Public Private Partnership (PPP) Projects in Uganda: Potential models of PPP projects for Uganda National Roads Authority (UNRA)

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Abstract

Since 2008, UNRA has severally lost funds due to poor management of PPP projects. This phenomenon is partly attributed to limited capacity in the roads sector, to analyze and determine appropriate PPP models. This study entailed analysis of PPP models, qualifying some for uptake by UNRA. The study was guided by the principal-agent theory. The objectives of the study were; to examine the different PPP models used in the roads sector in Uganda and to identify those usable by UNRA. The sample size comprised of 127 key internal stakeholders of UNRA. Respondents were selected using simple random sampling. Data was collected using self-administered questionnaires and documents review check list. Data was analysed using descriptive statistics and inferential statistics. The study found that UNRA uses the PPP models of Design, Build, Operate (DBO), Build, Own and Operate (BOO), Build, Operate and Transfer (BOT) and Build, Own, Operate and Transfer (BOOT). The findings indicate that UNRA needs to select the most efficient PPP model and recommend other models for private road contractors in Uganda. The study recommends that UNRA considers introducing other models such as Design Build Finance (DBF), Design Build Finance Maintain (DBFM), Design Build Finance Operate (DBFO) and Design Build Finance Operate Maintain (DBFOM) to improve efficiency when working with its partners to implement PPP projects in the roads sector.

Key words: Diagnosis, Public Private Partnerships, Models, Roads, Authority

Introduction

Public Private Partnership projects have become popular in developing counties as a way of involving the private sector in the development of public infrastructure (Sarvari, Valipour, Yahya, Noor, Beer & Banaitiene, 2019). Governments are increasingly embracing partnership with private firms to provide public services through PPP projects which are also known to mitigate budget constraints (Jinbo, Yunpeng, Lulu &Yan, 2018). PPP is a globally accepted public sector procurement mechanism by which the government gets commitment from the private sector and transfers some of the responsibilities of providing public facilities and services to the private sector (Qistina et al. 2018). Farquharson and Yescombe (2011) and Bouman et al. (2013) highlight that PPP models are contractual arrangements of varied nature where the public and private sector share rights and responsibilities during the duration of the contract. For effective use of such PPPs in the roads sector in Uganda, there is need to understand the nature of the relationship between government and private organizations and to establish their capacity to jointly deliver services to citizens as laid out in the principal agent theory (Parker, Dressel, Chevers & Zeppetella, 2018).

The principal agent theory states that an organization is made up of a nexus of contracts between the owners of economic resources (the principals) and managers (the agents) who are

given the responsibility of using such resources to execute certain tasks in order to achieve the intended objectives (Jensen & Meckling, 1976). PPP projects contractual arrangements are differentiated among others by the extent of private sector risk, the role of the private actors, how the private party is paid, age of asset (new or old) and the types of PPP projects being proposed in the roads sector (Farquharson and Yescombe, 2011).

Some PPP involve financing, building and managing new projects in the roads sector and public assets while others transfer responsibility for upgrading and managing existing projects and assets to the private sector (Farquharson & Yescombe, 2011; Gibson et al., 2015; World Bank, 2017a; African Development Bank (ADB) et al 2014).

According to Solomon et al (2014), there are various models of PPP projects used in the road sector projects such as Private Finance Initiative (PFI), Concessions, Joint Ventures, Design and Build (DB), Build, Own and Operate (BOO), Leasing, affermage, Build Operate Transfer (BOT), Build Own Operate Transfer (BOOT), Contracting out (CO), Management contract (MC), Service contract (SC), Design Build Finance (DBF), Design Build Finance Maintain (DBFM), Design Build Finance Operate (DBFO) and Design Build Finance Operate Maintain (DBFOM) PPP Models. Delmon (2010) points out that while several of the PPP projects have registered success in the roads sector, practitioners face a predicament of identifying the appropriate model for PPP projects to adopt in the roads sector (Bouman et al., 2013). In a PPP project arrangement, a concession is entered where a public entity gives the private entity the right to construct for an agreed period of time ranging from 20 to 30 years (Mouraviev et al., 2016). PPP projects feature in different forms. According to Hall (2008), joint ventures are Institutional Public Private Partnerships (IPPP). Kamau (2018) indicates that in PFI, the public entity enters into a contractual arrangement with the private sector entity so that the private entity finances the project (Khadka, 2018).

In the Design Build Operate (DBO) model, the private entity designs, constructs and maintains the road project facility to the extent of meeting a specific amount of deliverables agreed upon with the public entity (Khadka, 2018). Gwary et al. (2016) observe that BOO is where the public entity enters into a contract with a private entity so that the latter can finance, build, own and operate a project facility for a certain period of time.

Lease is where the private sector is responsible for the service in its entirety and undertakes obligations relating to quality and service standards for a project facility (Obayelu, 2018). According to African Development Bank (ADB) (2008), the affermage is where partners agree on a fee based on the rate of payment per unit to be sold by the private entity. The private operator is responsible for operating and maintaining the utility but not for financing the investment. BOT and BOOT are specifically designed for new projects that require extensive rehabilitation (Obayelu, 2018).

A management contract is where a private agency carries out maintenance of a facility on behalf of the public entity for a fee (Kwak et al., 2009). Service contract (SC) is where the public sector hires a private company or entity to carry out one or more specified project tasks or services for a specific period, typically 1 to 3 years (Obayelu, 2018). Contracting out (CO) refers to a situation where private entities receive a budget to provide certain services and

manage a government project facility. Contracting out can be viewed as a form of PPP, where the public sector mandates a private company to design feasible projects for the delivery of specific services based on a contract stipulated between the parties.

Design Build Finance (DBF) is where the public entity enters into a contractual arrangement with the private sector entity authorizing the latter to come up with feasible projects aimed at providing certain services to the public (Ramsey & Asmar, 2016). Design Build Finance and Operate (DBFO) is where the private sector is in charge of the design, construction, financing and operation of the projects' assets for the duration of the contract (Berrone et al 2018). Design, build, finance and maintain (DBFM) is where the private sector is in charge of the design, construction, financing and maintenance of the projects' assets for the duration of the contract (Berrone et al., 2018). The design, build, finance, operate and maintain (DBFOM) is where the public entity enters into a contractual arrangement with the private sector entity so that the latter comes up with feasible projects aimed at provision of certain services to the public under an arrangement similar to that of BOOT (USDOT 2014).

Most scholars consider a qualitative analysis by trying to ascertain whether there is a more suitable model for PPP projects from among the many alternatives already presented (ADB et al., 2014). PPP projects experts argue that one significant factor affecting the choice of an appropriate PPP model is the ability to delegate the choice of the precise technical solution to public sector requirements to the private sector which allows introduction of innovation and stimulates the exhibition of private sector competence and potentially superior effectiveness (Bouman et al., 2013). Delmon (2010) and Farquharson & Yescombe (2011) agree that the choice of an appropriate model for PPP projects may be dependent on firm policy foundations, a long-term political commitment, and a sound and predictable institutional legal and regulatory framework (Delmon 2010; Farquharson & Yescombe 2011). Several scholars argue that there are a number of aspects to consider when choosing the appropriate model for PPP projects such as potential to improve quality and efficiency of services, substantial savings due to reduced costs, adequate experience in the private sector, opportunities to generate new ideas and value for money. These attributes can be achieved through frugal use of resources including reduction in PPP project construction time, closer monitoring, evaluation and control by public sector agencies in the roads sector (Roehrich et al., 2014).

Problem statement

Uganda has adopted the use of PPP models to implement a number of proposed road sector projects (Kavuma, 2013). Although Uganda has been using contracting out (CO) model to manage road construction and maintenance projects, it is planning to use other PPP models such as management contract (MC) for Kampala-Entebbe express high way project and build, operate and transfer (BOT) to construct the Kampala-Jinja highway project (Dentons, 2014). However, UNRA has lost money in roads sector construction and maintenance projects (Inspectorate of Government, 2016). The citizens' concerns on mismanagement of tax payers' money due to UNRA's failure to adopt the appropriate PPP model in the road sector construction and maintenance projects calls for an in depth investigation (Cheung, Chan & Kajewski, 2012).

Study objectives

This study was conducted to analyze the existing models for PPP projects and identify those applicable to Uganda National Roads Authority.

Specifically, the study aimed at examining the different models for PPP projects being used in the roads sector in Uganda and analyzing the appropriate model for PPP projects that can potentially be applied by UNRA.

The Principal-Agent Theory

The principal-agent theory was initiated in the early 1970s by experts such as Barry Mitnick and Stephen Ross (Barry, 2006). Agency theory contends that an organization is made up of a nexus of contracts between the owners of economic resources (the principals) and managers (the agents) who are given the responsibility of using such resources to execute certain tasks in order to achieve the intended objectives (Jensen & Meckling, 1976).

The theory is based on the premise that agents are more informed than principals and that such information disequilibrium results in certain unethical practices which negatively impacts the principals' capacity to effectively monitor and evaluate whether their interests are being well catered for by agents (Adams 1994). The agency theory provided realities that were relevant to this study and aroused the review of the kind of PPP project contracts, and the management structures that are essential for influencing agents to do certain things that are in line with the expectation and specifications of the principal (Rendon, 2009). In such a case, the principals are both the citizens and government officials like executives of UNRA. The agency theory also encourages coming up with certain regulations and guidelines to ensure that business managers should behave in line with what business owners expect (Hawley & Williams, 1996). Watts (1988) suggests that implementation of PPP projects in the roads sector is a bonding cost borne by agents to satisfy the principals' demands for accountability.

Therefore PPP project adoption and implementation in the roads sector requires the principals to always monitor the management of such PPP projects by the private sector agencies (Iossa & Martimort, 2015). The response could be either ensuring effective implementation of PPPs in the roads sector or private sector not accepting responsibility for not adhering to the advice of the public sector principal (Javed et al., 2013). Agency theory guides the principal to check whether the agent is effectively implementing the road sector PPP projects in line with agreed terms, conditions, parameters, specifications and standards (Van Den Hurk & Verhoest, 2016). Also the principal agency theory suggests a variety of reasons why traditionally procured public infrastructure projects exhibit higher costs of construction in the roads sector compared to PPP projects. In addition, the transfer of the construction risk to the private partner should be explicitly priced in a PPP project (Blanc, Hugh & Timo, 2006). Scholars like Shankman (1999) suggests inclusion of other key stakeholders in a principal-agent relationship since they also play an important role in shaping the work of the agent to ensure that the principal's objectives are achieved in an effective and efficient manner. Principally, Innovative PPPs are coming up in most developing countries like Uganda as a result of limited investment, expertise and other resources in public sectorals (Iossa &

Martimort, 2015). Such engagement of the agents in PPP projects is part of a mechanism for improving productivity and driving effectiveness, efficiency and economy in the roads sectors by the principals worldwide (Farquharson & Yescombe, 2011).

Methodology

A quantitative approach was used under a cross-sectional survey design (Creswell, 2013). The study population consisted of 190 key stakeholders of UNRA (Shari, 2012). The target population was 190 key stakeholders of UNRA comprising 10 senior managers, 10 contracts committee members, 10 staff of the procurement and disposal unit, 130 staff from the user departments and 30 officers from UNRA regional offices. The respondents were selected because of their direct and indirect involvement in the implementation of the different models for PPP projects to ensure value for money in the roads sector in Uganda. They had the right knowledge and skills pertaining to the use of different models for PPP projects to ensure VFM in the roads sector. Indeed, they were the most suitable respondents that could provide the necessary information required by the researcher. A sample size of 127 respondents was used based on Krejcie and Morgan table (1970). Respondents were selected using simple random sampling. Data was collected using self-administered questionnaires and documents review check list (Joubish et al. 2011). Data was analysed using descriptive statistics and inferential statistics (Sekaran, 2007). Ethical clearance was obtained from North West University (NWU), Gulu University Research Ethics Committee and the Uganda National Council for Science and Technology (De Vos, 2005).

Study findings

Demographic characteristics

Table 1. Respondents' Background Characteristics.

Characteristic	Category	Frequency	Percentage
Gender	Male	89	70.1
	Female	38	29.9
Age	20-29 years	48	37.8
	30 - 29 years	55	43.3
	40 - 49 years	24	18.9
Education Level	Bachelor's Degree	69	54.3
	Postgraduate Diploma	19	15.0
	Master's Degree	35	27.6
	PhD	4	3.1
Terms of employment	Temporary staff	13	10.2
	Contract staff	28	22.0
	Permanent staff	85	67
	Others specify	1	0.8

Characteristic	Category	Frequency	Percentage
Tenure with UNRA	Less than a year	30	23.6
	1 - 5 years	85	66.9
	6 - 10 years	12	9.4
	Support staff	62	26.1

Source: Primary data *n=127*

Majority of the respondents were male with 70.1% and the rest were female with 29.9%. The most predominant age group that responded was 30-39 with 43.3%, followed by 20-29 with 37.8%) and 40-49 with 18.9%. The majority of the respondents were bachelor's degree holders with 54.3%, followed by master's degree holders with 27.6%, postgraduate diploma with 15% and Doctorate with 3.1%. 66.9% of respondents had worked with UNRA for 1-5 years, 23.6% had served UNRA for less than one year and 9.4% had spent 6-10 years with UNRA. Majority of the respondents were permanent staff with 67%, followed by contract staff with 22%, temporary staff with 10.2% and other terms with 0.8%.

Empirical findings for different models of PPP projects and appropriate model for PPP projects to be used in the roads sector

The findings using factor analysis and descriptive statistics for models of PPP projects and applicable models to UNRA were extracted as shown in tables 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.

Table 2: Descriptive Statistics for Different PPP models being used by UNRA

	Mean	Std. Deviation	Analysis N
UNRA uses Concession, Contracting out, Management contract and Service contract when working with its partners	2.8346	.76391	127
Uganda National Roads Authority (UNRA) uses DBO, BOO, BOT and BOOT, when working with its private sector partners	2.9213	.73037	127
UNRA uses PFI, Joint Venture, Leasing and affermage PPP Models when working with its private sector partners	2.7874	.69727	127
UNRA uses DBF, DBFM, DBFO and DBFOM PPP Models when working with its private sector partners	2.7717	.75791	127
Average	2.8288	0.73737	127

Table 2 above indicates that different models for PPP projects were examined based on the means and standard deviation where the mean=2.8288 and standard deviation=0.73737 and so there was no much variation in the responses on the different models for PPP projects. More specifically in regard to different models for PPP projects used by UNRA, Concession, Contracting out, Management contract and Service contract when working with its partners had the mean of 2.8346 and standard deviation of 0.76391, UNRA uses DBO, BOO, BOT and BOOT, when working with its private sector partners had the mean of 2.9213 and standard deviation of 0.73037, UNRA uses PFI, Joint Venture, Leasing and affermage PPP Models when working with its private sector partners had the mean of 2.7874 and standard deviation

of 0.69727 and UNRA uses DBF, DBFM, DBFO and DBFOM models for PPP projects when working with its private sector partners had the mean of 2.7717 and standard deviation of 0.75791. Therefore, UNRA mainly uses the models for PPP projects of DBO, BOO, BOT and BOOT when working with its partners to implement PPP projects in the roads sector in Uganda since the descriptive table above clearly indicates that these are the PPP models that had the highest mean of 2.9213 and standard deviation of .73037.

Table 3: Inter correlations matrix for models of PPP projects being used by UNRA in the roads sector

		1	2	3	4
Correlation	UNRA uses Concession, Contracting out, Management contract and Service contract when working with its partners.	1.000			
	Uganda National Roads Authority (UNRA) uses DBO and BOO, BOT and BOOT, when working with its private sector partners.	.446**	1.000		
	UNRA uses PFI, Joint Venture, Leasing and affermage PPP Models when working with its private sector partners.	.753**	.684**	1.000	
	UNRA Uses Design Build Finance (DBF), Design Build Finance Maintain (DBFM), Design Build Finance Operate (DBFO) and Design Build Finance Operate Maintain (DBFOM) PPP Models when working with its private sector partners to implement PPPs in the roads sector in Uganda.	.647**	.455**	.688**	1.000

a. Determinant = .110

Table 3 shows moderate to high inter correlations and determinant =.110> 0.000 which means the PPP models items used in the roads sector in Uganda are convergent. Based on the above inter-correlations matrix table**,** the categories of models for PPP projects used by UNRA with the highest inter correlation were UNRA uses Concession, Contracting out, Management contract and Service contract PPP models when working with its partners to implement PPPs in the roads sector in Uganda because it had the highest initial inter correlation measure of 1.000 among all other categories of PPP models.

Table 4: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.746
Bartlett's Test of Sphericity	Approx. Chi-Square	273.142
	Df	.6
	Sig.	.000

The communalities in table 5 indicate a range of 0.5 to 0.8 which means that different PPP models being used by UNRA in the roads sector in Uganda are convergent. From the table 4 above**,** the KMO of 0.746 and Bartlet's measure of sphericity indicates that the sample of the models for PPP projects of Concession, Contracting out, Management contract, Service

contract, DBO, BOO, BOT, BOOT, PFI, Joint Venture, Leasing, DBF, DBFM, DBFO and DBFOM models for PPP projects used by UNRA when working with its private sector partners was significant (sig=.000) and adequate

Table 5: Communalities of different models of PPP projects being used by UNRA

Communalities

	Initial	Extraction
UNRA uses Concession, Contracting out, Management contract and Service contract when working with its partners.	1.000	.724
Uganda National Roads Authority (UNRA) uses DBO, BOO, BOT and BOOT, when working with its private sector partners.	1.000	.568
UNRA uses PFI, Joint Venture, Leasing and affermage PPP Models when working with its private sector partners.	1.000	.871
UNRA uses DBF, DBFM, DBFO and DBFOM PPP Models when working with its private sector partners.	1.000	.688

Extraction Method: Principal Component Analysis.

The component matrix table 5 above has four categories of PPP models extracted and explaining 72.3% of total variance of PPP models used by UNRA when working with its partners to implement different PPP projects in the roads sector in Uganda being; Concession, Contracting out, Management contract and Service contract extracted at 0.724, DBO, BOO, BOT and BOOT extracted at 0.568, PFI, Joint Venture, Leasing and affermage PPP Models extracted at 0.871 and DBF, DBFM, DBFO and DBFOM PPP Models extracted at 0.688. Therefore based on the table 4 above the models for PPP projects used by UNRA when working with its private sector partners that had the highest communalities were PFI, Joint Venture, Leasing and affermage models for PPP projects because they were extracted at the highest point of 0.871.

Table 6: Component Matrix of Different PPP models being used by UNRA

Different PPP models being used by UNRA in the roads sector in Uganda	Factor loadings
UNRA uses Concession, Contracting out, Management contract and Service contract when working with its partners.	.933
Uganda National Roads Authority (UNRA) uses DBO, BOO, BOT and BOOT, when working with its private sector partners	.851
UNRA uses PFI, Joint Venture, Leasing and affermage PPP Models when working with its private sector partners.	.830
Uganda National Roads Authority (UNRA) uses DBF, DBFM, DBFO and DBFOM PPP Models when working with its private sector partners.	.754

Extraction Method: Principal Component Analysis.

Table 6 above indicates that UNRA uses Concession, Contracting out, Management contract and Service contract with factor loading of .933, DBO, BOO, BOT and BOOT with factor loading of .851, PFI, Joint Venture, Leasing and affermage PPP Models with factor loading of

.830 and then DBF, DBFM, DBFO and DBFOM models for PPP projects with factor loading of .754 when working with its private sector partners. Therefore based on the table 5 above, the PPP models used by UNRA with highest Factor loading when working with its private sector partners were Concession, Contracting out, Management contract and Service contract because they had the highest Factor loading of .871.

Table 7: Descriptive statistics for appropriate PPP model to be used by UNRA

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
One that leads to improvements in the quality of service and efficiency of UNRA when working with its partners	4.1102	.80896	127
One that leads to substantial savings because of reduced costs by UNRA when working with its private sector partners	3.7953	.91147	127
One that leads to access of enough experience from the private sector by UNRA when working with its private sector partners	3.8425	.83974	127
One that presents enough opportunities for generation of new ideas by UNRA) when working with its private sector partners	3.9764	.84951	127
One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners	4.0000	.84515	127
One that makes sure that VFM can be reaped from use of resources provided to UNRA when working and its partners	4.1024	.90707	127
One that leads to substantial reduction in construction time for national roads by UNRA when working with its partners	4.0000	.88192	127
One that leads to substantial higher degree of monitoring, evaluation and control by UNRA when working with its partners	4.0000	.97590	127
Average	3.9784	0.87747	127

In table 7, on average (mean=3.9784, standard deviation=0.87747), the applicable PPP models to be used were; One that leads: to improvements in the quality of service as well as better efficiency by UNRA when working with its partners (mean=4.1102,standard deviation=.80896), substantial savings because of reduced costs by UNRA when working with its partners (mean=3.7953, standard deviation=.91147), access of enough experience from the private sector by UNRA when working with its partners (mean=3.8425, standard deviation=.83974), enough opportunities for generation of new ideas by UNRA when working with partners (mean=3.9764, standard deviation=.84951), substantial improved efficiency in construction by UNRA when working with its partners (mean=4.0000, standard deviation=.84515), VFM can be reaped from use of resources provided to UNRA when working and its partners (mean=4.1024, standard deviation=.90707), substantial reduction in construction time by UNRA when working with its partners (mean=4.0000, standard deviation=.88192) and substantial higher degree of monitoring, by UNRA when working with its partners (mean=4.0000, standard deviation=.97590). Based on the results from descriptive statistics table above, the appropriate model for PPP projects to be used by UNRA in the roads sector in Uganda should be any one of the models of PPP projects used in the roads sector

as longer as it leads to improvements in the quality of service as well as better efficiency by UNRA when working with her private sector partners to implement PPP projects in the roads sector in Uganda since this aspect had the highest mean of 4.1102 and standard deviation of .80896, compared to the rest of the aspects.

Table 8: Inter Correlation matrix for appropriate model of PPP projects used by UNRA

		1	2	3	4	5	6	7	8
Correlation	One that leads to improvements in the quality of service as well as better efficiency UNRA when working with its partners	1.000							
	One that leads to substantial savings because of reduced costs by UNRA when working with its private sector partners.	.472**	1.000						
	One that leads to access of enough experience from the private sector by UNRA when working with its private sector partners	.563**	.621**	1.000					
	One that presents enough opportunities for generation of new ideas by UNRA) when working with its private sector partners.	.581**	.619**	.685**	1.000				
	One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners	.615**	.587**	.637**	.663**	1.000			
	One that makes sure that VFM can be reaped from use of resources provided to UNRA when working and its partners	.698**	.544**	.521**	.714**	.673**	1.000		
	One that leads to substantial reduction in construction time for national roads by UNRA when working with its partners	.567**	.583**	.622**	.731**	.713**	.665**	1.000	
	One that leads to substantial higher degree of monitoring, evaluation and control by UNRA when working with its partners	.563**	.446**	.562**	.613**	.539**	.681**	.581**	1.000

a. Determinant = .004

Table 8 above shows that there is also moderate to high inter correlations and determinant =.004> 0.000 which means that the all the items for measuring the appropriate PPP model used by UNRA are also convergent. Based on the above inter-correlations matrix table, the item that

can be used to measure the appropriate model for PPP projects to be used by UNRA was one that leads to improvements in the quality of service as well as better efficiency because it had the highest initial inter correlation measure of 1.000 among all other items.

Table 9: KMO and Bartlett's Test for appropriate model of PPP projects

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.911
Bartlett's Test of Sphericity	Approx. Chi-Square	671.053
	Df	.28
	Sig.	.000

The communalities in table 9 indicates a range of 0.1 to 0.10 which means that the different items used to measure the appropriate PPP model to be used by UNRA in the roads sector are convergent. From the table 9 above, the KMO of 0.911 and Bartlett's measure of sphericity indicates the sample of the items used to measure the appropriate model for PPP projects to be used by UNRA in the roads sector as one that leads to a number of improvements. These include improvements in the quality of service as well as efficiency, substantial savings because of reduced costs, access of enough experience from the private sector, enough opportunities for generation of new ideas, substantial improved efficiency in construction obtaining value for money to be reaped from use of resources provided, substantial reduction in construction time and substantial higher degree of monitoring by UNRA106.

Table 10: Communalities for appropriate model of PPP projects to be used by UNRA in the roads sector

Communalities

	Initial	Extraction
One that leads to improvements in the quality of service as well as better efficiency UNRA when working with its partners	1.000	.605
One that leads to substantial savings because of reduced costs by UNRA when working with its private sector partners.	1.000	.556
One that leads to access of enough experience from the private sector by UNRA when working with its private sector partners.	1.000	.642
One that presents enough opportunities for generation of new ideas by UNRA) when working with its private sector partners.	1.000	.752
One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners	1.000	.704
One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners	1.000	.721
One that makes sure that VFM can be reaped from use of resources provided to UNRA when working and its partners	1.000	.714
One that leads to substantial reduction in construction time for national roads by UNRA when working with its partners	1.000	.585

Extraction Method: Principal Component Analysis.

Table 10 shows communalities ranging from 0.5 to 0.752, an indication of convergence. The eight items used in measuring the appropriate PPP models to be used by UNRA in the roads

sector were extracted, registering 65.98% of total variance with the first item being one that leads: to improvements in the quality of service as well as better efficiency extracted at 0.605, substantial savings because of reduced costs extracted at 0.556, access of enough experience from the private sector extracted at 0.642, enough opportunities for generation of new ideas extracted at 0.752, substantial improved efficiency in construction extracted at 0.704, value for money to be reaped from use of resources provided extracted at 0.721, substantial reduction in construction time extracted at 0.714 and substantial higher degree of monitoring by UNRA when working with its partners extracted at 0.585. Therefore based on the Table 10 above, the items used in measuring the appropriate model for PPP projects used by UNRA in the roads sector is one that presents enough opportunities for generation of new ideas by UNRA when working with its private sector partners because it was extracted at the highest point of 0.871.

Table 11: Component matrix for appropriate model of PPP projects used by UNRA

Appropriate model of PPP projects to be used by UNRA in roads sector	Factor loadings
One that leads to improvements in the quality of service as well as better efficiency UNRA when working with its partners.	.867
One that leads to substantial savings because of reduced costs by UNRA when working with its private sector partners	.849
One that leads to access of enough experience from the private sector by UNRA when working with its private sector partners.	.845
One that presents enough opportunities for generation of new ideas by UNRA) when working with its private sector partners	.839
One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners.	.801
One that leads to substantial improved efficiency in construction of national roads by UNRA when working with its partners	.778
One that makes sure that VFM can be reaped from use of resources provided to UNRA when working and its partners	.765
One that leads to substantial reduction in construction time for national roads by UNRA when working with its partners.	.746

Extraction Method: Principal Component Analysis.

Table 11 above indicates that the eight items for measuring the appropriate model of PPP projects to be used by UNRA in the roads sector in Uganda were in consideration of one that: presents enough opportunities for generation of new ideas to UNRA when working with its partners (factor loading=.867), makes sure that VFM can be reaped from use of resources provided to UNRA when working with its partners (factor loading=.849), leads to substantial reduction in construction time by UNRA when working with its partners (factor loading=.845), one that leads to substantial improved efficiency in construction by UNRA when working with its partners (factor loading=.839), leads to access of enough experience from the private sector by UNRA when working with its partners (factor loading=.801), leads to improvements in the quality of service as well as better efficiency by UNRA when working with its partners (factor loading=.778), leads to substantial higher degree of monitoring, evaluation and control by

UNRA when working with its partners (factor loading=.765) and leads to substantial savings because of reduced costs by UNRA when working with its partners to implement different PPP projects in the roads sector in Uganda (factor loading=.746). Therefore based on the table 11 above, the item for measuring the appropriate PPP models to be used by UNRA in the roads sector in Uganda with highest Factor loading was one that leads to improvements in the quality of service as well as better efficiency by UNRA when working with its partners because it had the highest Factor loading of .871.

Discussion of the study findings

PPP models used by UNRA

The first objective of the study was to examine the models for PPP projects used by UNRA in the roads sector in Uganda. In line with this objective, the findings revealed that UNRA uses Concession, Contracting out, Management contract and Service contract models for PPP projects when working with its partners with a mean of 2.8346 and standard deviation of 76391 which is in line with what scholars such as Kwak et al. (2009), Obayelu (2018), Mouraviev et al. (2016) and Nepal Department of Health Services, 2014say.

Secondly, the findings revealed that UNRA uses BOO, BOT and BOOT models for PPP projects, when working with its partners with a mean of 2.9213 and standard deviation of .73037 which is in line with what scholars such as Gwary et al. (2016:52) and Obayelu (2018) contend.

In addition, UNRA uses PFI, Joint Venture, Leasing and affermage models for PPP projects when working with its partners with a mean of 2.7874 and standard deviation of .69727 which is in line with what scholars such as Obayelu (2018) and Hall (2008), assert.

Lastly, the findings revealed that UNRA uses DBF, DBFM, DBFO and DBFOM models for PPP projects when working with its private sector partners.

Applicable models for PPP projects

The second objective of the study was to analyze the attributes of applicable model for PPP projects that can be used by UNRA in the roads sector in Uganda. In line with this objective, findings indicate that applicable model for PPP projects should have capacity to result in: improvements in the quality of service and efficiency of UNRA with a mean of 4.1102 and standard deviation of .80896; substantial savings because of reduced costs with a mean of 3.7953 and standard deviation of .91147; One that leads to access of enough experience from the private sector with a mean of 3.8425 and standard deviation of .83974; enough opportunities for generation of new ideas with a mean of 3.9764 and standard deviation of .84951; substantial improved efficiency in construction with a mean of 4.0000 8425 and standard deviation of .84515; VFM can be reaped from use of resources with a mean of 4.1024 and standard deviation of .90707; substantial reduction in construction time with a mean of 4.0000 and standard deviation of .88192; and substantial higher degree of monitoring, with a mean of 4.0000 and standard deviation of .97590. These parameters are in line with what researchers, scholars, practitioners and development partners such as Roehrich et al.(2014), Aleksandrs

and Peteris (2015), Bouman et al.(2013), Delmon (2010), Farquharson and Yescombe (2011), concur.

Conclusion

UNRA mainly uses the PPP project models of DBO, BOO, BOT and BOOT when working with its partners to implement PPP projects in the roads sector in Uganda. These models for PPP projects had the highest mean of 2.9213 and standard deviation of .73037. The appropriate PPP model that can be used by UNRA in the roads sector in Uganda may be any one of the above PPP models as long as it leads to improvement in the quality of service as well as efficiency by UNRA when working with private sector partners to implement PPP projects in the roads sector.

Recommendations

UNRA should not only use the models for PPP projects of DBO, BOO, BOT and BOOT but also embrace models such as Design Build Finance (DBF), Design Build Finance Maintain (DBFM), Design Build Finance Operate (DBFO) and Design Build Finance Operate Maintain (DBFOM) when working with its partners to implement PPP projects in the roads sector. Over all, any model for PPP projects to be used by UNRA in implementing construction and maintenance projects should always reflect: improvements in the quality of service and efficiency, substantial savings, opportunities for generation of new ideas, improved efficiency in construction, value for money, substantial reduction in construction time and high degree of monitoring, evaluation and control.

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