

Critical success factors (CSFs) for motivating end-user stakeholder's support for ensuring sustainability of PPP projects in Nigerian host communities

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Abstract

Purpose – This study aims to investigate two public private partnership (PPP) road projects in Nigeria for exploring factors that can motivate end-user stakeholders for contributing towards sustaining a PPP project in the long-term.

Design/methodology/approach – Using a case study methodology approach, this study adopts two-way data collection strategies via in-depth interviews with PPP experts and end-user stakeholders in Nigeria host communities and a questionnaire survey to relevant stakeholders.

Findings – The study identifies an eight-factor structure indicating critical success factors for ensuring end-user stakeholders support PPP projects on a long-term basis in their host communities.

Originality/value – Results of the study have huge implications for policymakers and project companies by encouraging the early integration of far-sighted measures that will promote long-term support and sustainability for PPP projects amongst the end-user stakeholders.

Keywords: Nigeria, Sustainability, Road projects, Public private partnership, End-user stakeholders

1. Introduction

The procurement of public infrastructures such as prisons, roads, schools, rail tracks and train systems, electricity amongst others, through public private partnership (PPP) arrangements has been a major challenge for Nigeria, despite been used successfully in other parts of the globe in the past two decades (Toriola-Coker *et al.*, 2020). According to Delmon (2017), many countries have sustainably developed guidelines, policies and frameworks to successfully realise the implementation of infrastructure projects using the PPP model. However, despite early positive strides, Nigeria remains beset by several infrastructure procurement problems, a key aspect of which is “how to sustain the executed PPP projects”– despite the extensive human and material resource investment (Babatunde *et al.*, 2016). Evidence from earlier studies like Sanni (2016), Babatunde *et al.* (2016) and Owolabi *et al.* (2019) have shown that many PPP projects in Nigeria face difficult challenges recouping their investments, especially where the user-pay approach has been used.

Apart from the politicisation of contracts, less transparent and pseudo competitive bidding process, including land ownership problems; stakeholder opposition to PPPs in Nigeria remain considerably high (Owolabi *et al.*, 2019). According to [Toriola-Coker \(2018\)](#), sustaining the smooth running of many critical PPP projects in the country has been a major challenge due to the neglect of project end-users and the need for their participation in the project delivery process ([Toriola-Coker, 2018](#)). As suggested by Owolabi *et al.* (2019), the social acceptability of PPP projects appears considerably low as most PPP policy decisions and implementation programmes have adopted a top-down approach. Many PPP projects such as the Lekki-toll gate in Lagos amongst others, face threats to their long-term profitability and sustainability due to the mismanagement of end-users (i.e. commuters, drivers, local residents, etc.) by the government, thus resulting in several protests and vandalism.

As corroborated by Sathyasheel and Deepak (2017), a critical factor contributing to the failure of many Nigerian PPP initiatives and their inability to sustain the benefits of PPP projects is the divergence between end-user expectations and public sector interests on PPP projects. Previous researchers have documented how end-user stakeholders have been sidelined and their opinions relegated, which consequently affects the long-term operational sustainability of many of Nigeria's early PPP projects (Amadi *et al.*, 2014; Owolabi *et al.*, 2019; [Toriola-Coker *et al.*, 2020](#)). In the context of this study, we describe sustainability as the long-term maintainability of the operational and physical aspects of PPP projects in a way that helps deliver long-term anticipated benefits and goals (Owolabi *et al.*, 2020). Evidence from prior literature such as Owolabi *et al.* (2019); [Toriola-Coker *et al.* \(2020\)](#) have highlighted how a number of Nigeria's PPP projects have encountered end-user opposition, not only from environmental and social pressure groups and the media but also from community stakeholders', due to issues such as unwillingness to pay for toll roads, protest over community lands; environmental damage during project construction ([Toriola-Coker, 2018](#)). According to [Toriola-Coker \(2018\)](#), this limited involvement and engagement of project end-users have led to general apathy and lack of sense of ownership for projects at community levels; thereby negatively impacting on the long-term maintainability of these flagship PPP projects.

Arguing on the need for better end-user engagement for Nigeria's PPP delivery, Amadi *et al.* (2014), highlighted the growing concern over the sustainability practices of end-user stakeholders on Nigeria's first PPP road project. Similarly, Toriola-Coker further highlighted pressing challenges such as environmental impact, benefit realisation and low community-level participation amongst other impediments that are militating against the smooth operations of the PPP project in Nigeria ([Toriola-Coker, 2018](#)). This argument has been further buttressed by [Oyedele \(2012a, 2012b\)](#), who argued that Nigeria still lacks the operational capability to push many PPP projects through to success. However, these shortcomings are in contrast to PPP delivery in other countries (i.e. UK, Germany, The Netherlands, Spain, Italy and France) where robust mechanisms are in place for bringing all relevant and important players on board to deliver and sustain PPP projects ([Fatokun *et al.*, 2015](#)).

Given the prevalent poor end-user stakeholder's engagement practices in many of Nigeria's PPP projects and the resultant obstacle to their successful growth (Du *et al.*, 2018); studies have, therefore, called for more attention from policy formulators, government and PPP practitioners to do more in ensuring better engagement with PPP end-users to gauge their perception, awareness and interest. Owolabi *et al.* (2020) argued that this approach will encourage and lead to improvement in the sense-of-belonging and communal ownership of projects amongst end-users; with regular interactions between communities and project organisations also helping to diffuse tensions and resolve confusions (Freeman, 2010). Nevertheless, whilst Nigeria's challenges regarding the end-users role in sustaining PPP projects over the longer term persist (Toriola-Coker, 2018); various researchers have done extensive studies on stakeholder management in PPP (Ogunsanmi, 2013; Amadi *et al.*, 2014; Osei-kyei and Chan, 2017, 2018). However, most of these studies have either concentrated on stakeholder issues in foreign countries such as UK, Australia, India, China, Indonesia, France and Brazil (Lv and El-Gohary, 2016; Hill Chung *et al.*, 2010; Harris, 2010; Akintoye *et al.*, 2011). The foreign context of these studies *vis-à-vis* the unique nature of African PPPs; and Nigeria, in particular, has undermined the wider applicability of most of these findings. In addition, whilst a lot of studies have also investigated end-users stakeholder management in Nigeria's PPPs (Toriola-Coker, 2020; Owolabi *et al.*, 2020; Oyedele, 2012a, 2012b), there is currently no literature investigating the critical role of community-level end-users in the long-term sustainability of PPP projects located within their communities. This, therefore, represents a huge gap in the existing body of literature, which this study intends to fill. Hence, the overall aim of this study is to investigate the critical roles and factors affecting end-users stakeholders contribute to the long-term sustainability of PPP projects in their communities, using a case study of two PPP road projects in Nigeria". To effectively examine this research aim, the following research questions will be asked and addressed in the study:

- RQ1. To investigate the challenges of PPP delivery in Nigeria and the marginalisation of end-users stakeholders using two PPP toll roads projects in Lagos, Nigeria as case studies.
- RQ2. To Investigate the critical role, impact and contributions of end-users towards successful delivery and long-term sustainability of PPP projects in local communities.
- RQ3. To identify the top key strategies for improving end-users role and contribution towards the long-term sustainability of PPP projects in Nigerian communities.

Significance of the study: This study has huge significance as it addresses the problems of end-user stakeholder opposition to PPP projects in Nigerian host communities. The study evaluates and identified critical factors that can enable the active involvement of end-user stakeholders towards promoting the long-term sustainability of PPP projects in their local communities.

2. Literature review

2.1 Evolution of public private partnership projects in Nigeria and contextual challenges

Despite the progress being made in Nigeria, with a current population of over 140 million and an annual growth rate of 2.4% (National Planning Commission, 2004), Nigeria still has daunting challenges with the delivery of essential public infrastructural facilities and basic amenities. This suggests the huge task ahead of Nigeria in terms of infrastructural

challenges (Ibrahim *et al.*, 2006). Although various efforts have been made in terms of enormous infrastructure investment by previous governments, socio-economic developments have continued to be elusive. Recently, suggested reports have shown that the country needs between US\$12bn to US\$15bn yearly for a protracted period of six years to fulfil the standard infrastructural requirements (Toriola-Coker, 2020; Owolabi *et al.*, 2020).

Against all the various infrastructural challenges faced by Nigeria, the popularity of PPP is, however, on the rise, especially in the area of roads construction, markets, estates, car parks including managing and operating of old infrastructural facilities such as conference centres (Abdul-Aziz, 2001; Levy, 1996; Ogunlana, 1997). In the past 10 years, over N10tn has been invested by the Federal, State and Local administration through PPPs in over 25 major infrastructural projects. This is in spite of the targeted N32tn investments in infrastructural facilities for achieving the country's vision 2020 (Alitheia, 2010). In furtherance to this developmental target, the Federal Government of Nigeria did put in place a number of enabling laws to regularise all contractual arrangements of PPP including the national policy on PPP, Infrastructure Concession Regulatory Commission (ICRC) Act of 2005; Public Procurement Act 2015; National Integrated Infrastructure Master Plan, etc. These laws are intended to facilitate the effective implementation of projects and private sector collaboration. As highlighted by Olusola *et al.* (2012), there is currently growing support and political will from the Nigerian Government at all levels towards developing the PPP as a mainstream procurement policy.

Perhaps the success story in Lagos state aptly exemplifies the huge strides that Nigeria is gradually making in PPP. Notably, the Lagos State Government kick started the introduction of PPP in Nigeria with the passage into Law of the Lagos State Roads, Bridges and Highway Infrastructure Development Board (2004). This infrastructure law, which has been supplemented with other procurement laws and compiled into what is now regarded as the Lagos State Public Procurement Law 2011, provides a framework for private sector involvement in the delivery of public infrastructures. Currently, Lagos State has implemented PPP procurement routes in various sectors such as power generation, maintenance of highways, waste disposal management amongst others. The successful implementation of these laws in the state has led to increased cooperation between private investors and the state government; and has yielded numerous dividends in the grey areas of infrastructural provisioning (Global legal group, 2007). However, whilst all might seem rosy on the surface for PPP development and delivery in Nigeria. New and emergent issues are pointing towards a challenging time for the government on PPPs, especially as it relates to the social acceptability of the PPP model and the end-user opposition and violence (Toriola-Coker, 2020).

For instance, the recent ENDSARS protest and the destruction of the Lekki Toll gates in Lagos Nigeria, amongst several other similar protests have provided clearer perspectives regarding end-users stakeholders' opposition towards PPP projects and the government as a whole. The protest which started as a protest against police brutality later culminated in the destruction of all the toll points, the infrastructure and the technology at the Lekki PPP tollgate due to end-users grievances against the Government. Other factors affecting PPP in Africa, according to Fatokun *et al.* (2015) are also weak credit-rating of many indigenous PPP sponsors usually give rise to sponsor risk, thus hindering their capacity to attract viable project partners (Mills, 2010). From foreign financiers' perspective, weak credit capacity of indigenous project sponsors discourages lenders from financing or compels them to reduce the size of the loan to invest in a project' (Owolabi *et al.*, 2020). In addition, other country-related challenges such as civil unrest, currency devaluation, leadership instability and weak legal framework for PPP, can also present real threats of political risk,

thus making African PPP unattractive to many investors (Bing *et al.*, 2005; Carrieri *et al.*, 2006; Busse and Hefeker, 2007). According to Kayaga (2008), expropriation and government repudiation of contracts are seriously limiting Africa's PPP growth, with 80% of PPP contracts attracting disputes and cancelled between 1990 and 2004. Such cancellations will have a negative impact on a nation's PPP initiative and dampen market confidence in the government's commitments (Ncube, 2010). Hence, researchers have argued for a more robust strategy in solving the end-user stakeholders' crisis to ensure project investments last longer and deliver intended benefits to communities (Lv and El-Gohary, 2016; Hill Chung *et al.*, 2010; Harris, 2010; Akintoye *et al.*, 2011).

2.2 Sustainability of public private partnership projects and the role of end-users stakeholders' in developing economies (Nigeria)

Construction and maintenance of public infrastructures in developing economies like Nigeria are persistently yearning for sustainability (Zawawi *et al.*, 2014). Sustainability has become such a catchword that can be described as in perpetuity or lasting approach to fortification (Bai *et al.*, 2017). The perception of maintainability in the current body of knowledge concerns not only environmental protection but also other components of sustainability, including social and economic sustainability, which cannot be ignored. As such, therefore, the concept of sustainability has been considered as a holistic and integrative approach to keep a balance between the three components of social, environmental and economic (Tunji-Olayeni *et al.*, 2020). For PPP projects, huge capital investments are typically needed for its execution. Two significant reasons for setting PPP procurement procedure different from traditional procurement method are established by some researchers (Carbonara *et al.*, 2016; Amadi, 2017) including as follows: ensuring much stronger competition to improve infrastructure quality and value for money and – the satisfaction of end-user stakeholders *vis-à-vis* their communities.

As the PPP model helps facilitate the delivery of public infrastructure facilities including roads, bridges, residential, power amongst others, there is an increasing but not necessarily positive impact on the economy, environment and society. Therefore, the balance between the three components of sustainability plays a significant role in the delivery of PPP projects. As, in PPPs, it is strongly recommended that the policymakers recognise the significance of end-user stakeholder's participation based on the triple-bottom-line, rather than the traditionally used measures focussing on time, cost and quality. This perspective has been corroborated by a paper delivered by Olson and Swenson (2011) and Xiao *et al.* (2013) during a construction conference in North America, where end-user stakeholders' critical role in PPP has been considered to be largely marginalised. Hence, it is important to do more research on end-user stakeholder's sustainability in any PPP road construction project (Mwakabole *et al.*, 2019).

According to Toriola-Coker *et al.* (2020), End-user stakeholders are described as the regular users of any infrastructure facilities. Unfortunately, most PPP end-users in developing nations like Nigeria have their wishes and desires yet to be fulfilled, especially as most remain unenlightened on the significance of sustaining such projects, as well as practices and procedures for ensuring long-term sustainability on projects (Ke, 2017). Various sustainability-assessment tools and methods have been introduced, particularly by advanced countries to assess the level of end-users stakeholders' performance in terms of adherence. For instance, in the UK, the Building Research Establishment Environmental Assessment Method was the first method for rating, assessing and certifying the sustainability of end-user stakeholders on infrastructure facilities (Whang and Kim, 2015). This is based on an overall score of the pass, good, very good, excellent and outstanding.

Failure to comply will arise to unprofessional behaviour, weak enforcement mechanisms, self-interest and inefficient regulatory frameworks amongst others (Mwakibinga and Buvik, 2013). The International Initiative for a Sustainable Built Environment developed the SBTool assessment method to rate the sustainability performance of end-user stakeholders, which focusses on the environmental, economic and social aspects of sustainability (Hashim *et al.*, 2020). The tools were able to assess and rate the performance in accordance to the awareness initiated by the private investors and government.

However, inadequate planning for end-user stakeholder in most of the developing country like Nigeria is a contributing factor to the mostly proposed PPP projects which continues to become more complex (Toriola-Coker *et al.*, 2020). The revelation came through a literature review that philosophy that keeps on encouraging the involvement of “citizen” such as end-user stakeholders is when the procurement officers requested contractors’ adherence to the participation of end-user stakeholders in design, planning and operation of infrastructure facilities (Arnstein, 2015). This involvement has been demonstrated in the hierarchy of citizen participation that was established by Arnstein (2015) in which end-user stakeholders’ participation must be in terms of control, power information and manipulation between the community and government. This is described by using a ladder chart as a symbol for growing access to managing power as depicted in Figure 1. These uphold their professional integrity and ethical code which demonstrates the general integration between community and government in power sharing, policy decision-making and preparation stages (Abel *et al.*, 2013; Mwelu *et al.*, 2018).

On the other hand, the commitment of all end-user stakeholders is mandatory to achieve sustainable practice. As the large variety of actors and the complexity of their interactions are predetermined, the end-user stakeholders’ involvement and participation can be enhanced through liberal awareness of the sustainable practice. Myers (2005) reviewed the practices to sustainability by the end-user stakeholders in the UK based on public disclosures and concluded that remarkably above the average of end-user stakeholders embrace sustainability and relatively few developing countries have changed the level of awareness of end-user stakeholders on sustainability. Realising the anticipated or targeted benefits from PPP projects, end-user stakeholders through literature review shows some intimidating challenges on sustainability during and after project completion (Akintoye *et al.*, 2011). From the literature review, the challenges encountered on economic benefit, environmental impact, benefit Realisation and community participation by end-user stakeholders on sustainability are subsequently discussed.

2.3 Community impact benefits

The community impact benefits are special effects that PPP road projects have on neighbouring communities, apart from those deliberately sustaining the direct users and travellers of transportation services (Greenfield *et al.*, 2015). They are frequently called community impacts or social impacts (Scharlach, 2012) because of their sustainable effects on neighbourhood liveability (the quality of residents that work, live or visit the environment) as a result of changes in views, noise, land use mix, walking environment and community unity i.e. the quality of communications amongst fellow neighbours (Appleyard *et al.*, 2014). Associated impacts on property values can also be involved (Greenfield, 2015) and divergence impacts on vulnerable population groups cannot be ignored. Academic researchers (Greenfield *et al.*, 2015; Norouzian-Maleki *et al.*, 2015; Walden, 2015) sighted some examples on how community impacts can influence end-users stakeholder’s interests as follows:

- Improve walking and cycling conditions in an environment and integrating landscapes such as pocket parks and walkways.
- Create opportunities for neighbours to interact with each other thereby increasing community unity.
- New road configuration creates an opening in locating markets, shops and offices in a dejected neighbourhood because of developments to get easy access and safety i.e. the effect on property and land use
- Creation of bus terminals reduces the effect of rainfall and sunlight, humanizing the views of the neighbourhood (visual effect).

All these mentioned impacts will create economic benefits for the end-user living along with the neighbourhood of the project.

3. Research methodology

To examine the research problem within the real-world setting, this study adopted a multiple-case study strategy. From the perspective of Creswell (2007), case study methodology involves examining a research problem through one or numerous cases in a confined system. This strategy, the study believed will allow multiple perspectives to be explored, thereby enriching the research findings (Baxter and Jack, 2008). On this basis, the study selected the as follows:

- Lekki-Epe PPP project and
- Apakun Muritala Muhammed PPP project as convenient case studies for investigating the research problem.

Whilst the Lekki Epe project is located under the Ibeju Lekki Local Municipal or local government; the Apakun project is located under the Lkeja Local Government municipal. However, both projects are located in Lagos State, Nigeria. Mixed research methods including in-depth interviews (qualitative) and questionnaire survey (quantitative) were adopted to investigate this study because it promotes a combination of methods that proffers the best solutions to research questions (Johnson and Gray, 2010). It also accommodates multiple methods of data collection and triangulation within a single study and avoids common weaknesses in either approach (Zhang *et al.*, 2013). Hence, this study leverages the exploratory sequential mixed method by first conducting In-depth interviews with experts on PPP projects who worked as staff during the implementation and operation of the PPP road projects. Qualitative data from the interviews were then analysed and later used to develop a questionnaire survey. This is then immediately followed with the distribution of a questionnaire survey of regular road users (commuters, drivers, transport union officials, private car owners and local communities in Lagos State, Nigeria. This, therefore, helped to obtain relevant quantitative data from the end-user stakeholders, especially those who are present during the implementation and operation of the case study PPP projects. Table 1 presents the characteristics of respondents that participated in the unstructured interview.

3.1 Phase-1

The first phase of the study involved unstructured interviews with experts in infrastructure project development and PPP implementation in Nigeria. The interviews were conducted over a period of 9-weeks between April 2019–June 2019. In all, nine in-depth interviews were conducted with experts. The aim of the interview was to identify the challenges each

respondent encountered that may threaten the long-term sustenance of the PPP project in their locality. The interviews were recorded using a digital recorder. Nvivo-12 software was used to transcribe and analyse the interview data. Using Thematic Analytical Technique, the study uncovered various implicit and explicit underlying end-users discontent and factors that may jeopardise the long-term sustainability of PPP projects in their local communities. Word frequency was also used to quickly identify potential codes before in-depth text reading and all words relating to a potential factor in the word frequency query search were noted and coded as well. Kindly see extracts of the thematic analysis codingscheme in [Table 2](#) below.

3.2 Phase-2

The Phase-2 of the study involved a questionnaire survey to wider audiences of end-users of the identified PPP projects in Lagos, Nigeria. Due to the absence of a uniform and publicly available database for survey respondents, a snowball sampling approach was used to recruit questionnaire respondents amongst end users of the PPP road projects. The questionnaire respondents included members of projects' host communities, commercial transporters i.e. drivers, passengers, transport union officials and workers, land-lords in local communities and other private road users (personal cars, trucks, etc.). A total of 150 questionnaires were distributed by hand to respondents over a period of 6 months from August 2019 to January 2020. Consequently, a total of 98 questionnaires were filled and returned suggesting about 65% of the distributed questionnaire being successfully-returned. The questionnaire data was extracted and processed using a blend of excel sheets and SPSS software. Using the SPSS tool, series of statistical analyses were performed on the extracted questionnaire data.

4. Results and data analysis

This section presents the results of qualitative and quantitative data analysis from the study. Based on the thematic analysis conducted on the interview data, the study examined the underlying themes in the data and presented the coding scheme in [Table 2](#) below.

Based on the thematic analysis, the study identified 33 end-user-related factors for ensuring the long-term sustainability of PPP projects in host communities. [Table 3](#) below presents the end-users-related factors for ensuring the sustainability of PPP projects in host communities.

4.1 Statistical analysis

End users' stakeholder's attitudes to project sustainability were grouped using statistical analysis of factors to be identified in the literature and expert opinion in achieving the objectives of the research. The data set were assessed for their reliability for the required

Table 1: Characteristics of unstructured interview participants/ respondents

Description of interview respondents	Case study "Project 1" number of interviews	Case study "Project 2" number of interviews	Total number of interviews conducted	Average no of years of using the PPP road
<i>PPP project organisation/company</i>				
• Project Engineers	2	0	1	5.5 years
• Project Managers	0	1	1	6.3 years
• Consultant	1	2	1	5.5 years

Table 2: Coding data showing challenges facing end-users stakeholders of PPP road project in Nigeria

Codes	Respondents	Comments (from the data, highlighted by the code)	Measures/themes (established from the comment)
Drainage and flooding	R3 R1 R4	<p>"This area is worse during the raining season with flood everywhere because of the drainage path that was not completed during construction"</p> <p>"Look at what happened recently during these massive flooding it took the state government over 24 h to respond to peoples call after their properties have been destroyed by water due to heavy downpour, this is not sustainable"</p> <p>"I think the government should do all the needful to provide more facilities most especially in the area of flooding that almost destroys their properties. The government can do that by clearing the entire drainage path along with the road and create more drainage channels that can accommodate excessive water"</p>	Improving local flooding and drainage works
Job creation	R2 R4 R5	<p>"Issue of job is another story, is it possible to give a job of construction to a lay person that does not have the technicalities? How do they sustain the job? The answer is capital no but the indigene is complaining of not giving them jobs during construction as if we don't want to comply with their fathers"</p> <p>"Honestly, the state government even at a stage compel us to call all the royal fathers in the community and asked them if they have anybody that has the experience of what we are doing on site, but nobody showed up"</p> <p>"Yes, the good road brought a lot of development, job opportunities and social life because there is a cinema inside the shopping mall that I am working. You don't need to go to anywhere before you get anything, if this one can be sustained, I think we're good to go"</p>	Creating jobs for the residents

statistical tests using the Cronbach alpha of the data set and also a test Kaiser–Meyer–Olkin (KMO) test of sampling adequacy and Bartlett tests sphericity. Cronbach's alpha coefficient is used in this study to test and examine the reliability of the questionnaire data. Mathematically, Cronbach's alpha is written as follows:

$$\alpha = \frac{1}{n} \frac{\sum_{i=1}^n \sum_{j=1}^n r_{ij}}{\sum_{i=1}^n r_{ii}}$$

The test was aimed at checking the regularity of the obtained data to find if the variables and their associated Likert scale are really evaluating the hypothesis they were proposed to measure (Field, 2013). The hypothesis, in this case, is the title given to each number of variables as related to the challenges encountered by the end-users stakeholders in both

Table 3: End-users-related factors for ensuring the sustainability of PPP projects in host communities

S/N	End-users-related factors for ensuring the sustainability of PPP projects in host communities
E1	<i>Creating jobs for residents</i>
E2	<i>Improving local flooding and drainage works</i>
E3	<i>Royalties for indigenes (compensation)</i>
E4	<i>Repair of local minor roads leading to important places such as market, beaches and other recreational areas</i>
E5	<i>Giving incentives to local residents during road work</i>
E6	<i>Putting proper road work signage in place to increase safety</i>
E7	<i>Avoiding the damage of (or replacing damaged) natural habitats such as water ponds, mangroves and forest</i>
E8	<i>Installation of speed limiting devices on both main and alternative routes</i>
E9	<i>Making provisions for crossing structures</i>
E10	<i>Compensation of electricity for removal of electric poles and overhead cables</i>
E11	<i>Create special crossings for school children</i>
E12	<i>Make effort to reduce cement and other types of dust so as to avoid inhalation by members of the host community</i>
E13	<i>Avoiding displacement and killing of wildlife and endangered species</i>
E14	<i>Avoiding local water pollution</i>
E15	<i>Increase restriction efforts on roads during and after construction so as to increase safety</i>
E16	<i>Noise level and air pollution</i>
E17	<i>Providing water wells for communities whose water supply are disrupted due to construction works</i>
E18	<i>Involvement of Community leaders in key decisions</i>
E19	<i>The choice of route for the road in terms of minimal physical effect (e.g. demolition of buildings) on local properties and businesses</i>
E20	<i>Involvement of Residents in key decisions</i>
E21	<i>Reduction of impact to cultural sites</i>
E22	<i>Involvement of Religious leaders in key decisions</i>
E23	<i>Provision of the alternative route during construction to ease traffic</i>
E24	<i>Reduction of disruption of community access</i>
E25	<i>Involvement of private firms within the community in key decisions</i>
E26	<i>Make efforts to stop the increase in the cost of living and provide basic infrastructure</i>
E27	<i>Involvement of Youth leaders in key decisions</i>
E28	<i>Contractor should contribute to the improvement of security in the host community as construction works lead to security risk</i>
E29	<i>Consideration of the community for timings of roadblocks created to carry out construction works</i>
E30	<i>Involvement of Royal fathers in key decisions</i>
E31	<i>Compensations to affected buildings and adjacent areas such as lands, shops and petrol stations</i>
E32	<i>Involvement of Women leaders in key decisions</i>
E33	<i>Travel time during and after construction</i>

targeted areas. The coefficient of Cronbach's alpha value ranges from 0 to 1 and as a thumb rule, 0.9 and above represent high consistency, but 0.8 was described as a sign of good internal consistency (reliability) whilst 0.7 is recommended as the lowest acceptable score (George and Mallery, 2003). Table 4 presents the Cronbach's alpha coefficient test results gotten from SPSS. The reliability test was run and the overall Cronbach's alpha coefficient was obtained with variables more than 0.8 portraying good internal consistency of the data.

To check if all the variables are contributing to the internal consistency of the data, the "Cronbach's alpha if item deleted", positioned in column three of Table 4 below is further examined. Based on its rule, any variable that is not contributing to the overall reliability from the sets of variables will generally have a higher value of "Cronbach's alpha if item deleted" than the overall Cronbach's alpha coefficient (Field, 2013). Based on this analysis, five factors that were not contributing to the overall reliability and internal consistency of the data were deleted from the data set. These include as follows: E3 = Royalties for Indigenes as compensation; E10 = Compensation of electricity for removal of electric poles and overhead cables; E13 = *Avoiding displacement and killing of wildlife and endangered speeches*; E21 = *Reduction of impact on cultural sites* and E28 = Contractor should contribute to the improvement of security in the host community as construction works lead to security risk. These factors are boldly written in italics in the table below.

4.2 Exploratory factor analysis for end-users stakeholders challenges along with project route

To ensure that the data is suitable for factor analysis, two important statistical tests were performed. These are KMO test of sampling adequacy and Bartlett tests of sphericity. Whilst the KMO statistic examines the proportion of variable in the variables that is caused by underlying factors which could indicate its suitability for factor analysis (Field, 2013); Bartlett tests examine the existence of any redundancy in the variables that can be summarised with a number of factors (Toriola-Coker *et al.*, 2021). Should the KMO value be less than 1, this indicates the data may not be entirely measuring the construct (Field, 2013) whilst KMO closer to 1 is generally favoured as a sign of adequacy of the data set for factor analysis. The result of the KMO and Bartlett's statistical tests generated values of 0.793 (above 0.5) and 0.0003649747 (less than 0.05) as shown in Table 5, signifying that the data set is appropriate for factor analysis and the sampling is satisfactory (Pallant, 2013). According to Pallant (2013), the closer the KMO value to one, the more appropriate the use of factor analysis.

Furthermore, the study needed to explore and ascertain whether the data set contained any underlying structure or variability in correlated items. Hence, series of factor extraction analysis ranging from the "maximum likelihood", "principal component", "generalised least squares" and "principal axis factoring" methods were performed. This was done with the aid of SPSS. They were used in sequence at the initial stage to extract the factors in an attempt to choose the precise number of factors to be extracted. All methods resulted in a total number of eight factor-structure. The factor analysis used a minimum Eigenvalue of 1 to select the underlying factor, but the computation using "maximum likelihood" did not converge at the possible maximum number of iterations for SPSS which is 9,999. This was as SPSS attempted to extract nine factors as shown in Factor Matrix as follows:

Factor Matrix^a

a = Attempted to extract eight factors. In iteration 9,999, no local minimum was found.

Extraction was terminated.

Table 4: Reliability test formotivating factorsfor end-user stakeholders’ contribution towardslong-term sustainability of PPPprojects in host communities

S/N	Variables	Cronbach’s alpha if item deleted
	<i>Overall Cronbach alpha = 0.882</i>	
E1.	<i>Creating jobs for residents</i>	0.879
E2.	<i>Improving local flooding and drainage works</i>	0.880
E3.	<i>Royalties for indigenes (compensation)</i>	0.885
E4.	<i>Repair of local minor roads leading to important places such as market, beaches and other recreational areas</i>	0.877
E5.	<i>Giving incentives to local residents during road work</i>	0.879
E6.	<i>Putting proper road work signage in place to increase safety</i>	0.874
E7.	<i>Avoiding the damage of (or replacing damaged) natural habitats such as water ponds, mangroves and forest</i>	0.882
E8.	<i>Installation of speed limiting devices on both main and alternative routes</i>	0.874
E9.	<i>Making provisions for crossing structures</i>	0.879
E10.	<i>Compensation of electricity for removal of electric poles and overhead cables</i>	0.886
E11.	<i>Create special crossings for school children</i>	0.874
E12.	<i>Make effort to reduce cement and other types of dust so as to avoid inhalation by members of the host community</i>	0.876
E13.	<i>Avoiding displacement and killing of wildlife and endangered species</i>	0.883
E14.	<i>Avoiding local water pollution</i>	0.882
E15.	<i>Increase restriction efforts on roads during and after construction so as to increase safety</i>	0.874
E16.	<i>Noise level and air pollution</i>	0.877
E17.	<i>Providing water wells for communities whose water supply are disrupted due to construction works</i>	0.878
E18.	<i>Involvement of community leaders in key decisions</i>	0.879
E19.	<i>The choice of route for the road in terms of minimal physical effect (e.g. demolition of buildings) on local properties and businesses</i>	0.879
E20.	<i>Involvement of residents in key decisions</i>	0.879
E21.	<i>Reduction of impact to cultural sites</i>	0.883
E22.	<i>Involvement of religious leaders in key decisions</i>	0.878
E23.	<i>Provision of the alternative route during construction to ease traffic</i>	0.877
E24.	<i>Reduction of disruption of community access</i>	0.876
E25.	<i>Involvement of private firms within the community in key decisions</i>	0.878
E26.	<i>Make efforts to stop the increase in the cost of living and provide basic infrastructure</i>	0.876
E27.	<i>Involvement of youth leaders in key decisions</i>	0.877
E28.	<i>Contractor should contribute to the improvement of security in the host community as construction works lead to security risk</i>	0.885
E29.	<i>Consideration of the community for timings of roadblocks created to carry out construction works</i>	0.875
E30.	<i>Involvement of royal fathers in key decisions</i>	0.880
E31.	<i>Compensations to affected buildings and adjacent areas such as lands, shops and petrol stations</i>	0.878
E32.	<i>Involvement of women leaders in key decisions</i>	0.880
E33.	<i>Travel time during and after construction</i>	0.877

Finally, the precise factor extraction that converged was the “principal component” method and “direct oblimin” oblique rotations which were used as methods of factor extraction and rotation, respectively. Having noticed that rotation did not converge with the default 25 iterations setting during the initial extractions, a value of 50 was entered for “maximum iterations for convergence” in the rotation dialogue box. [Table 6](#) below presents the result of the factor analysis.

Results from the factor analysis identified the Top-7 motivating factors influencing end-users towards contributing to the long-term sustainability of PPP projects in the host communities include as follows:

- 4.1.1 Safety efforts by the contractor;
- 4.1.2 Socio-economic impact;
- 4.1.3 Benefits realisation and community participation;
- 4.1.4 Impact on cultural sites;
- 4.1.5 Environment impact;
- 4.1.6 Public utility compensation; and
- 4.1.7 Integration with the host communities.

5. Discussion of findings

5.1 Safety efforts by the contractor

Based on results from factor analysis, the most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is “Safety Efforts by the Contractor” with an Eigen value of 7.762. The present tendency is for governments and private organisation to assign significant needs to end-users stakeholders who do not understand the maintenance of infrastructure ([Gangwar and Raghuram, 2015](#)), thereby accepting sole responsibility creating awareness with guiding principles on sustainability ([Ibem and Onyemaechi, 2018](#)). However, this is in accordance with the stakeholder accountability theory, which presumes the allocation of stakeholder welfare between both parties ([Freeman, 2010](#)). These are the crusade that has been repeatedly echoed to the private sector so as to morally oblige the end-user stakeholders in project planning.

5.2 Socio-economic impact

Going by results from the factor analysis, the second most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is “Socio-Economic” with an Eigen value of 2.921. Regarding this paper, both Lekki-Epe and Apakun Muritala Muhammed PPP toll roads Project Company in association with the Government did not involve Community Stakeholders throughout the project. At times, the mere fact that private sector companies are taking over government roles may aggravate public resistance ([Ng et al., 2013](#)). Community involvement and consultations from the project area were carried out to support the compilation of the views of end-users

Table 5: KMO and Bartlett's

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.793
Bartlett's test of sphericity	Approx. Chi-square	0.0003649747

Table 6: Extracted factors from factor analysis for end-users stakeholders

S/N	Motivating factors for end-user stakeholders' contribution towards long-term sustainability of PPP projects in host communities	Factor loading	% of variance	Eigenvalue	Factor assigned name
	<i>Offspring variables of first extracted factor</i>				
E1	Putting proper road work signage in place to increase safety	0.808	23.521	7.762	Safety efforts by the contractor
E2	Installation of speed limiting devices on both main and alternative routes during construction	0.730			
E3	Making provisions for crossing structures	0.446			
E4	Create special crossings for school children	0.574			
E5	Make effort to reduce cement and other types of dust so as to avoid inhalation by members of the host community	0.562			
E6	Increase restriction efforts to the construction site so as to increase safety	0.656			
	<i>Offspring variables of second extracted factor</i>				
E7	The choice of route for the road in terms of minimal physical effect (e.g. demolition of buildings) on local properties and businesses	-0.535	8.850	2.921	Socio-economic impact
E8	Provision of the alternative route during construction to ease traffic	-0.748			
E9	Reduction of disruption of community access	-0.575			
E10	Make efforts to stop the increase in the cost of living and provide for basic infrastructure	-0.743			
E11	Consideration of the community for timings of roadblocks created to carry out construction works	-0.622			
E12	Compensations to affected building and adjacent areas such as lands, shops, petrol stations and	-0.539			
E13	Travel time during and after construction	-0.723			
	<i>Offspring variables of third extracted factor</i>				
E14	Creating jobs for residents	0.675	5.694	1.879	Benefit realisation and community participation
E15	Improving local flooding and drainage works	0.709			
E16	<i>Royalties for indigenes (compensation)</i>	0.494			
E17	Repair of local minor roads leading to important places such as market, beaches and other recreational areas	0.722			
E18	Giving incentives to local residents during road work	0.651			
E19	<i>Reduction of impact to cultural sites</i>	0.674	5.415	1.787	

(continued)

S/N	Motivating factors for end-user stakeholders' contribution towards long-term sustainability of PPP projects in host communities	Factor loading	% of variance	Eigenvalue	Factor assigned name
	<i>Offspring variables of fifth extracted factor</i>				
E20	Avoiding the damage of (or replacing damaged) natural habitats such as water ponds, mangroves and forest	0.863	4.414	1.457	Environmental impact
E21	<i>Avoiding displacement and killing of wildlife and endangered species</i>	0.446			
E22	Avoiding local water pollution	0.378			
E23	Noise level and air pollution	0.308			
	<i>Offspring variables of sixth extracted factor</i>				
E24	<i>Compensation of electricity for removal of electric poles and overhead cables</i>	0.781	4.046	1.335	Public utility compensation
E25	Providing water wells for communities whose water supply are disrupted due to construction works	0.398			
	<i>Offspring variables of seventh extracted factor</i>				
E26	Involvement of community leaders in key decisions	0.513	3.881	1.281	Integration with the host community
E27	Involvement of residents in key decisions	0.550			
E28	Involvement of private firms within the community in key decisions	0.377			
E29	<i>Involvement of youth leaders in key decisions</i>	0.343			
	<i>Offspring variables of eighth extracted factor</i>				
E30	Involvement of Royal fathers in key decisions	0.577	3.579	1.181	Integration with political groups
E31	Involvement of women leaders in key decisions	0.766			
E32	Involvement of religious leaders in key decisions	0.365			
E33	<i>Involvement of youth leaders in key decisions</i>	0.427			

stakeholders living along with the project road for effective survey computations (Lv and Elgohary, 2016). In addition, unstructured consultations were carried out with transport operators (private cars, public transporters, office workers, amongst others) for interviews. Community leaders, affected men and women were also involved in the discussion on how the PPP road project has directly or indirectly sustained their businesses. The social acceptability of the project was initially unwelcoming given with the potential long and short-term undesirable impacts such as loss of income and properties amongst others (Loosemore and Cheung, 2015).

5.3 Benefit realisation and community participation

Going by results from the factor analysis, the third most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is “Benefits realisation and community participation” with an Eigen value of 1.879. Several authors have shown that capital venture in a PPP road infrastructure project may perform as a facilitator for social transformation and economic growth (Cervero and Kang, 2011; Kim *et al.*, 2014; Neuman and Smith, 2010; Padeiro, 2013). The method of living is changing as the stakeholders in the community areas increases, generating a need for a bigger environment (Atkinson and Blandy, 2013). The findings included the changes that are expected from the built environment which is potentially associated with the new Lekki-Epe and Apakun Muritala Muhammed toll roads. These apprehensions reveal the risks stakeholders perceived concerning the undesirable effect of PPP road infrastructure development. The only potential way of alleviating these fears is to create awareness on how provided infrastructure can be sustained (Pennanen *et al.*, 2013). The prominence of trust in human dealings has been established a long time ago with several research efforts carried out in various disciplines (Padeiro, 2013). The number of local people who could gain employment if properly trained is numerous. This shows that community residents pay more attention to various concerns on the infrastructure development when it happens closer to them and when they presume to have more individual relevance. Financial opportunities for local contractors within the project arena who may be contracted to provide services such as transportation, supply of sand and other construction materials are not trained (Huong *et al.*, 2012). The uses of foreign workers worsen the situation of sustainability knowledge with the local residents, where the end-users stakeholder does not understand the importance of sustainability (Guerra *et al.*, 2012). These situations created dissatisfaction and local frustrations amongst the end-user stakeholders. The failure to hire community artisans during the construction of the toll roads resulted to frustrations at the local level, especially considering that unemployment that was already very high in the neighbourhoods still persists.

5.4 Mitigating impact on existing local infrastructure

Going by results from the factor analysis, the fourth most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is “Impact on cultural sites” with an Eigen value of 1.787. Over the years, large-scale of flooding have been recorded in UK, Mexico, Australia, the USA, Thailand and Brazil (Pedrozo-Acuña *et al.*, 2017). For road infrastructure, high water levels and floods can considerably affect both the lifetime and performance of community stakeholders, as these actions encourage the number of occurrences such as roads being washed away, landslips, submerged and inundated bridge supports, landslides and road closures (Zumrawi, 2016). Hence, sustaining the existing structure (such as roadways) is essential to alleviate the effect of these menaces. Though climate circumstances are usually considered when planning

transport infrastructure schemes (e.g. road drainage), which can sustain the environmental effect of a community. The two study areas are essentially important for such exercise. The significance of this infrastructure makes it important for end-user stakeholders' participation in sustaining the provided facilities for future use. Upgrading of the road normally causes some temporary changes in drainage systems during the construction phase, particularly where culverts are yet to be replaced or installed (Zumrawi, 2016). The existing drainage path of the two considered project arenas was narrow and upgrading works involved extending the cross-section on both sides of the road which really hampered the movement of community stakeholders. Some of the factors that induced roadway floods can be categorised into social (human-related effects) or natural (rainfall), predominantly heavy rainstorm which is the major cause that trigger and magnify the rare presence of water on road network (Ou-Yang *et al.*, 2015).

5.5. Mitigating environmental impact of projects on end-users

Going by results from the factor analysis, the fifth most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is "Environmental Impact" with the Eigen value of 1.457. Roads construction is a fundamental fragment of modern transportation networks and considerable effort has been done to develop systems that will produce low-cost road alignments through the ideal environment that will integrate several genuine features and limitations (Kang *et al.*, 2012). Nevertheless, roads constructions also affect neighbourhood wildlife inhabitants (Jones *et al.*, 2014; Friedrich, 2015) and in specific circumstances, these effects are the determining factors in final road design selection (Kang *et al.*, 2012). Hence, it is essential to accurately justify for these ecological impacts during the optimisation process of road alignment. Likewise, sustainability of ecological representations can justify for several negative effects of roads construction, they presently emphasis only on overall policy recommendations or existing roads (Friedrich, 2015). As animal inhabitants can be extremely thoughtful to the definite route taken by a road, it is respected that these ecological representations be integrated during the design of a new roadway. This will permit road designers to ascertain original alignments as much as preserving the protracted period of ecological sustainability of new roads along with the project area (Mondal *et al.*, 2015).

5.6 Ensuring compensation for damage on public utilities

Going by results from the factor analysis, the sixth most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is "Public Utilities Compensation" with the Eigen value of 1.335. The residue is the most substantial pollutant from the construction site as it could possibly disturb all the three scopes of sustainability such as social, environmental and economic concurrently (Ab Rahman *et al.*, 2010). The developed structure and the economic layout of the project area should be accustomed according to assets, environmental capacity and source of energy (Ahmad *et al.*, 2014). The level of sediments emanated from the construction site is huge, which normally released to water bodies or occupies the whole land (Jeffress *et al.*, 2011). Sediments control facilities and the use of structurally-based erosion are commonly used to reduce the danger of water pollution from the construction site (Teng *et al.*, 2011). The water level of the entire project area is very high, although the normal operations of the road construction were not expected to impend resources the damage of the herbaceous shield following the development of construction sites had affected the surface water regime of the project communities (Armah *et al.*, 2013). Water pollution can be avoided by erecting and installation of control facilities such as dewatering, contour drain, silt fence; flocculation and

retention ponds (Al-Ani *et al.*, 2014; Ahmad *et al.*, 2014). This influences the risks of quality water (due to pollution as a result of discharge of pollutants and waste water), river sedimentation, soil erosion, stagnation of water in borrow sites, landslides, silting of soils, contamination of the water points used by stakeholders (McPhee and Aird, 2013).

5.7 Integration with host communities

Going by results from the factor analysis, the seventh most important motivating factor influencing end-users towards contributing to the long-term sustainability of PPP projects is “integration with host communities” with the Eigen value of 1.281. An incessant development in vehicular traffic in several years back has necessitated the construction of the extension of existing roads or a new road to improve upgraded transportation systems in Nigeria (Babatunde *et al.*, 2016). However, much research has shown influences of either noise or ambient air pollution on health (Basner *et al.*, 2014), insufficient studies have examined the two environmental experiences together. The growth of an environmentally and competent sound transportation network has presumed much better significance in Nigeria in the mission to realise the excellent urban life of end-users stakeholders of a community (Opawole and Jagboro, 2016). Although, for efficient avoidance of health risk it is essential to know whether environmental experiences are influencing health outcomes autonomously and whether impacts of noise and air pollution are co-operative or even protective specifically because of their happening concurrently (Foraster, 2013). Evaluating the environmental effects of such mammoth developmental projects would assist to determine the greater environmental stability and objectives of improved safety for the current and upcoming stakeholders of the community (Chen *et al.*, 2017). Intellectual utility happens to be one of the results that were proposed when traffic noise and air pollution affect any stakeholders (Basner *et al.*, 2014; Block *et al.*, 2012). Air pollution and noise level are the most dangerous impacts that could be expressed during project operation. These are expected and are unavoidable especially during the construction phase of the project even after construction. The environmental effects due to road construction are provisional in nature and these would affect the community stakeholders along with the project arena (Prince *et al.*, 2013). Such effects are affected due to various road construction activities and the movement of earthmoving equipment.

6. Conclusion and recommendations

PPP in construction infrastructure has gained significant attention in developing countries following its achievement in the developed countries. To sustain infrastructure for end-user stakeholders, both the government and private investors needed to create awareness that will entail introducing sustainability practices into the built environment and construction programmes in the Nigeria communities. This paper has delved into factors for enabling the contribution of end-user stakeholder's in the helping to sustaining Nigeria's PPP road projects in the long-term. The study found safety efforts by the contractors; the social economic impact of the project; and benefit realisation *vis-à-vis* community participation are at the top three factors at the core of strategies that can help end-users key into sustaining PPP projects in Nigeria's host communities in the long-term. The study concluded that creating jobs for residents; Improving local flooding and drainage works; Repair of minor local roads; Avoid damaging of (or replacing damaged) natural habitats; Avoiding local water pollution and Noise level and air pollution are factors that will enhance the end-user stakeholders of the community to participate in sustainably maintaining PPP projects in their communities. Based on the above findings, the following recommendations can be made for key stakeholders that the need to include sustainability strategies right from the design and its inclusion in the contract cannot be underestimated especially in Nigeria and in other part of the world where contract dictates the tune on how construction projects are delivered. Additionally, motivations (financial and non-financial) are vital for improving the practice of sustainable construction. For

example, the government can create awareness right from the wards, local government and state level on sustainable strategies. The findings of the current study contribute to the existing body of knowledge on the barriers to SCP from the context of the Nigerian construction industry. Although the current study is limited to the view of construction stakeholders and practitioners in the Lagos metropolis, the study provides valuable insights on the strategies reducing stakeholder opposition to PPP projects and factors motivating their long-term buy-in towards ensuring maintainability and long-term sustainability of projects in host communities.

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