outcome of the implementation of the issues catalogued in the framework. Also, as discussed in section 2.5, there are three types of PPP models, typically used for road and highways projects. The kind of model employed in Africa to date so far is the concession PPP model. Researchers in the field could explore the applicability of the "availability and shadow payment" model, which is principally used in the UK.

7.6 Final Note

This chapter summarized the key findings from the literature, semi-structured interviews and survey questionnaire, contribution to knowledge and practice, limitations of the research and recommendations for future research. The existing literature on factors preventing the private sector

from investing in PPP road project and best practice for PPP road project was lacking. Therefore, part of this need was addressed in this research by identifying the challenges an incorporating global best practice that could create the necessary enabling environment for the private sector to invest in PPP. In this respect, this research provided a better understanding to the problem preventing the private sector from investing in PPP road project in Ghana and also reduced the gap in theory and practice within the Ghanaian road sector.

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APPENDICES

Appendix A: Ethical Approval

University of Salford MANCHESTER

Research, Innovation and Academic Engagement Ethical Approval Panel

Research Centres Support Team
G0.3 Joule House
University of Salford
M5 4WT

T +44(0)161 295 5278

www.salford.ac.uk/

20 July 2017

Richard Boadi

Dear Richard,

RE: ETHICS APPLICATION STR1617-96: Framework to promoting private sector to finance road infrastructure projects in Ghana through public- private partnership (PPP).

Based on the information you provided, I am pleased to inform you that your application STR1617-96 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,

Dr Anthony Higham
Chair of the Science & Technology Research Ethics Panel

Appendix B: Interview Participant information sheet

PARTICIPANT INFORMATION SHEET

Title of Project: **FACTORS PREVENTING THE PRIVATE SECTOR FROM INVESTING IN PPP ROAD PROJECT PROJECTS IN GHANA**

Note*: I would like to invite you to take part in a research study. Before you decide you need to understand, why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or would like more information. Take time to decide whether to take part.*

This study is part of a PhD research, which aims at developing a strategic framework to attract private sector investment into road infrastructure project in Ghana.

What is the purpose of the study?

Is to develop a strategic framework to attract privates sector investment into road projects in Ghana and in turn assist the Government of Ghana in taking an informed decision on policy reforms, if any at all, towards creating of an enabling environment for PPP to thrive in the road sector of Ghana.

Why have I been invited?

Six (6) organisations are invited to be part of this study, and your organisation is one of them. Top managers of these organisations will be asked a number of questions in a Semi-Structuredd interview to solicit their opinion on PPP and what in their view impede on implementation of PPP in the road sector in Ghana.

Do I have to take part?

It is up to you to decide. We will describe the study and go through the information sheet, which we will give you. We will then ask you to sign a consent form to show you agreed to take part. You are free to withdraw at any time, without giving a reason. (if applicable – this will not affect the standard of care you receive).

What will happen to me if I take part?

- There is a face-to-face Semi-Structured interview.
- This interview will happen twice within one year of the study; during the information gathering stage and the validation of the developed framework stage
- Each interview session will take not more than 1 hour.
- All electronic data will be password protected. While the hardcopy data will be stored in safe and secure place with limited access to my supervisor and me. Also all data will be pack up on DVD and stored in another safe place in case of losing and piece of data.

- During the interview, you will answer some questions. Your answers will be treated as qualitative data and will be analyse through computer-assisted qualitative data analysis software (CAQDAS) programme, such as the Nvivo.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks in this study.

What are the possible benefits of taking part?

We cannot promise the study will help your organisation but the information we get from the study will help developing a strategic framework to attract private sector investment into road projects in Ghana and in turn assist the Government of Ghana in taking an informed decision on policy reforms, if any at all, towards creating an enabling environmental for PPP to thrive in the road sector of Ghana. The study will also increase the understanding of private sector investment in road infrastructure projects in Ghana and contribute to knowledge and practice

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions.

Will my taking part in the study be kept confidential?

All information, which is collected, about you during the course of the research will be kept strictly confidential, and any information about you which leaves the university will have your name and address removed so that you cannot be recognised.

What will happen if I do not carry on with the study?

If you withdraw from the study all the information and data collected from you, to date, will be destroyed and you name removed from all the study files.

What will happen to the results of the research study?

The results will be used to develop a strategic framework to attract private sector investment into road projects in Ghana . Part of the result will be published. You will not be identified in any report/publication unless you have given your consent.

Who is organising or sponsoring the research?

Salford University

Contact details:

Researcher Name: Richard Boadi

Phone No: 020-393 8859

E-mail:rboadi2001@gmail.com

Appendix C: Consent Form for Survey Participants

RESEARCH PARTICIPANT CONSENT FORM

Title of Project: A BEST PRACTICE FRAMEWORK FOR PPP ROAD PROJECT: A CASE OF GHANA

Ethics Ref No: STR1617-96

Name of Researcher: Richard Boadi

(Tick as appropriate)

- I confirm that I have read and understood the information sheet for the above study (version 1- 24th May 2017) and what my contribution will be. Yes No
- I have been allowed to ask questions (face to face, via telephone and e-mail) Yes No
- I agree to take part in the Semi-Structured Interview Yes No
- I understand that my participation is voluntary and that I can withdraw from the research at any time without giving any reason Yes No
- I understand how the researcher will use my responses, who will see them and how the data will be stored. Yes No
- **I agreed to take part in the above study** Yes No

Name of participant ……

Signature……...

Date……...

Researchers' email address……...

(Add Participant consent letter as requested from the first version comments

Appendix D: Semi-structured Interview Guideline

Question	Semi-Structured Interview Questions guide	Fellow-up Questions and Pointers
Q I	Please can you tell me about your background, organisation and your roles and responsibilities?	
Q2	Please, what is your understanding of PPPs	• Please, do you think PPP can be implemented in the road sector of Ghana?
Q3	Please, in your view, what are some of the factors that can prevent the private sector from investing in PPP road project in Ghana?	• Are there the necessary legislative and institutional frameworks to motivate the private investor to invest in road projects in Ghana? • Does the current tariff legislation/ policy gives the right to the private investor to charge road-user to cover investment? • **If no**, could a reform of the existing law/policy motivate the private sector to invest in PPP road projects? • Successive government willing to continue PPP road projects
Q4	One of the objectives (b) of PPP as in the Draft PPP Act, is to create the necessary enabling environment for private sector participation in infrastructure development in Ghana, In your view do you think enabling environment has been created for the Privates sector to participant in road infrastructure development in Ghana.	• **If no**, what do you think can be done to create such an enabling environment for PPP?
Q5	Can you please enlighten me about Commercial Viable PPP Project?	• In your view, are there commercially viable PPP road projects in Ghana? • **If no**, why and what can be done?
Q6	Please, in your view how do you assess the local commercial banks capacity and skills to manage PPP road projects	• Local Commercial Banks suited to hold long-term infrastructure debt. • Do the local Commercial Banks have the capacity to provide long-term loan to finance PPP road project?
Q7	Do we have a robust financial and capital market to finance PPP road projects in Ghana?	• What do you think can be done to improve the situation?

Appendix E: Invitation Letter for Survey Participants

FACTORS PREVENTING THE PRIVATE SECTOR FROM INVESTING IN PPP ROAD PROJECT PROJECTS IN GHANA

May 10, 2018

Dear Respondent,

I am a PhD research student at the University of Salford, Greater Manchester, United Kingdom, and I am to conduct a study on **factors that are preventing the private sector from investing in PPP road project projects in Ghana**. This questionnaire forms an important part of the data collection instruments. The questionnaire comprises of section A & B, with a total question of 10 closed-ended questions, which the respondents are at liberty to tick the appropriate box and also could comment at the space provided.

It is hoped that the results of the research will help to **develop a PPP best practice for road projects in Ghana.**

I undertake to ensure that the confidentiality of the respondents is strictly maintained. The questionnaire is expected to be returned on or before 31st May 2018. Your contribution is very much appreciated.

Richard Boadi

Ministry of Roads and Highways,

(Department of Urban Road)

Ministries,

Accra, Ghana,

Tel: 020 3938859

Appendix F: Survey Questionnaire

SECTION A: PARTICIPANT BACKGROUND, EXPERIENCE AND KNOWLEDGE

Question A1: Which of the following describe your organisation? (**Kick the appropriate box)**

Consultant	
Contractor	
Client/ Employer	
Financial Services and Banking	
University / Academic Institution	
Other, please specify	

Question A2: Which of the following describe your professional? (**Kick the appropriate box)**

Construction Manager	
Construction Project Manager	
Quantity Surveyor	
Civil Engineer	
Structural Engineer	
Other, please specify:	

Question A3: How many years of professional experience do you have? (**Kick the appropriate box)**

0 – 5 years	
6 – 10 years	
11 – 15 years	
Over 20 years	

Question A4: Which of this describe your sector? **Kick the appropriate box)**

Private sector	
Public sector	

Question A5: Please, what is your level of knowledge or experience in PPP? (**Kick the appropriate box)**

Poor	
Fair	
Good	
Very good	
Excellent	

SECTION B: CHALLENGES PREVENTING THE PRIVATE SECTOR FROM INVESTING IN PPP ROAD PROJECTS IN GHANA

Question B1. Based on your experience or knowledge, which of the following Economic and Financial challenge can prevent the private sector from investing in PPP road projects in Ghana?

Please indicate your level of agreement or disagreement to the following statements in accordance with the following ratings: **1 = Strongly disagree, 2 = disagree, 3 = neither agrees nor disagree, 4 = Agree and 5 = Strongly agree.**

	Economic and Financial Market	**Ratings**				
		1	**2**	**3**	**4**	**5**
1	Local banks inability to provide long-term loans for PPP road projects					
2	Lack of access to finance for PPP project					
3	Unrealistic road toll charges					
4	Lack of strong Local Capital Market for PPP					
5	Unstable macroeconomic and Financial conditions					

Comments:……

……..

Question B2. Based on your experience or knowledge, which of the following Economic viable project related challenge can prevent the private sector from investing in PPP road projects in Ghana?

Please indicate your level of agreement or disagreement to the following statements in accordance with the following ratings: **1 = Strongly disagree, 2 = disagree, 3 = neither agrees nor disagree, 4 = Agree and 5 = Strongly agree.**

Economic Viable PPP road Project		**Ratings**				
		1	**2**	**3**	**4**	**5**
1	Lack of PPP road bankable projects					
2	Low traffic volume projection					
3	Lack of commercially viable PPP road projects to attract private investors					
4	Private investors not able to recoup their investment within the concession period					

Comments:……..

……

Question B3. Based on your experience or knowledge, which of the following Governance, Political and Policy related challenge can prevent the private sector from investing in PPP road projects in Ghana?

Please indicate your level of agreement or disagreement to the following statements in accordance with the following ratings: **1 = Strongly disagree, 2 = disagree, 3 = neither agrees nor disagree, 4 = Agree and 5 = Strongly agree.**

	Governance, Political and Policy related challenges	Ratings				
		1	2	3	4	5
1	Lack of suitable skills and experience of PPP professionals					
2	Absence of clear institutional and PPP legal framework					
3	Political instability					
4	Political interference on PPP road projects					
5	Non-continuation of uncompleted PPP road projects by successive government.					
6	Lack of government support for PPP road projects					

Comments:……..

……

Question B4. Based on your experience or knowledge, which of the following Public support related challenge can prevent the private sector from investing in PPP road projects in Ghana?

Please indicate your level of agreement or disagreement to the following statements in accordance with the following ratings: **1 = Strongly disagree, 2 = disagree, 3 = neither agrees nor disagree, 4 = Agree and 5 = Strongly agree.**

	Political and Policy Challenges	Ratings				
		1	2	3	4	5
1	Public opposition to the PPP road projects					
2	Road users not ready to pay realistic tolls					
3	Risk of road users using alternative roads rather than the toll roads					

Comments:…….

……

Question B5. Based on your experience or knowledge, which of the following corruption related challenge can prevent the private sector from investing in PPP road projects in Ghana?

Please indicate your level of agreement or disagreement to the following statements in accordance with the following ratings: **1 = Strongly disagree, 2 = disagree, 3 = neither agrees nor disagree, 4 = Agree and 5 = Strongly agree.**

	Political and Policy Challenges	**Ratings**				
		1	**2**	**3**	**4**	**5**
1	Lack of transparency and competitive bidding process					
2	Lack of transparency in information disclosure					

Comments:…….

If you would also like to receive the research findings or would be willing to be contacted with regards to your responses, please provide your contact information and tick the appropriate choice below:

Name of respondent:	
Address:	
Email:	
Telephone/Mobile No:	

……

END OF QUESTIONNAIRE - THANK YOU FOR YOUR TIME

Appendix G: Framework Validation Questionnaire

Dear participant,

I am Richard Boadi, a PhD student at the School of the Built Environment, University of Salford, Manchester-UK. I am conducting a study to understand the factors that could prevent the private sector from investing in Public-Private Partnerships (PPP) road projects in Ghana. The findings of the study have led to the development of the attached 'best practice framework', the framework, if implemented could help the Government of Ghana and the Ministry of Roads and Highways in attracting private sector investment in PPP road projects in Ghana.

You have been selected to participate in the framework validation because of your work experience and knowledge in PPPs. I believe that your experience and perspectives will help in **VALIDATING THE ATTACHED BEST PRACTICE FRAMEWORK**. Also, feel free to provide any suggestions or contributions regarding any area that needs to be improved or modified within this proposed framework.

I wish to assure you that I will take all the required ethical concerns into consideration. Any other ethical issues related to the research philosophy have been considered by the researcher and the University of Salford.

Thank you

Yours Sincerely,

Richard Boadi

Contact: rboadi2001@gmail.com

020 3938859

QUESTIONNAIRE FOR VALIDATING THE ATTACHED BEST PRACTICE FRAMEWORK

Name of Respondent (optional):

Sector: Public ☐

Private ☐

Designation:

Organisation:

1. How would you rate the relevance of the challenges presented in the attached framework that could prevent the private sector from investing in PPP road projects in Ghana? Please tick box that represents your views below.

Not relevant	Slightly relevant	Not sure	Relevant	Very relevant
1	2	3	4	5

2. Are the best practices useful in addressing the challenges in the attached framework? Please tick box that best represents your views below.

Not useful	Slightly useful	Not sure	Useful	Very useful
1	2	3	4	5

3. How would you rate the usefulness of the proposed actions for implementation? Please tick box that best represents your views below.

Not comprehensive	Slightly comprehensive	Not sure	Comprehensive	Very comprehensive
1	2	3	4	5

4. How appropriate are the challenges, best practices and actions within each stages of the Ghana PPP project cycle? ***(You may refer to the attached diagram of PPP project stages in Ghana)***

Not appropriate	Quite appropriate	Not sure	Appropriate	very appropriate
1	2	3	4	5

5. In your opinion, to what extent would this framework, if implemented, help in attracting private sector investments in PPP road projects in Ghana? Please tick box that best represents your views below.

To no extent	To a low extent	Not sure	High extent	To a very high extent
1	2	3	4	5

6. Do you have further comments/ suggestions regarding any area that needs to be improved/ included/ modified within the proposed framework?

……
……
……

Appendix H: Annotated of the condition of some Ghana roads


TARKWA TO
TAKORDI
4 HOURS'
HAULAGE
TRUCKS
HAVE KILLED
OVER 100


FIX ABANDONED