CRITICAL SUCCESS FACTORS FOR PUBLIC PRIVATE PARTNERSHIPS IN THE WATER SECTOR IN KENYA

Albert Njeru Gatuta Njeru
Department of Public Policy and Administration, Kenyatta University, Kenya.

James Maingi
Department of Public Policy and Administration, Kenyatta University, Kenya

International Academic Journal of Arts and Humanities (IAJAH) | ISSN 2520-4688

Received: 12th May 2021

Published: 19th May 2021

Full Length Research

Available Online at: http://iajournals.org/articles/iajah_v1_i2_239_261.pdf

Citation: Njeru, A. N. G., Maingi, J. (2021). Critical success factors for public private partnerships in the water sector in Kenya. *International Academic Journal of Arts and Humanities, 1*(2), 239-261

ABSTRACT

Public-private partnerships (PPPs) are essential because they facilitate the implementation of infrastructure projects in developing countries. The benefits of these projects are greater in developing countries where public funding for infrastructure development cannot meet demand. The Kenyan government, through the PPP Unit, has undertaken a number of PPP projects with the aim of reducing infrastructure gaps. Presently, the government has 47 ongoing PPP projects in different ministries. The challenge for the Ministry of Environment, Water and Natural Resources is that although the primary legislation sets the legal framework for PPP transactions, there is no per-sector PPP policy that coordinates PPP process, human resource capacity, leadership and resources. The absence of a per-sector PPP policy framework that meets the needs the ministry motivated this research. The general objective of the study was to develop a framework for successful PPP model in water and sanitation in Kenya. Specific objectives were: To identify key factors for consideration in adopting a PPP project; to determine the factors that affect success levels of PPP projects; to identify key issues for consideration in the choice of a partner; and to investigate the selection criteria for the best form of partnership. The study used a descriptive design to develop and test hypothesis on the determinants of success in PPP projects in water and sanitation. Exploratory research design complemented the descriptive approach in establishing relationships among the determinants of success in PPP projects. A mixed method approach was used to collect data from a sample of 16 employees and director at the PPP Unit Secretariat. Unstructured interviews and structured questionnaires were used for data collection. The responses were entered into Hyper Research and Statistical Package for Social Sciences (SPSS) software programs for qualitative and quantitative analysis respectively. Qualitative analysis produces themes on the determinants of PPP success while quantitative analysis provided descriptive and inferential statistics to describe the relationships between variables on the determinants of PPP success. The findings of the study revealed that implementation of public-private partnerships in water sector was affected by various factors such as operating, revenue, technical, construction, regulatory, project, force majeure and environmental risk. Also, from the regression model, the findings revealed that coefficient of adjusted R2 was 0.795 which translates to 79.5%. This explains that 79.5% changes of public private partnerships can be explained the following variables; factors to consider when adopting PPP projects, success factors for PPP projects, factors for selection of PPP project and selection criteria for best. The study concluded that implementation of public-private partnerships in water projects is affected by factors such as risks involved, government control, procurement process, political stability, manager competences among others which need to be addressed. The study recommends that the formation of governance structures of the partnerships must be done according to the framework provided with strict conformity with the rules and regulations as set out by the regulatory authority so that proper checks and balances can be instituted to

take cognizance of the interests of the parties involved in the formation of PPPs.

INTRODUCTION

In the water sector of developing countries, PPP is on the one hand due to governments not having sufficient financial resources to undertake the large-scale investments that are required for water supply projects (Diba, 2012) and on the other because of the prospects of improved efficiency, cost effectiveness and innovation in water services (Kayaga, 2008).

PPP in the water sector comes in two broad forms (Ameyaw & Chan, 2016), namely, service-based models (utility management) that attract private sector's skills and management expertise to optimize costs and operational efficiency in existing water systems, and financed-based approaches that use private sector's innovative skills and capital to develop new water infrastructure assets with little or no public financial commitments. Between 1990 and 2005, private investment in excess of US$50 billion was committed to over 380 water supply projects in low- and middle-income countries (Marin & Izaguirre, 2006). By 2012, the level of investment reached over US$69 billion in 814 projects in 63 countries. The exact form of PPP for a water supply project is shaped by the host country's water sector characteristics and social, economic and political conditions (Ménard & Peeroo, 2011).

A global overview of PPP projects by Price water house Coopers (2012) showed an increase in PPP deal volumes from US $44 million in 2009 to US $66 million in 2011. This growth represents an increase in the number of closed deals from 150 to 170 deals. PPP margins also remained high at 270bp in 2011 compared to 150bp in 2008. The highest PPP volume was notably in Western Europe whose total deal count was 70 deals valued at US$ 20,000 million. This region was followed by North America and Asia Pacific. Africa and the Middle East had the lowest PPP market volumes with less than 10 deal counts worth $US 2,000 million (PricewaterhouseCoopers, 2012).

Within East Africa, the East African Chamber of Commerce, Industry and Agriculture (EACCIA) established a project for Project Advisory Units (PAUs) supported by ACP Business Climate. These PAUs were created because countries observed that there was a need to build the capacity of private sector in infrastructure development and PPP participation. The Project Advisory Unit Network (PAUN) was also created to provide network support to PAUs in East African Community (EAC) member states. At the regional level, PPPs projects were introduced for infrastructure development. Examples of PPP projects are the Railways Concessioning in Kenya, Off-grid lighting in Rwanda, Bugoye Hydropower plant in Uganda and Chumbe Island in Zanzibar (BizClim, 2012).

Presently, all of the EAC member states have adopted PPP projects for infrastructure development. The most active sectors for these PPP projects have been energy, telecommunications, water and transport. Private participation has been greatest in energy projects because each member state needs considerable increase in their ability to generate electricity to support economic growth. The progress for each member state has been

different. Kenya, Uganda, Rwanda and Tanzania have progressed relatively well in PPP infrastructure development. However, Zanzibar and Burundi have some way to go. Nevertheless, the countries have developed PPP legislation to facilitate infrastructure development. Some features of the PPP legal framework are: definition of contractual agreement types, administrative coordination, responsibilities and roles of PPP authorities, mandate for PPP units, provisions for financial support for PPP transactions, tariff rules, transaction terms, standardized PPP agreements and a dispute resolution process. Despite this legislation, PPP progress is mainly affected by lack of capacity in the local private sector to play a full partnership role in PPPs. As a result, PPP PAUN is needed to build capacity and to raise awareness in the private sector (BizClim, 2012).

The Kenyan government has been committed to supporting PPP infrastructural projects in the country since 1996. This commitment has seen the government attract diverse private investments into the infrastructure sectors such as water, sewerage and transport (PPP Unit Kenya 2013). To support this commitment, the Kenyan government implemented institutional and regulatory frameworks for PPPs in infrastructure development. The National Treasury set up PPP Unit as guided by the Public Procurement Disposal institutional framework in 2009. The PPP Unit is led by a Director. As shown in figure 1, experts to the PPP fulfill functional roles including financial, legal, procurement, technical and external affairs.

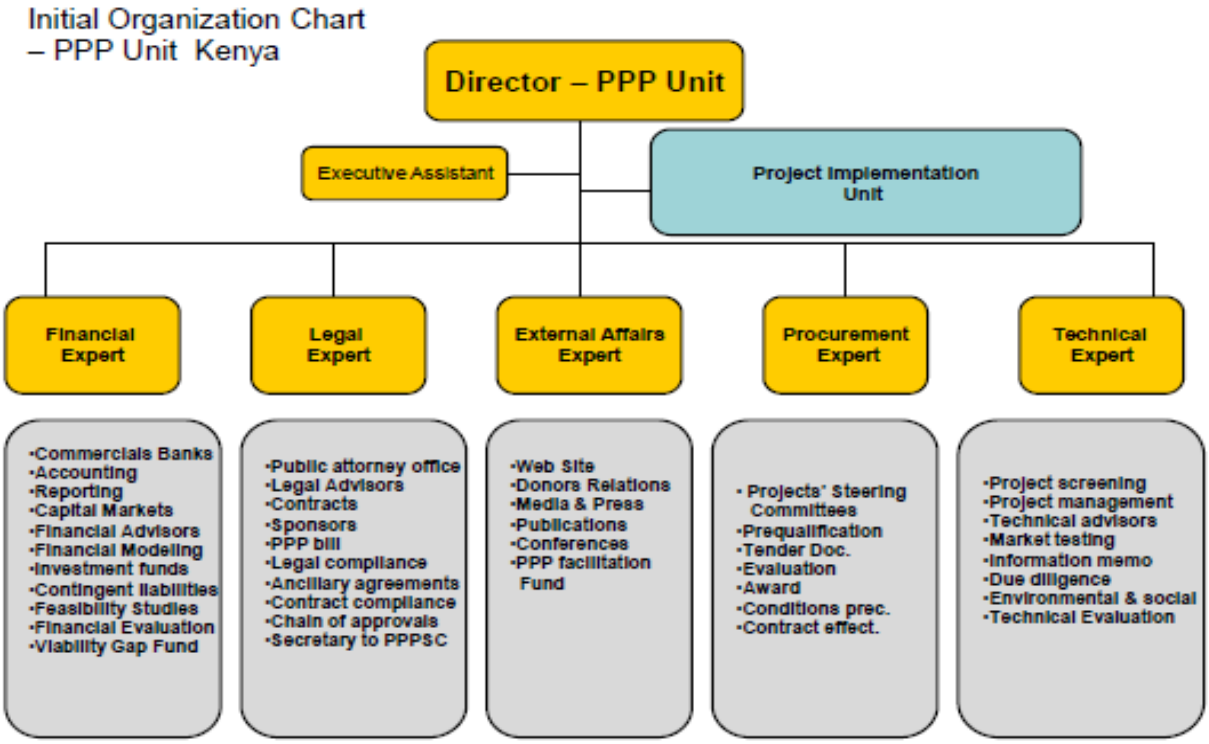


Figure 1.1 Kenya PPP Unit (Kamau, 2012).

A regulatory framework for PPPs was recommended in 2010 which led to the approval of a PPP policy statement in 2011. In 2012, the Parliament approved the PPP Bill which received Presidential Assent to become the PPP Act in January 2013 (Kamau, 2013). The PPP Act

provides a legal framework for the development of PPPs for infrastructure development. The Act enables the government to approach PPPs as long-term programs rather than independent projects. The Cabinet and the PPP Committee ensure that PPPs comply with the PPP Act (PPP Unit Kenya 2013).

The Kenyan Government, through the PPP Unit, has undertaken a number of PPP projects with the aim of reducing infrastructure gaps. The government has been committed to improving the environment so as to increase private sector participation and create a conducive climate for PPP investment (Kamau, 2012). Through this commitment, the government was been successful in carrying out historical PPP projects such as the Mtwapa Bridge Concessions, Nyali Bridges Concession of 1959, Iberafrica, the Jomo Kenyatta International Airport (JKIA) Cargo terminal in 1998, the Port of Mombasa Grain Terminal in 1998, the Malindi water utility management contract in 1999, the Tsavo/Kipevu IPP project in 2000, Orpower-Olkaria III geothermal plant in 2000-2008, Mumias 25MW cogeneration and the Rabai IPP 90MW plant in 2009 (PPP Unit Kenya 2013).

Presently, the Kenyan government has 47 ongoing PPP projects. These projects include the construction of the second Nyali bridge; the maintenance of the Nairobi-Thika Road; dualing of the Mombasa-Nairobi highway; operation and maintenance of the Nairobi Southern bypass; construction of a transit hotel at the JKIA; rehabilitation of the Nairobi Commuter Railway; development of the Kisumu Port into a commercial lake port; the Lamu port development project; construction of a sanitary field for Mombasa Solid Waste Management, construction of Kenyatta University hostels, development of 4-tier National Data Center; development of Turkwel downstream irrigation; ICT services for the Kenyatta National Hospital; Nandi Forest Multipurpose dam construction, National Police Housing, Prison Housing, Kenya Flying School and development of Moi University Students Hostels among others (PPP Unit Kenya 2013).

A challenge for the Kenyan government is that its infrastructure needs are higher than funding from the government. According to Kamau (2012), the total infrastructure needs for energy, roads, water and sanitation, railways, local government, housing information and communication technology (ICT) and Lamu Transport Corridor is US $62,176 million. However, funding from the Kenyan government for 2012-2020 (9 percent of national growth domestic product) is only US $25,000 million. This means there is a funding gap of US $37,000 million. Kenya is keen on forming partnerships with the private sector to obtain new sources of investment capital, utilize private sector efficiencies and reduce government sovereign borrowings.

Developing a conducive environment for PPPs (such as a strong contract law, regulatory framework and PPP policy) is an area that has to be monitored and addressed. A past study carried out by the World Bank's Private Participation Infrastructure Advisory Facility (PPIAF) in 2007 pointed out that Kenya did not have an enabling legal framework. As a result, the Kenyan government embarked on an effort to develop a comprehensive PPP framework following the World Bank report. The government promulgated regulations in 2009 resulting in the modification of the Public Procurement and Disposal Act of 2005. The

regulations identified the five types of PPP agreements and contained features such as a five-year limit on management contracts, 15-year limit on a lease, 30-year limit on a concession, a 30-year limit on Build-Own-Transfer scheme and unlimited time for Build-Own-Operate. The government further established a PPP Steering Committee to drive PPP success and provide oversight of PPP project procurement in line ministries. The Ministry of Finance also set up a fully functional PPP Secretariat to support line ministries in PPP preparation and implementation (BizClim, 2012).

Statement of the Problem

Against this background, and as part of an ongoing research into risk allocation in PPP water supply contracts in developing countries (Ameyaw & Chan, 2013), the outcome of a Delphi survey of industry practitioners' opinions of success factors for the implementation of PPP water supply contracts is reported. The specific objectives are to identify and then evaluate the critical factors that lead to a successful implementation of PPP water supply projects, and present a predictive tool to assist public and private participants to evaluate the possibility of a successful implementation of a project, given a set of CSFs. The Ministry of Environment, Water and Natural Resources is mandated to protect, monitor, conserve and to manage the country's natural and environmental resources. The challenge with achieving these goals is that the Kenyan government has to engage other pillars of society including the private sector and increase capacity for developing successful PPPs (World Economic Forum, 2008).

The main consideration for the Ministry is that the implementation of Kenya's PPP projects is characterized by success and failure. The success or failure of PPP projects is influenced by a variety of determinants. The International Bank for Reconstruction and Development (IBRD) (2009) posits that the success of a PPP depends on affordability, risk allocation and bank-ability. Other determinants for success are the project size, geography of the project, use of unproven technology and workforce issues. PPPs also hold potential risks such as high development costs, increased debt, political influence, lack of clear regulatory and legal frameworks for sustainable projects, and the complexity of managing long-term projects (World Bank, 2014).

It is important for host governments and private proponents to understand and give continual attention to the factors affecting success of water projects. Thus, knowledge of relevant success factors enable optimal allocation of resources (Kavishe & Chileshe, 2019) and channeling of good behaviours towards implementing appropriate policies (Ahadzie, 2008). The study also seeks to provide a cleaner understanding of the latent (or principal) success factors and their degree of criticality for success of these projects. The ability to predict a project's likelihood of success would enable public-private participants to avoid risky projects and to prioritize which factors significantly contribute to a successful project implementation. Strategies to address project success are best exploited at the development phase of a project (Li et al., 2005). Therefore, this research explored to determine critical success factors for public private partnerships in the water sector in Kenya.

Objective of the Study

The study was guided by the following research objectives;

i. To identify key factors for consideration in adopting a PPP project.
ii. To determine the factors that affect success levels of PPP projects.
iii. To identify key issues for consideration in the choice of a partner.
iv. To investigate the selection criteria for the best form of partnership

LITERATURE REVIEW

Factors for Consideration when Adopting PPP Projects

Studies established that there were a number of factors to consider when adopting PPP project. These factors include the duration of partnership, the funding method, the role of economic operators, risks involved, government control, procurement process and feasibility. Ong'olo (2006) conducted primary research on the development of PPPs and their regulatory policies in Kenya. Their study analyzed the status of partnerships, compared the approaches to PPP design and defined the best practices for developing PPP frameworks. It used data collected from desk research and interviews with private and public sector consultants. The findings revealed that there was euphoria over PPP arrangements and that the factors which determined a successful PPP project were the type of contractual agreement, the contracting authority, the financial strength of the bidder, the price of the bids, the duration of the project and the risks for the private sector. The study concluded that there was a need to consider the following factors: an amendment to the current PPP legislation; minimum standards for PPP contracts; policies for packaging and controlling PPP projects; and the requirements for blending PPP frameworks for the privatization programs. The article provided useful insight into PPP arrangements but did not provide detailed analysis on the factors affecting the adoption of PPP projects.

Zou and Kumaraswamy (2009) posited that political stability, government control and a legal framework were important factors for consideration of PPP projects based on their application of game theory. The authors collected questionnaire data on the key life cycle stages for PPP projects. Using the game theory model, the study demonstrated how public sector players could set rules, timing, contracting and finances for PPP projects. The model incorporated a number of internal and external factors for PPP project consideration including political stability, government control, and the legal framework to determine the payoff for public sector players and the sustainability of PPP partnerships. The study concluded that there was need for more research on creating stable public-and-private sector relationships to improve the success of PPP projects. Its major drawback is that the study did not describe the factors for adopting PPP projects (government control, legal framework and political stability) in detail. Furthermore, the study did not discuss other consideration factors such as funding, procurement processes and risk management.

Akintoye et al. (2003) posited that risk was an important factor to consider when adopting PPP project. Their study on achieving best value for such projects established that the public sector should obtain value for money whereas the private sectors should be ready to assume the responsibility for the project risks. Qualitative data was collected from 68 interviews with private finance initiative (PFI) project participants (such as contractors, consultants, public sector clients and financial institutions) and case study of the projects. The results of the analysis revealed that the adoption of projects should be hinged on risk allocation, risk analysis and control of escalating project costs. The benefit of the study is that it confirms that risk management is an important consideration for adopting PPP projects. However, the study was only limited to one consideration.

The International Bank for Reconstruction and Development (IBRD) (2009) reiterated that the project size, complexity, workforce, technology, currency risk, environmental risks, financial viability and the demand risk were key factors which determined the adoption of PPP projects. This was based on a study on attraction of investors to PPPs in Africa. The study established that the factors influencing the adoption of PPP projects in Africa, which were obtained from the World Bank Private Participation in Infrastructure (PPI) database, were the following: the project size, complexity, workforce, technology, currency risk, environmental risks, financial viability and the demand risk. The article posited that private sector interest in PPP was created when projects were not too large for the bidder, used proven technology, were not too complex, had sufficient staff from the public, earned revenues in the local currency, had low environmental risks, had fewer demand fluctuations and were financially viable. IBRD (2009) concluded that the private sectors should implement project management principles to ensure effective communication, stakeholder participation, market confidence, supply capability and low transaction costs. They also recommended the use of advisers (technical, financial, legal and environmental advisors) and assessments to ensure proper public governance and the compatibility of the private sector interface. The strength of the article is that it provided comprehensive information on factors for PPP adoption, management and contract management.

Success Factors for PPP Projects

Li, Akintoye and Edwards (2005) conducted research on the critical success factors (CSFs) for PPPs and private finance initiatives (PFIs) in the United Kingdom's construction industry. The purpose of their study was to explain the reasons for the demand for PFI and PPPs and the success of these projects. It established that the reasons for this success were not clear and therefore sought to define the critical success factors for the success of PPP projects. The study used questionnaire surveys to collect data on successful PPP construction projects. The findings revealed that there were three key success factors: the financial market, risk allocation and the existence of a strong private consortium. Further qualitative analyses revealed that 18 critical success factors were necessary for the construction industry. These were categorized into project implementability, financial market, procurement, government guarantee and favorable economic conditions. The study concluded that the findings should encourage further policy development for PPPs and influence how partners engage in PFI

projects. Although the study was quite useful in describing the critical success factors for PPP projects, the major weakness was that the findings were limited to the UK construction industry. Nevertheless, the article drew great insight into a number of critical success factors for PPP projects.

Good governance was emphasized as a crucial CSF for PPPs in Indonesia. According to Abednego and Ogunlana (2006), good governance was important because it helped partners to allocate risks properly and reduce disputes which could affect the probability of a project's success. The purpose of the study was to discover the importance of good governance in PPP project success. The study posited that PPP projects needed good governance because the latter helped the partners to monitor and to oversee the strategic direction and decisions of PPP projects. Case study findings from an Indonesian toll way project showed that good governance played an important role in determining the success of the project. The findings confirmed that governance was an important CSF for PPP projects.

Cheung, Chan and Kajewski (2012) conducted a similar study on the CSFs for PPP projects in Hong Kong with comparison to the United Kingdom and Australia. The purpose of their study was to determine the factors which contributed to successful PPP projects in the three countries. Empirical questionnaire surveys were used for data collection to help determine the ranking of 18 factors for successful PPP projects. The findings showed that three of the top 5 CSFs for Hong Kong were ranked highly by the British and Australian respondents. These common CSFs were commitment of the private and public sector; the presence of a strong private consortium, appropriate allocation of risks. The findings were similar to Ismail and Ajija (2013) because they showed certain common factors irrespective of geographic locations. The findings were useful because they highlighted the most common and important CSFs which were applicable to different jurisdictions.

Chan et al. (2004) also provided similar insights into the CSFs for PPP projects in construction. The purpose of their study was to examine the critical factors for successful PPP projects in Hong Kong. They reviewed the development of PPP projects using questionnaire surveys sent to project participants. The findings showed that that the underlying CSFs for PPP projects were conflict resolution, resource sharing, clearly-defined responsibilities, progress monitoring and commitment to winning. The study also reported that there was a relationship between the CSFs and the partner's perception of their project's success. The study was beneficial because it identified CSFs for formulating effective strategies for improving performance and minimizing conflicts in construction PPPs.

Factors for Selecting a PPP Partner

Various studies presented different factors for selecting a PPP partner. Kumaraswamy and Anvuur (2008) evaluated the factors for selecting team members in PPP projects. The purpose of their study was to develop an integrated framework to guide the selection of teams in PPPs. The framework used Delphi methodology to develop a scoring system for selecting PPP teams. The scoring system revealed the eligibility for PPP teams were technical competence, sensitivity to sustainability performance and relational capacity (relationships

between team members). The study used these eligibility criteria to develop a mathematic performance score which added the weights of the team's technical competence, sustainability performance and relational capacity. In addition, findings from 21 experts showed high consensus on the suitability of the proposed framework for PPP team selection. The strength of the study was that it proposed a mathematical model for selecting team members in PPPs. The drawback was that the study did not describe how partners could quantify the eligibility criteria for the model.

Zhang (2005) provided criteria for selecting partners in PPPs. The purpose of the article was to discuss the selection of appropriate private sector partners in infrastructure development projects. It discussed a variety of selection criteria for private-sector partners based on global PPP practices. Data from structured questionnaire surveys was analyzed to determine the significance and ranking of the criteria. The findings revealed that the most vital criteria were (i) financial, (ii) technical, (iii) managerial, and (iv), safety and health. The study confirmed that the selection of private sector participants in PPP projects could be improved by using the ranked criteria. The strength of the study was that the criteria could be used to evaluate the suitability of private partners by the public sector. The drawback of the article was that it focused on selection criteria in Chinese PPPs rather than Kenyan PPPs.

Plummer (2002) emphasized the importance of competence when selecting private partners. This was based on an evaluation of partnerships in capacity building projects for municipalities. The evaluation revealed that a competent and experienced private partner was a key factor for partner selection. The study reiterated that competency was important because an experienced private partner would create an effective decision-making environment; motivate personnel to implement performance management systems; align personnel to customer-oriented approaches; develop alternative service delivery strategies for low-income communities; and ensure that the PPP projects were implemented in a sustainable manner. This competency characteristic was one of the main factors articulated in the author's discussion on principles for public-private partnerships.

Selection Criteria for Best Form of Partnerships

Hammami, Ruhashyankiko and Yehoue (2006) conducted research on the criteria for public-private partnerships. Their study hypothesized that governments which had heavy debt and large deficits were more likely to invest in PPP while those with large exogenous revenue were least likely to participate in PPP projects. Their research was an empirical evaluation of the determinants of two PPP arrangements (BOO and BOT). The dependent variable was the number of PP projects while the independent variables were government balance, total debt, population, inflation, money supply, corruption, legal system, PPP experience. The findings revealed strong correlations between number of PPO project, debt, government balance, population, real gross domestic product (GDP), corruption and PPP experience. The study concluded that the key determinants for PPP partnerships were sources of revenue, the political environment, market conditions, macro-economic policies, strength of legal institutions, prior experience with PPP projects and the structure of technology to support PPP participation. The strength of the study was that it considered a variety of factors for

selecting partners for PPP projects. It also used quantitative methods for analyzing data on PPP partner criteria. The major weakness is that the study did not reveal the importance of the finding by targeting gaps in secondary literature.

DeClerk, Demuelemeester and Herroelen (2012) also provided insight into the considerations of PPP partnerships. Their descriptive study reviewed 125 empirical literatures between 2004 and 2011from project management and construction management journals. The study also incorporated interview data from a government institution with experience in PPP projects. The findings from qualitative analysis showed that private sector players should consider the number of bidders, attractiveness of the PPP project, quality of the government's involvement, any corruption behaviors and the project portfolio of public and private PPP players. The study posited that these factors were important because they revealed the project's risks and areas for risk management The study concluded that PPPs should be planned beforehand to understand the perspective of the stakeholders. This planning reduces contractual risk associated with PPP arrangements and makes it easier for an interested partner to model game theory in the tendering and bidding phases of PPP contracting. The benefit of the research is that it cautions private sector players on risk management and contracting in PPP arrangements. The drawback is that it relied on qualitative research and did not use quantitative methods to collect management insights from PPP partners in the private and public sectors.

Bäckstrand (2006) conducted a study on stakeholder partnerships and the factors for selection. The premise of the article was that transnational partnerships raised questions about the accountability, effectiveness and legitimacy of networked governance. The purpose of the study was to advance a conceptual framework for legitimate partnerships. The study collected data from partnerships established during the World Summit on Sustainable Developments. The results showed that partnership networks were determined by global governance, diffusion of authority, effective leadership, accountability systems, reporting mechanisms, current multilateral agreements and measurable targets. The strength of the study is that it provided new insight into the factors influencing best form of partnership networks.

Clerk and Demuelemeester (2013) observed that experience was very important in PPP contracting. Their study used the game theoretical model to draw insight on the bargaining process and the relevance of national PPP units in supporting and promoting PPP projects. The game theoretical model applied a number of parameters including the project risk, investment learning rate, the experiential cost and learning rate, impact of lack of experience and the government's compensation level. The model was simulated using real-life data to show the bidding process, tendering strategies and the Nesh equilibrium for developing the most effective strategy for selecting private and public partners. The benefit of the study is that it used simulated data to demonstrate the importance of experience when selecting a partner for PPP projects. The drawback of the study is that the authors did not collect data from completed PPP projects to show how the experience of the partners caused the success or failure of the projects.

Theoretical Framework

Five theories were relevant to the study. These are the normative theory and public choice theory.

Normative Theory

The normative approach seeks to develop a greater understanding of the reasons for investing in PPP projects. Normative theory examines the application of moral beliefs and judgment in economic and public policy. According to Martimort & Pouyet (2006), normative theory focuses on the outcome of a public policy goal by expressing normative judgments and value on economic fairness. This theory is relevant to the study because it focuses on what a public policy for PPP investments should be. It helps researchers to develop insight into what PPP stakeholders would perceive as economic fairness when considering factors for PPP adoption and the selection of the best form of partnerships.

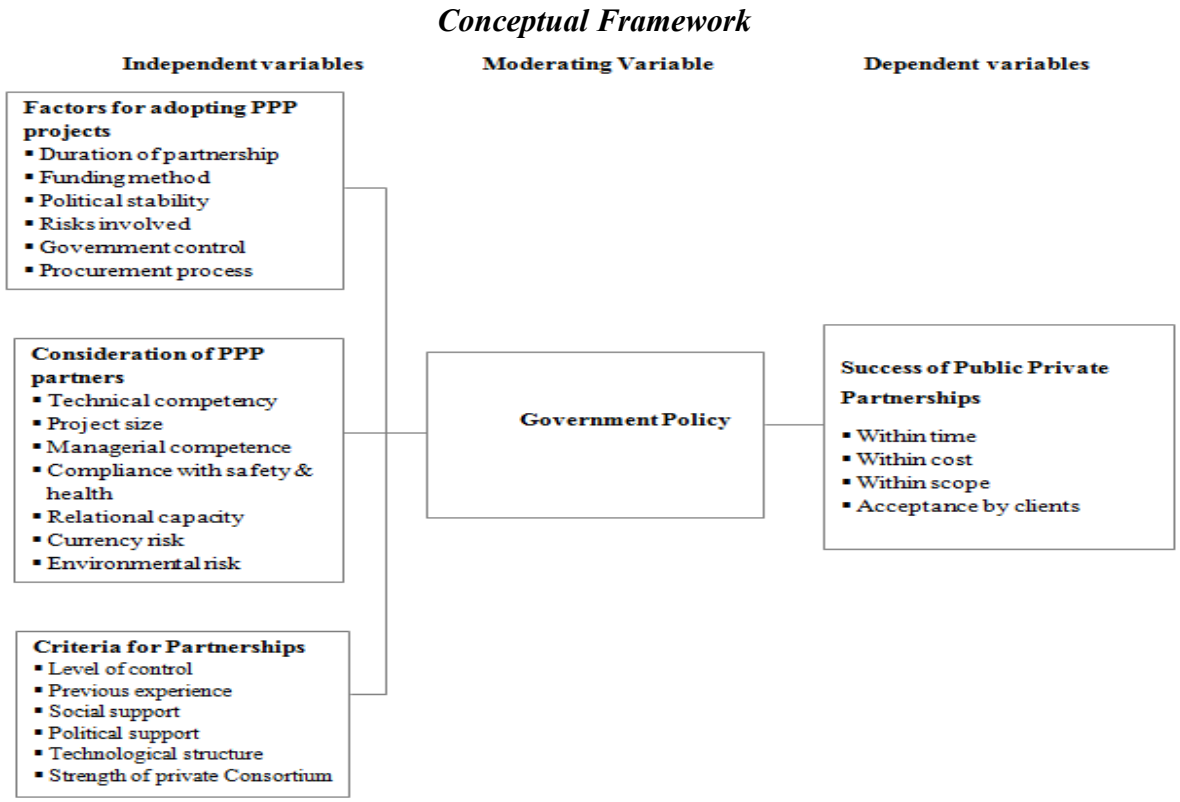
Positive theory

Positive economics refers to the branch of economics which focuses on describing or explaining phenomena and their casual relationships (Hands, 2009). Positive theory focuses on the description of economic phenomena and the cause-effect relationships of the phenomena. It is different from normative theory because the latter uses value judgments (Martimort & Pouyet, 2006). For instance, a positive approach towards PPP developments would focus on describing the factors for adopting PPP projects while a normative approach would apply value judgments when establishing criteria for the best form of private-public partnerships. The benefit of positive theory is that it provides a practical tool for implementing normative objectives. In the context of the study, the positive theory can be used to explain the behavior and the outcomes of PPPs with reference to the government's past experience with contracting, economies of transaction costs and public choice theory (Vining & Boardman, 2006).

Public Choice Theory

The public choice theory focuses on the interpretation for PPPs and their adoption. It was developed from research on public spending and taxation. The theory applies principles of economics to explain people's actions in decision-making and the market place (Mihaela, 2013). It posits that people's actions are guided by self-interests. This can be applied in PPPs to explain how stakeholders (public, politicians and policy makers) make decisions to protect their self-interests in the marketplace. The theory is useful to the study because it can reveal how politicians and economists can develop policies that reduce legislation which caters to particular interests leading to high government expenditures. Vining and Boardman (2006) concur that politicians can apply the public choice theory to provide the voters with information on the benefits of PPP projects. Gubler (2013) applied the public choice theory to the securities market and posited that the theory minimized the high costs of the private securities market. Their application of the theory showed that the private securities market could be expanded whilst satisfying the political requirements of the Securities and Exchange

Commission and policy-making processes. The study showed that public choice theory can be used to make the securities more appealing to the public and resolve conflicts with disgruntled negotiator.



RESEARCH METHODOLOGY

Descriptive research design was used in this study. Descriptive research was appropriate for this study because this research design is specific in nature and facilitates a general understanding and interpretation of the problem (Mugenda & Mugenda, 1999). The major purpose of descriptive design was to develop hypothesis and test them in order to create a picture of the research interest. This descriptive approach allowed the researcher to test hypothesis on the determinants of success in PPP projects in water and sanitation. Exploratory research design was used to complement the descriptive approach because the researcher sought to find relationships between the determinants of success in PPP projects. Mixed methods approach guided the descriptive and exploratory design because a combination of qualitative and quantitative data collection methods was used.

The population for the study comprised all the 16 employees and director at the Secretariat of the PPP Unit. The study adopted census sampling technique to select sample size. This means that the sample size for the study is 16. positivist philosophical model was used to help understand the research problem. A positivist approach is proposed because the study uses social science research to develop rules and laws for statistical analysis. The positivist philosophy was also used because the study focused on describing successful projects in

water and sanitation and the determinants for the project successes. A deductive research approach was used under this positivism philosophy.

The researcher used questionnaire and interview methods to collect data. The questionnaire had structured (close-ended) questions because these types of questions are easy to analyze in immediate form and are economical to use in terms of time and finance since the researcher did not have to labor to analyze diverse responses as observed in open-ended questions. The questionnaires were self-administered by the researcher through hand delivery. Every member of the secretariat was issued with a copy of the questionnaire and requested to return the completed form in five working days.

The data collected was both qualitative and quantitative in nature. Quantitative data was coded and analyzed using descriptive statistics (such as means and percentages) and inferential statistics such as regression and Pearson's correlation. The analyzed data was presented in the form of tables and figures. Qualitative data from the interviews were transcribed and entered into the Hyper Research software for computer-assisted analysis. The software helped the researcher to prepare, to code and analyze information from interview scripts, reports and documents. This information was presented in the form of themes.

RESEARCH FINDINGS AND DISCUSSIONS

Out of 16 sampled respondents that were served with the questionnaires, 15 filled in and returned the questionnaires. This translates to a response rate of 93.75% which was considered satisfactory for subsequent analysis. On gender of the Respondents, 9 (60%) of respondents were male, while 6 (40%) were female. Distribution of respondents by age showed that 13.3% of the respondents were aged between 25 and 29 years, 20.0% between age of 30 and 34 years, 26.7% between age of 35 and 39 years and 40% were aged 40 and above years. On work experience duration, a majority of respondents 46.7% had worked in PPP projects for a period of between 10 and 14 years, 33.3% had worked over 15 years, 13.3% had worked between 5 and 9 years while 6.7% and worked between 0 and 4 years.

Factors to Consider When Adopting PPP Projects

Table 1: Descriptive Statistics for Factors to Consider When Adopting PPP Projects

Statements	n	Min	Max	Mean	Std Dev	CoV
Duration of partnership	15	1.00	5.00	3.52	0.54	0.12
Government control	15	1.00	5.00	3.75	0.66	0.13
Procurement process	15	1.00	5.00	4.13	0.64	0.14
Funding method	15	1.00	5.00	3.31	0.58	0.15
Political stability	15	1.00	5.00	3.63	0.50	0.17
Project risk	15	1.00	5.00	4.15	0.52	0.14
Environmental risks	15	1.00	5.00	4.07	0.61	0.12
Average scores				**4.28**	**0.62**	**0.16**

Source: Field Data (2020)

On the factors to consider when adopting PPP projects, the study revealed that duration of partnership is important as indicated by a mean of 3.52 with standard deviation of 0.54, government control was found to have a mean of 3.75 with standard deviation of 0.66, procurement process was found to have a mean of 4.13 with standard deviation of 0.64, funding method was found to have a mean of 3.31 with standard deviation of 0.58, political stability was found to have a mean of 3.63 with standard deviation of 0.50, project risk was found to have a mean of 4.15 with standard deviation of 0.52 and environmental risks was found to have a mean of 4.07 with standard deviation of 0.60. This implies that these factors played a big role on performance of PPP in water sector. The findings agreed with the findings of Ong'olo (2006) which revealed that the duration of partnership, the funding method, the role of economic operators, risks involved, government control, procurement process and feasibility are critical factors to consider when adopting PPP projects. Also, Zou and Kumaraswamy (2009) posited that political stability, government control and a legal framework were important factors for consideration of PPP projects based on their application of game theory.

Additionally, one male Project Coordinator said that:

> *Before engaging in PPP the government and partners ensure that there is availability of project committees that are responsible for finances of the project to ensure effective funding of infrastructure. Government should establish tender committees to facilitate procurement process that are sustainable.*

On other hand, the Director of PPP unit noted that;

> *In PPP financing of infrastructure projects, partners must ensure that there are signed project documents. Infrastructure funding must be done in a competitive manner. Procurement procedures influence funding of PPP projects.*

Success Factors for PPP Projects

Table 2 Descriptive Statistics for Success Factors for PPP Projects

Statements	n	Min	Max	Mean	Std Dev	CoV
Financial market	15	1.00	5.00	4.22	0.61	0.12
Risk allocation	15	1.00	5.00	3.85	0.67	0.15
Good governance	15	1.00	5.00	4.33	0.59	0.17
Commitment of partners	15	1.00	5.00	4.52	0.55	0.14
Economic policy	15	1.00	5.00	3.87	0.60	0.16
Legal framework	15	1.00	5.00	4.09	0.53	0.12
Average scores				**4.10**	**0.60**	**0.14**

Source: Field Data (2020)

On the success factors to consider for PPP projects, the study revealed that financial market is important as indicated by a mean of 4.22 with standard deviation of 0.61, risk allocation was found to have a mean of 3.85 with standard deviation of 0.67, good governance was found to

have a mean of 4.33 with standard deviation of 0.59, commitment of partners was found to have a mean of 4.52 with standard deviation of 0.55, economic policy was found to have a mean of 3.87 with standard deviation of 0.60 and legal framework was found to have a mean of 4.09 with standard deviation of 0.53. This implies that these factors played a big role on performance of PPP in water sector. This agrees with Li, Akintoye and Edwards (2005) who established that the financial market, risk allocation and the existence of a strong private consortium are key success factor for PPP projects. Good governance was important because it helped partners to allocate risks properly and reduce disputes which could affect the probability of a project's success.

One of the interviewed project implementation team member noted that;

> *Favourable legal framework, sound economic policy, available financial markets, stakeholder support, appropriate risk allocation and risk sharing, commitment and responsibility of public and private sectors, strong private consortium, good governance, project technical feasibility, shared authority between public and private sectors, political support, social support affect the success PPP in water projects.*

Factors for Selecting a PPP Partner

Table 3 Descriptive Statistics for Factors for Selecting a PPP Partner

Statements	n	Min	Max	Mean	Std Dev	CoV
Technical competency	15	1.00	5.00	3.86	0.73	0.12
Relational capacity (relationships between team members)	15	1.00	5.00	3.74	0.62	0.13
Compliance with safety and health regulations	15	1.00	5.00	4.11	0.65	0.17
Financial capacity	15	1.00	5.00	3.97	0.62	0.14
Organization structure	15	1.00	5.00	3.93	0.69	0.16
Managerial competence	15	1.00	5.00	4.17	0.74	0.15
Average scores				**3.75**	**0.69**	**0.15**

Source: Field Data (2020)

On the factors to consider when selecting a PPP partner, the study revealed that technical competency is important as indicated by a mean of 3.86 with standard deviation of 0.73, relational capacity (relationships between team members) was found to have a mean of 3.74 with standard deviation of 0.62, compliance with safety and health regulations was found to have a mean of 4.11 with standard deviation of 0.65, financial capacity was found to have a mean of 3.97 with standard deviation of 0.62, organization structure was found to have a mean of 3.93 with standard deviation of 0.69 and managerial competence was found to have a mean of 4.17 with standard deviation of 0.74. This indicates that for a PPP project to be successful, a number of factors must be considered when selecting PPP partner. This agrees with Zhang (2005) who established that most vital criteria were financial, technical, managerial, safety and health. The study confirmed that the selection of private sector participants in PPP projects could be improved by using the ranked criteria. The strength of

the study was that the criteria could be used to evaluate the suitability of private partners by the public sector. Additionally, competency was important because an experienced private partner would create an effective decision-making environment; motivate personnel to implement performance management systems; align personnel to customer-oriented approaches; develop alternative service delivery strategies for low-income communities; and ensure that the PPP projects were implemented in a sustainable manner (Plummer, 2002).

Moreover, one of the interviewed PPP coordinator noted that;

> *PPPs creates many advantages for countries such as releasing financial burden of high cost infrastructure investments, bringing high quality public service and increasing efficiency of operations through transfer of private sector expertise*

Selection Criteria for Best Partnership

The fourth objective of the study was to determine the selection criteria for best partnership. A scale of 1-5 where 1= Not important, 2= Less important, 3= Neutral, 4 = Important and 5 = Very important was used. Table 4 summarizes the findings.

Table 4 Descriptive Statistics for Selection Criteria for Best Partnership

Statements	n	Min	Max	Mean	Std Dev	CoV
Previous PPP experience	15	1.00	5.00	3.97	0.59	0.16
The political environment	15	1.00	5.00	3.93	0.63	0.13
Technological structure for PPP participation	15	1.00	5.00	4.18	0.76	0.11
Strength of the private consortium	15	1.00	5.00	4.13	0.64	0.12
Allocation of responsibilities	15	1.00	5.00	4.26	0.57	0.14
Average scores				**3.89**	**0.67**	**0.13**

Source: Field Data (2020)

On the selection criteria for best partnership, the study revealed that previous PPP experience is important as indicated by a mean of 3.97 with standard deviation of 0.59, political environment was found to have a mean of 3.93 with standard deviation of 0.63, technological structure for PPP participation was found to have a mean of 4.18 with standard deviation of 0.76, strength of the private consortium was found to have a mean of 4.13 with standard deviation of 0.64 and allocation of responsibilities was found to have a mean of 4.26 with standard deviation of 0.57. The findings agreed with the findings of Hammami, Ruhashyankiko and Yehoue (2006) who established that the determinants for PPP partnerships were sources of revenue, the political environment, market conditions, macro-economic policies, strength of legal institutions, prior experience with PPP projects and the structure of technology to support PPP participation.

Inferential Statistics

The researcher conducted regression analysis to determine how critical success factors affect public private partnerships in the water sector in Kenya. The findings of Model Summary, ANOVA and Regression coefficients are as shown in subsequent sections.

Model Summary

The findings of coefficient of correlation R and coefficient of adjusted determination R2 is as shown in Table 5

Table 5 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.897	0.805	0.795	0.132

a. Predictors: (Constant), factors to consider when adopting PPP projects, success factors for PPP projects, factors for selection of PPP project and selection criteria for best partnership
b. Dependent Variable: Public Private Partnerships
Source: Field Data (2020)

The findings established that coefficient of correlation R was 0.897 an indication of strong correlation with the variables. The findings also established that coefficient of adjusted R2 was 0.795 which translates to 79.5%. This explains that 79.5% changes of public private partnerships can be explained the following variables; factors to consider when adopting PPP projects, success factors for PPP projects, factors for selection of PPP project and selection criteria for best partnership. The residual of 20.5% can be explained by other factors beyond the scope of the current study.

Regression Coefficients

In order to establish the individual influence of independent variables on dependent variables, the researcher conducted regression analysis. The findings are as shown in Table 6.

Table 6 Regression Coefficients

Variables	Unstandardized Coefficient*		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	5.623	0.233		2.445	.002
Adopting PPP projects	0.434	0.0141	1.273	2.543	.003
Success factors for PPP projects	0.486	0.0123	1.421	1.474	.001
Selection of PPP project	0.433	0.0133	1.103	2.607	.000
Selection criteria for best partnership	0.415	0.0257	1.231	1.234	.002

Source: Field Data (2020)

The Multiple Regression Model was as follows:
$\mathbf{Y= 5.623+0.434X_1 +0.486X_2 + 0.433X_3+0.415\ X_4}$
Where Y = Public Private Partnerships
X_1 = Adopting PPP projects

X_2 = Success factors for PPP projects
X_3 = Selection of PPP project
X_4 = Selection criteria for best partnership

The results in Table 6 shows that when holding all other variables constant, Public Private Partnerships would be at 5.623. A unit increase in adopting PPP projects while holding all other factors constant, Public Private Partnerships would be at 0.434. A unit increase in success factors for PPP projects when holding all the variables constant, Public Private Partnerships would be at 0.486. A unit increase in selection of PPP project while holding all the other variables constant, Public Private Partnerships would be at 0.433. A unit increase in selection criteria for best partnership while holding all the other variables constant, Public Private Partnerships would be at 0.415. Moreover, the study findings also revealed that the P-values of all indicators is less than 0.05 hence there exist a significant relationship between critical success factors and Public Private Partnerships.

CONCLUSIONS AND RECOMMENDATION

Conclusion

From the study findings, the following conclusions can be drawn; Public-Private Partnerships in water sector in Kenya is affected by various factors. These involve factors to consider when adopting PPP projects, success factors for PPP projects, factors to consider when selecting a PPP partner and selection criteria for best form of partnership. However, it can be concluded that governance structures, regulatory framework and political stability affect the adoption of PPP projects. Governance structures affect the success of PPPs as they create both political and technological goodwill for the survival of the Public-Private Partnerships. These structures provide the framework which helps in the composition of committees, provides the tools that are useful in monitoring and evaluation, institute the control measures and aid in constant reviews of the performance of the organizations under PPPs. Allocation of risks was a key factor influencing the choice of partner. These risks include operating, revenue, technical, construction, regulatory, project, force majeure and environmental risk. Additionally, the study concluded that competency was important because an experienced private partner would create an effective decision-making environment; motivate personnel to implement performance management systems. Also, public and private sector actors should share a common interest despite having different objectives or goals.

Recommendations

From the findings of the study, the study recommends that;

Public-Private Partnerships operate in a dynamic environment which determines the survival and general performance of its implementation projects. In this regard, the government needs to embrace this study to create a working relationship with public and private players in order to achieve water tight relationships that will protect the interests of partners in the PPPs. The policies created by the government in connection to the establishment, management and regulation of PPPs, are meant to help the private sector raise the revenue required while protecting the public from exploitation by the providers of the products and services.

The formation of governance structures of the partnerships must be done according to the framework provided with strict conformity with the rules and regulations as set out by the regulatory authority so that proper checks and balances can be instituted to take cognizance of the interests of the parties involved in the formation of PPPs.

The consideration of the socio-cultural standards and beliefs need to be considered so that the PPPs don't breach the codes of conduct in the environment which they are meant to operate in. These dynamics are necessary for the long term survival and reasonable performance of PPPs because research has shown that they greatly influence performance of these institutions.

Suggestions for Further Studies

First, this study only focused on the water sector which means that the influence of Public-Private Partnerships on other sectors is unknown. The study therefore recommends that further research to be conducted across the country in order to prove or disapprove the findings of this study.

BIBLIOGRAPHY

Abednego, M., & Ogunlana, S. (2006). Good project governance for proper risk allocation in public-private partnerships in Indonesia. *International Journal of Project Management, 24*(7), 622-634.

Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E., & Asenova, D. (2003). Achieving best value in private finance initiative project procurement. *Construction Management and Economics, 21*(5), 461-470.

Asian Development Bank. (2000) Developing best practices for promoting private sector investment in infrastructure (online) Available at http://www.adb.org/

Bäckstrand, K. (2006). Multi-stakeholder partnerships for sustainable development: Rethinking legitimacy, accountability and effectiveness. *Environmental Policy and Governance, 16*(5), 290-306.

BizClim. (2012). Reinforcing the capacities of East Africa to identify, develop and promote PPPs for infrastructure. *Regional Study Report, WP1.10.1-3.060,* 1-52.

Briggs, X. S (2003). Perfect Fit or Shotgun Marriage?: Understanding The Power and Pitfalls in Partnerships. *The Art and Science of Community Problem Solving project at Harvard University.*

Chan, A., Chan, D., Chiang, Y., Tang, B., Chan, E., & Ho, K. S. (2004). Exploring critical success factors for partnering in construction projects. *Journal of Construction Engineering and Management, 130*(2), 188-198.

Chan, A., Lam, P., Chan, D., Cheung, E., & Ke, Y. (2010). Critical success factors for PPPs in infrastructure developments: Chinese perspective. *Journal of Construction Engineering and Management, 136*(5), 484-494.

Cheung, E. (2009). Developing a best practice framework for implementing public private partnerships (PPP) in Hong Kong. PhD Diss., Queensland University of Technology.

Cheung, E., Chan, A., & Kajewski, S. (2012). Factors contributing to the successful public private partnership projects: Comparing Hong Kong with Australia and the United Kingdom. *Journal of Facilities Management, 10*(1), 45-58.

Clerck, D., & Demeulemeester, E. (2013). Experience pays heavily in a PPP environment, but government has the power to increase competition. *KU Leuven - Faculty of Economics and Business Working Paper, KBI 1308*. Retrieved from http://dx.doi.org/10.2139/ssrn.2273484

DeClerk, D., Demeulemeester, E., & Herroelen, W. (2012). Public private partnerships: Look before you leap into marriage. *Review of Business and Economic Literature, 57*(3), 246-258.

Delmon, V. R. (2014). *Creating sustainable services through domestic private sector participation: Structuring private-sector participation (PSP) contracts for small scale water projects*. Retrieved from Water and Sanitation Program website: http://www.wsp.org

Deloitte. (2014). *A clear view of the prospects: Connecting the dots*. Retrieved from http://www.deloitte.com

Friesecke, F. (2006). The increased significance of public private partnerships for urban development in Germany. Presentation at *The XXIII FIG Congress,* Munich, Germany.

Foddy, W. (2994). *Constructing questions for interviews and questionnaires: Theory and practice in social science*. Cambridge: Cambridge University Press.

Gawel, E. (2011). Political drivers of and barriers to public-private partnerships: The role of political involvement. *The Routledge Companion to Public-Private Partnership, 98,* 1-35.

Gubler, Z. J. (2013). Public choice theory and the private security market. *North Carolina Law Review, 91*, 745-808.

Hammami, M., Ruhashyankiko, J., & Yehoue, E. (2006). Determinants of public-private partnerships in infrastructure. *IMF Working Paper, WP/06/99*, 1-39.

Hands, W. (2009). The positive-normative dichotomy and economics. In D. Gabbay, P. Thagard and J Woods (eds.), *Handbook of the Philosophy of Science.* Amsterdam: Elsevier.

Hartwich, F., Tola, J., Engler, A., Gonzalez, C., Ghezan, G., Vazquez-Alvarado, J., Silva, J., Espinoza, J., & Gottret, M. V. (2008). *Building public-private partnerships for agricultural innovation*. Washington, DC: International Food Policy Research Institute.

Hodge, G., & Greve, C. (2011). Theorizing public-private partnership success: A market-base alternative to government. Paper presented to *The Public Management Research Conference*, Syracuse, NY.

International Bank for Reconstruction and Development (2009). *Attracting investors to African public-private partnerships: A project preparation guide.* Washington, DC: The World Bank.

Ismail, S. (2013). Factors attracting the use of public-private partnership in Malaysia. *Journal of Construction in Developing Countries, 18*(1), 95-108.

Ismail, S., & Ajija, S. R.K. (2013). Critical success factors of public private partnership (PPP) implementation in Malaysia. *Asia-Pacific Journal of Business Administration, 5*(1), 6-19.

Kamau, S.K. (2012). Kenya's PPP experience and pipeline projects. Presentation at the *African Conference on Public Private Partnership*, Kampala, Uganda.

Kamau, S. K. (2013). *Key issues in PPP program in Kenya*. Presentation at the PPP Seminar. Sankara, Nairobi (online) Available at http://www.africalegalnetwork.com/wp-content/uploads/2013/05/Key-issues-on-PPPs-in-Kenya-Stanley-K-kamau-.pdf

Kargol, A., & Sokol, E. (2008). Public private partnership and game theory. *Gazdálkodás Scientific Journal on Agricultural Economics*, *51*(19), 93-101.

King'oriah, G. (2004). *Fundamentals of applied statistics.* Nairobi: Kenya Institute of Education.

Kumaraswamy, M., & Anvuur, A. M. (2008). Selecting sustainable teams for PPP projects. *Building and Environment, 43*(6), 999-1009.

Li, B., Akintoye, A., & Edwards, P. (2007). Critical success factors for PPP/PFI projects in the UK construction industry. *Construction Management and Economics, 23*(5), 459-471.

Martimort, D., & Pouyet, J. (2006). "Build it or not": Normative and positive theories of public-private partnerships. *Journal of Economic Literature, 11,* 1-30.

McKee, M., Edwards, N., & Atun, R. (2006). Public-private partnerships for hospitals. *Bull World Health Organ, 84*(11).

Mihaela, C. (2013). Theoretical and practical aspects of the public-private partnership in the European Union. *Universitatea George Bacovia, 1*(11), 1-8.

Mugenda, O., & Mugenda A. (1999). *Research methods*. Nairobi: ACTS Press.

Plummer, J. (202). *Focusing partnerships: A sourcebook for municipal capacity building in public-private partnerships.* Sterling, VA: Earthscan Publications.

Pollock, A. (2007). Public-private partnerships and the public finance initiative. *Bulletin of the World Health Organization*, *85*(11), 821-900.

PPP Unit Kenya. (2013) About PPPU: Background (online) Available at http://www.pppunit.go.ke/

PricewaterhouseCoopers. (2012). *World overview of the PPP markets.* Retrieved from http://www.oecd.org/gov/budgeting/49945473.pdf

Qiao, L., Wang, S. Q., Tiong, R. L., & Chan, T. (2001). Framework for critical success factors of BOT projects in China. *The Journal of Project Finance*, 53-61.

Qizilbash, A. (2011). Public-private partnerships and the value of the process: The case of sub-saharan Africa. *International Public Management Review, 12*(2), 38-54.

Schepper, S., Dooms, M., & Haezendonck, E. (2014). Stakeholder dynamics and responsibilities in public-private partnerships: A mixed experience. *International Journal of Project Management, 32*(7), 1210-1222.

The World Bank. (2014). PPP overview: About public-private partnerships. PPP in Infrastructure Resource Centre (online) Available at http://ppp.worldbank.org/public-private-partnership/overview

Vining, A., & Boardman, A. (2006). Public-private partnerships in Canada: Theory and evidence. *UBC P3 Project, Working paper 2006-04* (online) Available at http://www.cupe.bc.ca/sites/default/files/2006_04_vining.boardman.pdf

World Economic Forum. (2008). World Economic Forum water initiative: Realizing the potential of public-private partnership projects in water.

Yuan, J., Zeng, A., Skibniewski, M., & Li, Q. (2009). Selection of performance objectives and key performance indicators in public-private partnership projects to achieve value for money. *Construction Management and Economics, 27*(3), 253-270.

Zhang, X. (2005). Criteria for selecting the private-sector partner in public-private partnerships. *Journal of Construction Engineering and Management, 131*(6), 631-644.

Zikmund, W. (2003). *Business research methods.* Southwestern College Publishers.

Zou, W., & Kumaraswamy, M. (2009). Game theory based understanding of dynamic relationships between public and private sectors in PPPs. In A. R. Dainty (Ed) *Proceedings of the 25th Annual ARCOM Conference* (pp.197-205), Nottingham, UK.