

ASSESSMENT OF RISK INVOLVED IN HOUSING PROJECTS PROCURED USING PUBLIC PRIVATE PARTNERSHIP SYSTEM IN NIGERIA

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Abstract

Public Private Partnership (PPP) has become a popular procurement system in most developed and developing countries around the world today. Despite its immense benefits such as ease in providing public infrastructures and providing an avenue for risk sharing and transfer, it still has its associated problems. PPP requires a detailed understanding of the client's objectives, which in most cases depends on mutual understanding between parties involved. This research therefore assessed the risks involved in housing projects procured using PPP system in Nigeria. A survey design was employed and 63 construction professionals were sampled. Data gathered were analyzed using frequency, percentage and mean item score. The study revealed that force majeure, unstable government and construction failure are some of the critical risk associated with housing projects procured through PPP but with varying degree of occurrence in the Nigeria construction industry. The study further recommends that consideration should be given to effective management and the ability of the end users to afford houses procured using the PPP system. Also proper awareness of both the public and private sector on the inherent risks in PPP procurement system is necessary and this can be done through seminars, conferences and workshops organized by various construction bodies and procurement units across the country.

Keywords: *Housing, Nigeria, Procurement, Public-Private Partnership, Risk*

INTRODUCTION

Over the past years, man's major desire has been that of comfortable housing system to serve as shelter. This need has proven to be one of the basic necessities of life after food. A house occupies a unique place in the life of human beings; a person requires security, privacy and certain elements of personal identification which a house can offer (Oke, Ibrinke and Evue, 2012). Unfortunately, the adequacy of this cannot be guaranteed in most developing countries around the world (Taiwo and Adeboye, 2013). Arayela and Taiwo (2010), opined that housing shortages have been recorded in both rural and urban communities of most African countries with the latter being more critical. This situation is not different in Nigeria as the rapid rate of urbanization is noted to account for the depreciating quality of housing in the country's urban centres (Olotuah and Taiwo, 2013). Oladapo and Olotuah (2007) observed that the urban centres suffer deterioration of infrastructure and urban services.

As with other developing nations across the world; over the past three decades, governments in Nigeria at all levels; (i.e. Federal, State and local) have been responsible for the development of infrastructural facilities (Awodele, 2012) housing inclusive. The conditions have however changed recently as the government is now seeking alternative means of financing infrastructures across the economic and social spectrum through the use of Public Private Partnerships (PPP). This is as a result of the fact that the quantum of revenue generated by the economy cannot support the growing demand for the provision of the needed infrastructures (Awodele, Ogunsemi and Olabode, 2008).

According to Paul, Shin and Tkachenko, (2009) PPP have constituted a growing movement worldwide for the past decades. Countries have been seeking private partners to finance, manage and maintain infrastructure serving public purposes in a growing range of areas. As discussed by the public governance and territory development public management committee, PPP is becoming an increasingly important tool for delivering public services both with regards to infrastructure assets such as bridges, roads and the likes and more complex assets such prisons and utilities. This presents the public sector with particular challenges that need to be met with prudent institutional answers. PPP can be viewed in a broad way as covering most interactions between the private and the public sectors and in a narrower way as focusing on particular sets of risk-sharing and financial relationships. Awodele (2012) however opined that although private sector participation is increasingly invoked in the context of developing countries Nigeria inclusive, various problems have been encountered in this regard. Research on PPP has shown that, lack of skill in determining, assessing, valuing, and transferring risk factors by government has resulted in some highly publicized poor outcomes. Although contractual arrangements may transfer initial risks in financing, construction, and

operating cost to the private partner, longer-term outcomes reveal secured private profits while the public bears the losses (Hood and Neil, 2002; Quiggin 2002). While most researches have assessed different risk associated with various PPP procured infrastructures around the world (Awodele, 2012; Raftery, 1994; Raftery *et al.*, 1998; Ramcharran, 1998; Li *et al.*, 1999., Abdul-Aziz, 2001) not much can be said as to the risk associated with PPP procured housing projects. Thus, this research becomes imperative to assess the risks and proffer possible solution to the risks involved in housing projects using PPP system in Lagos, Nigeria.

LITERATURE REVIEW

Concepts of Public Private Partnerships System

Public Private Partnership (PPP) has been defined as a contractual arrangement which is formed between public and private sector partners and which involves the private sector in the development, financing, ownership and or operation of a public facility or service (Egbewole 2011; Amr, 2008). Egbewole (2011) further explains that PPP refers to a form of co-operation between public authorities and the private sector to finance, construct, renovate, manage, operate or maintain an infrastructure or service. PPP also involves some form of risk sharing between the public and the private sector for providing the infrastructure of service.

Oyewobi *et al.* (2012) opined that the concept of PPP is not entirely new in infrastructure development and according to Awodele, Ogunlana and Motawa (2010) the developments on PPP procurement frameworks are traceable to UK government that pioneered its use through the Private Finance Initiative (PFI). PPP utilization in infrastructure development has taken a global phenomenon and most developed and developing countries have resulted in using this concept. PPP has been considered and favoured as the way out for Nigeria to meet her infrastructure deficit. Many national economies are confronted with infrastructure investment needs. To meet the needs PPP has become an alternative to traditional public procurement. Thus, finding the optimal risk allocation is of high importance for a PPP projects' success.

Public Private Partnership as Emerging Housing Delivery System

PPP has been accomplished for delivering of housing in many developed and developing countries (Payne, 1999). In PPP delivered project, even though the private developer is likely to execute all development tasks, the public sectors may take on the role of the regulator, as well as an enabler, who takes the responsibility of providing the enabling environment for the private partner to step in. The public also act as a moderator who balances the market incentives with community interests and as a facilitator who takes the responsibility of assisting in project completion in addition to reducing the developer's risks (Sengupta, 2006).

In South Africa, Bulgaria and Russia a variety of forms of facilitation are included in their housing projects procured through PPP (Dewar, 1999). Under India's participatory development schemes, the public agency offers grounds of legal base, favourable policy environment, development guidelines and even loans (Adusumilli, 1999). In Canada, the facilitation is by way of permitting design plasticity in terms of, for example, permitted height, density, site construction and open space, in addition to reshuffling the approval process. Nonetheless, partnership is a significant means of provision, which tied different styles in different socioeconomic context to generate synergies for well-organized and reasonable housing provision. Partnerships may also be seen to link the ideological divide amid the promoters of the free market system and those of state intervention by allowing the participation of both in addition to community actors (Jones and Pisa, 2000).

Risk in Public Private Partnership Projects

Risk can be seen as an inseparable part of construction project and all construction projects are risk-prone (Byrne, 2009; Wang *et al.*, 2007). Risk is defined as a hazard, or chance of a bad consequences, loss, exposure to mischance, exposing oneself to loss (Tembo *et al.*, 2014). This risk must be properly allocated in order to ensure proper management for successful delivery of the project. According to Peter *et al.* (2014) risk allocation entails assigning management responsibility and accountability for risk. Ijigah *et al.*, (2015) opined that in construction, the question of who bears the risks should depend on the impact of the risk on the overall project duration. Risk in construction has been described as the exposure of construction activities to economic loss, due to unforeseen events or foreseen events for which uncertainty was not properly accommodated (Chinyio and Fergusson, 2003). Whenever a construction project is embarked upon, there are some risk elements inherent in it, such are physical risk, environmental risk, logistics risk, financial risk, legal risk and political risk among others (Ijigah *et al.*, 2013).

On PPP procured projects, Xenidis and Angelides (2005) opined that given the complexity, size, time frame of concession contracts, and the multitude of stakeholders involved, the delivery methods of PPP projects have been judged to be full of risks. Review of related literatures (Akintoye *et al.*, 1998; Li *et al.*, 2005; Ayeni, 2005; Ibrahim and Price, 2006; Xenidis and Angelides, 2005; Ibrahim *et al.*, 2006), showed quite a number of risks associated with PPP procured projects. Understanding and addressing these risks early is important for both parties in PPP. Promoter would invest in a project only if the risks in the project are less than the reward which the project fetches. PPP projects carry several risks that are unique to this type of delivery system in addition to the risks associated with more traditional assignments.

Some of the major risks in PPP are: Political risk; Construction risk; Legal risk; Economic risk; Operation risk; Market risk; Project finance risk; Relationship risk; Natural risk (Abd-Karim, 2011; Dikmen and Birgonul, 2006).

Political risk: the project company and the lenders face the risk that the project execution may be negatively affected by the acts of the contracting authority (government), other agency of the government or the host country's legislature. The following are also referred to as political risk: change in law; government reliability; poor public decision making process; delay in project approval and permits; unstable government; inconsistency in government policies

Construction risk: the construction risks are essentially a bundle of individual risk factors that adversely affect the construction of a project within the time frame and cost projected and at the standard specified for the facility. Construction risk are associated with PPP project, more traditional construction project and the simpler forms of design/ building projects. They include: land acquisition; cost overruns; availability of finance; construction time delay; late design changes; project delay; competition risk; quality risk; poor quality of workmanship; availability of appropriate labour and material; contractor failure.

Legal risk: legal risk is mainly due to government regulations. Some of the legal risks that a PPP project can face are related to: change in tax regulation; corruption and lack of respect for law; import/ export restriction; rate of returns restriction; legislation change

Economic risk: this is due to poor financial market and inflation. Some of the economic risks that a PPP project can face are related to: poor financial market; interest rate volatility; inflation rate volatility; foreign exchange and convertibility

Operation Risk: some of the risks that we may face in a PPP project apply also when we are providing operations and maintenance. Except for termination of concession by the concession company, this risks flow directly to the concession company. Some of the risks and action available to the concession company include: operation cost overrun; operation financial risk; operator default; quality of operation; technology risk; waste of material.

Market and Revenue Risk: revenue risk is the uncertainty in relation to the revenue that a project would actually generate. The market and revenue risks that the PPP project may face can be grouped into the three: insufficient income from fares or tolls; insufficient income from other operations; insufficient traffic.

Financial Risk: financial risk can either be exchange rate risk or interest rate risk. Where the exchange rate risk relates to the possibility that changes in foreign exchange rates alter the exchange value of cash flows from the project. The interest rate risk relates to the force the project to bear additional financing costs. This risk may be significant in infrastructure projects

given the usually large sums borrowed and the long duration of projects, with some loan extending over a period of several years, loans are often given at a fixed rate of interest.

Relationship Risk: it is mainly due to organization, coordination, responsibilities and commitment. The significant risk is different working method. This risk factor may increase the transaction cost or dispute because of improper organization and coordination.

Natural Risk: these risks are regarding the event that are outside the control of any party and cannot be reasonably prevented by the concerned party. These risks generally arise due to causes extraneous to the project. The defining of natural event includes: force majeure; environment; weather. Force majeure events comprises of all events that can be attributed to natural conditions or acts of god, such as earthquake, floods, cyclones and typhoons. These risks should be shared equally among the parties (Abd-Karim, 2011; Dikmen and Birgonul, 2006).

Awodele (2012) opined that, due to the newness of PPPs in Nigeria, knowledge of these risk factors on the part of the stakeholders (particularly internal stakeholders who handle the day-to-day running of the project) is lacking. Thus it is important to identify the likely problems that may occur during the delivery of public housing system through PPP.

RESEARCH METHODOLOGY

This study aimed at assessing the risk involved in housing project procured using PPP system of procurement in Nigeria with a view of reducing these risks and providing better housing delivery in the process. The data for the study were collected with the use of questionnaires administered to selected professionals (Architects, Builders, Engineers and Quantity surveyors) in contracting firms, consulting firms and government parastatals in Lagos State, Nigeria. The questionnaire was structured into three sections. Section A contains nine (9) questions which were used to elicit background information about the respondents and their organization. Section B elicit information on the probability of occurrence of identified risks from the literature. Section C presented the various mitigation measures that can be employed to mitigate against the identified risks.

Table 1 shows the result obtained from the reliability test conducted using Cronbach α on the research instrument. The Cronbach's α -value ranges from 0.842 and 0.961. These values were considered very high as they were very close to 1.00. This is in line with the assertion of Creswell (2012) that the research instrument is reliable the more the Cronbach's α -value tends towards 1.0. Consequently, the questionnaire used for this study is significantly reliable.

Table 1: Test of Reliability for Measuring Scale

Scale of Measure	Cronbach's α - value
Likelihood of Occurrence of Risks	0.882
Criticality of Impact of Risks	0.842
Effectiveness of Risk Mitigating Measures	0.961

A total of 98 questionnaires were randomly distributed and 63 were retrieved and ascertained fit for analysis. This represents about 64% response rate, which is far above the usual response rate of 20-30% for questionnaire surveys in construction management studies, as suggested by Akintoye (2000). Data gathered were analyzed using frequency, percentage and Mean Item score (MIS).

FINDINGS AND DISCUSSIONS

General information of Respondents

Result shows that majority of the respondents sampled were Quantity surveyors and Architects with 37% and 30% respectively, while Engineers and builders were the least represented with 21% and 12% respectively. Also the average years of experience of the respondents is 11 years. This vast years of experience of the respondents ultimately affects their involvement in PPP projects as 88.89% have been involved in construction projects procured through PPP while only 11.11% have not. Thus making the respondents adequately equipped to provide adequate answers to the research questions of the study.

Critical Risk associated with PPP procured housing projects in Nigeria

Table 2 shows the critical risk associated with PPP procured housing projects in Nigeria, and their probability of occurrence. From the table it is evident the most critical risk for housing projects is force majeure with a MIS of 3.86. However the probability of this risk occurring is not certain as it ranked 41 in terms of probability of occurrence with a MIS of 2.89. This is understandable as force majeure which comprises of all events that can be attributed to natural conditions or acts of God, such as earthquake, floods, cyclones and typhoons is hardly evident in this part of the world.

Also unstable government, construction failure, construction cost overrun, land acquisition issues and financiers unwillingness to take high risk, are risk that when they occur can prove critical to the success of such PPP projects as these ranked closely after force majeure with MIS of 3.73, 3.67, 3.60, 3.54 and 3.54 respectively. These factors also have a MIS well above average of 2.50 in terms of the probability of occurrence, which means that not only

are they critical and can adversely affect PPP procured housing projects, they also occur presently within the country.

In similar vein, poor quality of workmanship, inadequate experience of both parties in PPP related projects, delay in project approval and permits, availability of finance and weather condition cannot be overlooked as they are seen as critical risk that if not checked, can affect the project adversely. It is also evident that these risk factors have high probability of occurrence except inadequate experience of both parties in PPP related projects and weather condition which ranked 30th and 34th with a MIS of 3.17 and 3.08 respectively. This implies that while there is the probability of these two risk factors occurring, it is not as high as compared to the other critical risk factors earlier identified. However poor quality of workmanship and availability of finance which were identified among the top 10 critical factors happen to be the two main factors with the highest probability of occurrence with a MIS of 4.03 and 4.02 respectively. Thus, these risk factors should be checked as they are both critical and their likely hood of occurrence is high.

The least critical risk associated with housing projects procured through PPP are tariff change, high bidding cost and competition risk with a MIS of 2.83, 2.73 and 2.71 respectively. It is also evident from the table that these risks do not have high probability of occurrence.

Table 2. Critical Risk associated with PPP procured housing projects

Risks	Prob. of Occurrence		Critical Risk	
	MIS	Rank	MIS	Rank
Poor quality of workmanship	4.03	1	3.51	7
Availability of finance	4.02	2	3.48	10
Construction time delay	3.90	3	3.28	18
Change in law	3.87	4	3.32	14
Poor financial market	3.83	5	3.02	36
Project delay	3.83	5	3.28	18
Construction cost overrun	3.79	7	3.60	4
Delay in project approval and permits	3.75	8	3.5	9
Availability of appropriate labour and material	3.63	9	3.11	29
Land acquisition	3.62	10	3.54	5
Fluctuation of material cost by private	3.59	11	3.38	12
Inconsistence in government policies	3.57	12	2.90	42
Quality risk	3.54	13	3.24	25
Unstable government	3.52	14	3.73	2
Operation financial risk	3.43	15	3.27	20

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Financiers unwilling to take high risk	3.40	16	3.54	5	
Organization and coordination risk	3.38	17	3.32	14	
Operation cost overrun	3.35	18	3.27	20	
Government reliability	3.33	19	2.98	38	
Foreign exchange and convertibility	3.32	20	3.03	35	
Quality of operation	3.32	20	3.21	26	
Inadequate negotiation period prior to initiation	3.30	22	3.37	13	
Construction failure	3.29	23	3.67	3	
Fluctuation of material cost by Government	3.27	24	3.11	29	
Competition risk	3.24	25	2.71	46	
Late design change	3.22	26	3.06	33	
Technology risk	3.19	27	2.86	45	
Interest rate volatility	3.19	27	3.14	27	
Import/export restriction	3.19	27	2.95	40	
Inadequate distribution of responsibility and risk	3.17	30	3.25	24	
Delay in financial closure	3.17	30	3.32	14	
Corruption and lack of respect for law	3.17	30	3.30	17	
Inadequate experience in PPP	3.14	33	3.51	7	
Weather condition	3.08	34	3.48	10	
Market demand	3.08	34	2.97	39	
Legislation change	3.05	36	3.27	20	
Operator default	3.00	37	3.27	20	
Waste of material	2.98	38	3.11	29	
Different working method	2.90	39	3.00	37	
Tariff change	2.90	39	2.83	44	
Force majeure	2.89	41	3.86	1	
Change in tax regulation	2.89	41	3.07	32	
Poor public decision making process	2.87	43	3.05	34	
Rate of returns restriction	2.86	44	2.92	41	
High finance cost	2.79	45	3.14	27	
High bidding cost	2.75	46	2.73	45	

Effective Mitigation Measures

Table 3 shows the possible mitigation measures needed to help tackle the identified risk in housing projects procured through PPP. Effective management capabilities and ensuring affordability is considered, were ranked as the two most important measures with a MIS of 3.76 and 3.71 respectively. Also considering commercial viability and strategic justification is equally

necessary if the expected result is to be achieved in the delivery of housing projects through PPP. A cursory look at the table however shows that all the identified measures are important as they all have a MIS of well above average of 2.50. This implies that for effective delivery of housing projects through the PPP route, then all the identified measures must be considered.

Table 3. Mitigation measures

Mitigation Measure	MIS	Rank
Effective Management capabilities	3.76	1
Ensuring affordability	3.71	2
Commercial viability	3.63	3
Strategic justification	3.60	4
Allowance for adequate risk sharing	3.57	5
Ensuring value for money	3.57	5
Contractual structures and terms	3.54	7
Payment mechanism	3.54	7
Calls for expression of interest	3.49	8
Properly determining the expected cost from inception	3.38	10
Proper definition of project scope	3.16	11

Discussion of Findings

Findings from this study reveals that the most critical risk in housing projects procured through PPP route is force majeure, however it is not a common occurrence in Nigeria. Also unstable government, construction failure, construction cost overrun, land acquisition issues, financiers unwillingness to take high risk, poor quality of workmanship, availability of finance and weather condition, are critical risk that can affect the delivery of housing projects through the use of PPP in Nigeria, but with varying degree of occurrence in the Nigeria construction industry. However, poor quality of workmanship and availability of finance are the two most common risk presently in PPP procured projects in Nigeria, and unfortunately happens to be critical risk, hence, they should be checked.

Findings of this research is in line with Ijigah *et al.*, (2015) where force majeure (Damage by fire, flood and earthquake) was identified as one of the critical risk associated with construction projects in Nigeria alongside inadequate cash flow. Findings of the research also agrees with Awodele (2012) research were unstable government and land acquisitions were part of the identified critical risk associated to public markets procured through the PPP route. These results also further corroborate previous findings of Zhang *et al.*, (1998) and Li *et al.*, (2005) in Hong Kong and the UK respectively.

The study further suggest that effective management capabilities, ensuring affordability, considering commercial viability, strategic justification and creating allowance of adequate risk sharing are necessary measures in mitigating these risks. This is in line with Ijigah *et al.*, (2015) findings that effective management is needed for allocation of risk and subsequent mitigation of same. Tembo *et al.*, (2014) submitted that for risks to be allocated, they first have to be identified, analyzed and responded to. It is in the event of response that risks are allocated. Evidently risk allocation is the assignment of management responsibility (Wang *et al.*, 2007 and Chan *et al.*, 2011).

CONCLUSION AND RECOMMENDATIONS

This study set out to assess the risk involved in housing project procured using PPP system of procurement in Nigeria. Using a survey method with construction professional in contracting firms, consulting firms and government parastatals sampled, the study has been able to identify the critical risk associated with housing project procured using PPP and has also proffer possible mitigation measures.

The study revealed that force majeure, unstable government, construction failure, construction cost overrun, land acquisition issues, financier's unwillingness to take high risk, poor quality of workmanship, availability of finance and weather condition but with varying degree of occurrence in the Nigeria construction industry. Also, of all these critical risks, poor quality of workmanship and availability of finance are the two most common risk common in PPP procured projects in Nigeria.

The study further recommends that effective management should be considered and affordability of these houses by the end users should be considered from the onset. Also proper awareness of both the public and private sector on the inherent risk in PPP procurement system is necessary and this can be done through seminars, conferences and workshops organized by various construction bodies and procurement units across the country.

AREAS FOR FURTHER RESEARCH

Having revealed risks with critical impacts on housing project procured using PPP system of procurement in Nigeria and effective risk mitigation measure for them. It is important that further research be conducted on other social projects like educational buildings and hospital buildings procure using PPP system. This will give a broad understanding of risks factors that are peculiar to social facilities in the country. Other research efforts can also be geared towards economic projects so as to compare findings from these two types of projects.

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