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RESEARCH ARTICLE

Success Factors of the Consultant Selection Stage of the Ghanaian Public Construction Projects: The Road Sector's Perspective

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Abstract

The success of the Ghanaian public road construction phase and other preconstruction phases has been studied. However, the success of the Ghanaian public road project consultant selection phase has not received any attention, even though it is prone to corruption. The goal of this study is to identify the critical success factors (CSFs) that, from the standpoint of a developing country, affect the success of the Ghanaian public road consultant selection phase. Data on the degree to which key success criteria identified in literature have an impact on the success of the Ghanaian public road consultant selection phase from the viewpoints of 156 sector practitioners in Ghana were acquired using a self-administered questionnaire. After that, the relative importance index was used to analyse the data. According to the study, external environmental, project management, and procurement-related factors influence the success of the Ghanaian public road consultant selection phase. The government and organizations that administer public construction projects will now have a better grasp of the CSFs that affect the performance of the Ghanaian public road construction project consultant selection phase and be able to use

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them as a guide to improve the effective and efficient delivery of public road construction projects. In managing public road projects, the study's findings will be useful to both industry professionals and the Ghanaian government. The study is limited to the consultant selection phase of Ghanaian public road construction projects.

Keywords

Critical Success Factors; Construction; Consultant Selection Phase; Construction Management; Relative Importance Index

Background

Construction projects are planned attempts to develop a structure or a building. Construction projects entail the tangible assembly of a building or infrastructure in the disciplines of civil engineering and architecture (Amoah, Berbegal Mirabent and Marimon Viadiu, 2021). These projects frequently involve numerous contractors, each of whom has a certain agenda and job requirements (Jenkins and Wallace, 2016). A significant portion of the economy of many developing economies (DEs) is based on the administration of construction projects. Many nations invest significant resources in ensuring the successful management of construction projects due to their importance to society (Kandelousi, et al., 2011). For instance, the construction industry has had a significant positive impact on the gross domestic product (GDP) and employment of the Ghanaian economy. According to the Ghana Statistical Service (GSS), the sector's average GDP contribution between 2009 and 2013 was 14.34%. (GSS, 2018). According to Radujkovia and Sjekavicab (2017), a construction project is successfully managed when it achieves its goals while adhering to a predetermined schedule, cost, and quality standards. Construction project management and control are crucial to their performance, but most project-oriented companies in DEs do not always manage these projects in a way that guarantees success (Alias, et al., 2014). Poor planning, inaccurate project execution and implementation, cost overruns, and failure to fulfill project timelines and quality criteria are common issues with construction project management in DEs (Alias, et al., 2014). There is no question that each administration in a DE has a responsibility to provide the necessary infrastructure, including hospitals, schools, roads, latrines, etc. Given the strong demand brought on by growing urbanization, it is not a surprise that governments in these nations are currently investing in construction projects such as schools, bridges, rail, roads, etc. (Amoah, Berbegal Mirabent and Marimon Viadiu, 2021). However, many of these state-funded projects that are frequently found in numerous DEs are abandoned (Rasul and Rogger, 2018).

The majority of Ghana's budget statements have prioritized development projects that are a part of the country's construction industry (Damoah and Akwei, 2017). Ofori-Kuragu, Owusu-Manu and Ayarkwa (2016) found that in most situations, the results of these projects' implementation fell short of the deadlines, budgets, and quality standards set by clients and the project team members themselves. Also, Damoah and Kumi (2018) profess that many construction projects in Ghana fall short of their intended goals and, in other cases, are completely abandoned. However, few studies have examined the effects of critical success factors (CSFs) on public road construction projects in poor countries (Damoah, Ayakwa and Twum, 2022; Barajei, et al., 2023). Also, the procurement system for Ghanaian public construction projects is based on the traditional procurement method bequeathed by British colonial masters (Boadu, Wang and Sunindijo, 2020). Under this, the public construction project life cycle comprises the conceptualization and planning, consultant selection, design, contractor selection, and construction phases. The cumulative impact of meeting success criteria across a project's life cycle determines its success (Barajei, et al., 2023). Barajei, et al. (2023) postulate that a project's overall duration might be affected negatively or favourably, for example, by the delay or timely completion of any of the phases. Meanwhile, studies on the success of the consultant selection phase of Ghanaian public road construction projects do not exist. However, the contract phase of

construction projects is prone to corruption and political interference (Owusu, Chan, and Ameyaw, 2019; Adindu, et al., 2020; Osei-Tutu, Badu and Owusu-Manu, 2010; Ameyaw, et al., 2017). Thus, the objective of this study is to identify the success factors of the consultant selection phase of Ghanaian public road construction projects.

Literature Review

This section reviews literature on the classification of CSFs for the study and empirical studies on CSFs.

CRITICAL SUCCESS FACTORS CLASSIFICATION

According to De Wit (1988) and Cooke-Davies and Arzymanow (2003), CSFs are project management systems' inputs that must be controlled to ensure project success. Kerzner (1998) discovered that CSFs assist in identifying the aspects of projects that are essential to achieving the customer's desired deliverables. Key terms in project management include CSFs and success criteria. Yong and Mustaffa (2012) assert that CSFs can differ from region to region or industry to industry and are influenced by elements including operating environment, rules, and regulatory restraints. Thus, the classification of CSFs by Barajei, et al. (2023) for the Ghanaian public road construction projects shown in Table 1 is adopted for this study.

Table 1. Classification of Success Factors

S/N	Construct	Variables	Source(s)
1	Project Management Factors (PMF)	Top management support	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah, et al. (2019); Damoah and Kumi (2018)
2		Team capability	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Asiedu and Adaku (2019); Damoah, et al. (2019); Damoah and Kumi (2018)
3		Effective planning	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah, et al. (2019); Damoah and Kumi (2018)
4		Project management structure	Chan, et al. (2004); Asiedu and Adaku (2019); Damoah, et al. (2019); Damoah and Kumi (2018)
5		Cashflow	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Arafat and Skaik (2016); Asiedu and Adaku (2019); Damoah, et al. (2019); Damoah and Kumi (2018)
6		Effective supervision	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Asiedu and Adaku (2019); Damoah, et al. (2019); Damoah and Kumi (2018)
7		Adequacy of design	Damoah, et al. (2019); Amoatey and Ankrah (2017); Yong and Mustaffa (2012)

Table 1. continued

S/N	Construct	Variables	Source(s)
8		Team members' commitment	Belassi and Tukel (1996); Yong and Mustaffa (2017); Ogunlana (2008)
9		Transfer of experience and best practice	Alsulamy, et al. (2014)
10		Feasibility study	Damoah, et al. (2019); Amponsah (2010); Damoah and Kumi (2018)
11		Adequately defined task	Amponsah (2010); Clarke (1999)
12		Communication	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Asiedu and Adaku (2019); Damoah and Kumi (2018); Chan, et al. (2004)
13	External Environmental Factors (EEF)	Controlled Political interference	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah, et al. (2019); Damoah and Kumi (2018)
14		Stable government	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah, et al. (2019); Damoah, et al. (2022)
15		Availability of equipment	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah and Kumi (2018); Damoah, et al. (2022)
16		Economic (stable economic conditions and economic policy)	Chan, et al. (2004); Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Asiedu and Adaku (2019)
17		Fighting corruption	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Asiedu and Adaku (2019); Damoah, et al. (2019)
18		Availability of materials	Asiedu and Adaku (2019); Damoah and Kumi (2018); Damoah, et al. (2022)
19		Favourable weather	Asiedu and Adaku (2019); Amponsah (2010); Damoah, et al. (2022)
20		User involvement	Damoah and Kumi (2018); Amponsah (2010); Damoah, et al. (2022)
21	Procurement-related Factors (PRF)	Minimize bureaucratic procurement process	Damoah, et al. (2019); Damoah and Kumi (2018); Amponsah (2010)
22		Transparent procurement process	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Alsulamy, et al. (2014); Young and Mustaffa (2017)

Table 1. continued

S/N	Construct	Variables	Source(s)
23		Works specifications	Jackson (1990); Asiedu and Adaku (2019); Damoah, et al. (2019); Amponsah (2010); Jeptepkeny (2015)
24		Procurement method	Amoah, Berbegal Mirabent and Marimon Viadiu (2021); Damoah and Kumi (2018)
25		Contractual terms and conditions	Nguyen and Chilieshe (2015); Osei-Tutu, Badu and Owusu-Manu (2010); Ameyaw, et al. (2017); Owusu, Chan and Ameyaw (2019)
26		Project requirements	Amponsah (2010); Eriksson and Westerberg (2009); Jeptepkeny (2015)

Source: Barajei, et al. (2023)

Typically, time, cost, and quality have been identified as success criteria by several researchers. In project management literature, the three requirements are together referred to as the "iron triangle" (Atkinson, 1999; Pollack, Helm and Adler, 2018). Some researchers (Crane, et al., 1999; Heravi and Ilbeigi, 2012) have utilized additional factors, such as safety performance, stakeholder satisfaction, and dispute status, to assess a project's performance.

EMPIRICAL REVIEW

Although there have been several studies on road infrastructure projects, not much has been done in terms of road projects' CSFs in Sub-Saharan African nations (Damoah, et al., 2022). Additionally, studies done on CSFs in road construction projects have centred heavily on the use of PPPs (Chou, et al., 2012; Gupta and Narasimham, 1998; Chan, et al., 2010; Debela, 2019; Ng, Wong and Wong, 2012; Babatunde and Perera, 2017; Zhang, 2005; Singh and Kalidindi, 2006; Thomas, Kalidindi and Ganesh, 2006; Mwelu, et al., 2019; Damoah, et al., 2022). Through a questionnaire survey and a series of expert interviews conducted in Hong Kong, Ng, Wong and Wong (2012) identified the crucial success factors to be evaluated at the initial stage of PPP projects as perceived by the public sector, a private consortium, and the general community to achieve a "triple win" scenario. According to the survey findings, an acceptable level of tariff is the most important consideration when assessing the viability of PPP projects, particularly for the public. The public sector and private consortia have placed cost-effectiveness and financial attractiveness as the two most crucial evaluation variables, respectively. Additionally, there must be (i) a long-term need for the proposed services, (ii) a strong private consortium must be available, (iii) the proposed services must be in line with the strategic goals of the government, and (iv) service delivery must be reliable. Four components makeup Wang's (2015) framework for PPP evolution: CSFs for PPP, rising risks because of inadequate CSFs, corresponding risk management to change/improve the CSFs, and modified PPP models. The external environment, internal project characteristics, and partnership-related factors are the three components of the CSFs for PPP in this instance. The study discovered that public institutions' risk management successfully explains the evolution of PPPs. This was established using six American toll road development projects established in the 1980s as a confirmatory empirical study. To further examine the impact of CSFs on project performance in PPP projects, Ahmadabadi and Heravi (2019) additionally used two cases of highway projects in Iran. They discovered that CSFs have a direct impact on project success. However, during the project's construction phase, the private sector's capability directly influences its success, but the government's capability is effective during the operational stage. Debela (2019) used a more thorough cross-

sectional and in-depth analysis of the CSFs of PPP road projects in Ethiopia to present more convincing findings. Debela (2019) when considering 26 CSF of PPP in Ethiopian road projects, identified the following factors as crucial: (i) a supportive legal framework, (ii) transparency in the procurement system, (iii) a stable social and political environment, (iv) good governance, (v) an environment that is conducive to PPPs, and (vi) a functioning public. Although these earlier studies provide an overview of the CSFs in road construction projects, they mostly concentrate on case studies and focused on the PPPs model. As a result, their conclusions might not apply to all road construction projects in emerging economies. According to Beleiu, Crisan and Nistor (2015), the above studies on PPP road projects are unique to that project type. Ondari and Gekara (2013) then evaluated the elements that contribute to Kenya's effective completion of public road projects. The study used a quantitative research methodology based on questionnaire-based surveys. It used convenience sampling, correlation, and percentage analysis to examine the data gathered. According to the study, (i) management support, (ii) design requirements, (iii) contractor capability, and (iv) influencers' supervisory capacity are the primary aspects that are crucial to the completion of public road projects. According to Mwelu, et al. (2019), (i) regulatory frameworks, (ii) perceptions of their inefficiencies and adherence to them, (iii) monitoring activities, and (iv) professionalism of the staff aid the successful implementation of public road construction projects in Uganda. CSFs, on the other hand, are particular to a nation, industry, or area (Yong and Mustaffa, 2012; Tripathi and Jha 2018).

In Ghana, Famiyeh, et al. (2017) undertook a study to pinpoint the main causes of time and cost overruns in projects related to the education sector in Ghana. On roughly 60 government school projects, the study surveyed consultants for clients and representatives of the contractors. The relative effects of the factors causing construction time and cost overruns were assessed using the relative importance index. The main causes of construction time overrun were: (i) financial issues, (ii) irrational contract durations imposed by clients, (iii) a lack of a clearly defined project scope, (iv) client-initiated changes, (v) under-estimation of project costs by consultants, and (vi) inadequate project inspection/supervision by consultants. Other contributing problems included (i) contractors' under-estimation of the project's complexity, (ii) poor site management, (iii) contractors' use of improper construction techniques, (iv) delays in the delivery of licenses by governmental bodies, (v) the client's financial difficulties, (vi) the delays in receiving payment for finished work, (vii) design changes, (viii) a lack of communication strategies, (ix) inadequate feasibility and project analysis, (x) poor financial management on site, and (xi) changes in material prices. Kissi, et al. (2019) used structured questionnaires to gather the opinions of project specialists on the impact of project monitoring and evaluation (M&E) methods on project success criteria in the Ghanaian construction industry. This research used partial least squares structural equation modelling to establish the hypothesis-based impact of project M&E practices on project success. The results showed a connection between M&E procedures and the standards for successful construction projects. Damoah, et al. (2019) investigated the causes of project abandonment in the Ghanaian public education sector. The research included a survey of clients, project managers, and contractors in charge of completing Community Day Senior High School Building projects. The CSFs were divided into five categories using factor analysis and structural equation modelling. They were Political leadership, culture, external influences, resources/funding, and administrative/institutional. All these combinations of factors were statistically significant in the abandonment of infrastructure projects for the public education sector in Ghana. However, the most important groups of elements were political leadership, followed by weak institutional/administrative practices, inadequate funds and resources, cultural issues, and outside forces. Amoah, Berbegal Mirabent and Marimon Viadiu (2021) investigated the combined impact of six (6) criteria that are frequently identified as predictors of successful project management in construction projects in the project management literature. An ad-hoc survey was used to compile the replies from 120 Ghanaian project management professionals to experimentally accomplish this goal. The researchers first created and validated the scale that assessed project management methods in DEs based on previous work. Subsequently, the combination(s) of the aforementioned six (6) elements

of successful project management in construction projects were examined using qualitative comparative analysis. The results of the study demonstrated that the success of construction projects is directly influenced by a variety of human-related factors, project-related factors, project procedures, project management factors, project support factors, and external environmental factors. These studies did not specifically focus on road projects. Amoatey and Ankrah (2017) examined the CSFs of public road construction projects using the relative relevance index approach. The analysis found that (i) the owner's tardy payment for finished work, (ii) the contractor's lack of expertise, (iii) the owner's alterations to the project's scope during construction, (iv) the delay in delivering the site to the contractor, and (v) the project's rigid financial allocation were the top factors. Also, Dagba and Dagba (2019) evaluated the effect of contract management procedures and procurement techniques on the performance of road construction projects in Ghana. Purposive sampling and mixed method techniques were employed in this paper. Participants in this study were government officials and contractors. According to the research, competitive and limited tendering yield the best value for money because they had the lowest coefficient of variance when compared to the other factors involved in road construction. Furthermore, Damaoh, et al. (2022) used extensive semi-structured interviews (16) and surveys (372) in Ghana to examine the CSFs of public-sector road construction project execution from the perspective of definitive stakeholders associated with such projects. Thirty-four (34) CSFs were found using the Chi-square statistical significance test, the relative importance index, Spearman Rank Correlation Coefficients, Kendall's Coefficient of Concordance, and other metrics. The top ten factors, listed in decreasing order of importance, are (i) no political interference; (ii) project continuity by succeeding governments; (iii) adequate project funding; (iv) support from financial institutions and donor agencies and countries; (v) government commitment to the project; (vi) absence of clientelism; (vii) absence of nepotism; (viii) absence of political corruption; (ix) timely payments to contractors; and (x) absence of court injunctions, legal actions, and land disputes. Barajei, et al. (2023) examined the CSFs of the pre-construction phases of the life cycle of the public road building project in Ghana. Through a questionnaire survey, information on 26 CSFs and 16 success criteria was gathered from key public road construction stakeholders throughout Ghana. Following that, structural equation modelling (SEM) was used to assess the data. The study found that procurement-related factors only had an impact on the performance of the contractor selection phase. However, external environmental elements and project management factors had a direct impact on the success of conceptualization and planning, design, and contractor selection phases of the Ghanaian public road construction project life cycle. It is evident from the review of literature that studies that focus on the success factors of the consultant selection phase of public road projects in developing nations are rare. Hence, a need to thoroughly investigate the CSFs of the consultant selection phase of Ghanaian public road construction projects.

Research Methodology

The methodology employed in the questionnaire design, the sample techniques used, the data collection method, and the analytical techniques adopted for the work are all explained in this part. The researchers employed a quantitative survey methodology to define and classify the variables. This allowed for the use of significantly larger samples and aided in the statistical forecasting of the relationship between independent and dependent variables. As a result, a phenomenon can be applied to a broader population (Bryman, 2016; Cresswell and Cresswell, 2017). Also, given that the respondents are dispersed throughout Ghana, questionnaires were chosen over in-person interviews because of their convenience, lower cost, and shorter turnaround time. The questionnaire was thoughtfully created to minimize the number of drawbacks common to questionnaire surveys, such as low response rates and issues with question phrasing and construction (Manfreda, Batagelj and Vehovar, 2002; Reips, 2000). Based on data gathered from the review of literature, the questionnaire was created. The objective of the study was taken into consideration during the design of the questionnaire. The variables in the survey were graded on a seven-point Likert scale (Kim,

2010) with 1 being strongly insignificant, 2 being partially insignificant, 3 being inconsequential, 4 being neutral (uncertain), 5 being partially significant, 6 being significant, and 7 being extremely significant. The first component of the questionnaire aimed to learn more about the demographics of the respondents. The second piece asked about the extent to which 26 CSFs influenced the success (i.e., the consultant selection phase was completed on time; the consultant selection phase was completed within budget; a competent consultant engaged; and the internal stakeholders were satisfied with the consultant selection phase) of the consultant selection phase of the completed projects. This was based on a synthesis of success factors that had been discovered by Barajei, et al. (2023). To assess the questionnaire's contents and ensure the applicability of the topics to be addressed, the researchers interviewed five (5) experienced specialists from academia and the construction sector.

The survey was administered to 186 clients and consultants' representatives who supervised the 290 completed road projects implemented by Ghana's road agencies. The respondents were the project management team members of clients and consultants who collectively managed the public road projects completed within the last five years. The relative significance and ranking of the success factors were determined using the Relative Importance Index (RII) created by Kometa, Olomolaiye, and Harris (1994). This method is widely acknowledged and has been utilized by numerous studies in construction project management including Sambasivan and Soon (2007) and Muhwezi, Acai and Otim (2014). The same approach was used by Enshassi, Al-Najjar and Kumaraswamy (2009) and Amoatey, et al. (2015) to analyse delays and cost overruns in construction projects in the Gaza Strip and Ghanaian state housing projects, respectively. The following formula is used to calculate the RII:

$$RII = \Sigma W / (A^*N)$$

Where:

W – is the weight given to each factor by the respondents and ranges from 1 to 7, where "1" is "strongly insignificant" and "7" is "strongly significant".

A - is the highest weight (i.e., 7 in this case); and

N – is the total number of respondents (i.e., 156).

Results and Analysis

This section addresses the study's respondent demographics and descriptive and inferential analyses.

BACKGROUND OF RESPONDENTS

One hundred and fifty-eight (158) questionnaires, or 85.95% of the total 186 distributed, were collected. Following the data cleaning process, two (2) responses (1.07%) were eliminated, leaving 156 (83.87%) valid responses for data analysis. Background data like education and years of experience in the construction industry, according to Hallowell and Gambatese (2009), are good indicators of professional expertise. Also, they ensure the validity and reliability of study results (Cresswell and Cresswell, 2017; Dainty, 2008). Table 2 displays an overview of the characteristics of the respondents.

Forty-nine (49) respondents (31.4%) were geomatic engineers, 56 respondents (36.9%) were civil engineers, and 51 respondents (33.7%) were quantity surveyors out of the total 156 valid responses obtained. In light of this, it may be said that respondents' assessments of the study's variables fall into a variety of balanced groups. The statistics on the respondents' greatest levels of academic success revealed that they were professionally qualified, with a bachelor's degree serving as the lowest qualification. It also suggests that those surveyed were aware of how to complete the forms. One hundred and thirty-five (135) respondents (86.5%) had master's degrees, compared to 21 respondents (13.5%) who had bachelor's degrees. Only

Table 2. Profile of Respondents

Variable	Frequency	Percent (%)	Mean (SD)
Highest level of academic achievement			N/A
Diploma	0	0	
Bachelors	21	13.5	
Masters	135	86.5	
Total	156	100	
Designation of respondent			N/A
Geomatic Engineer	49	31.4	
Civil Engineer	56	36.9	
Quantity Surveyor	51	33.7	
Total	156	100	
Training in construction or project management?			N/A
Yes	154	98.7	
No	2	1.3	
Total	156	100	
Role in project delivery			N/A
Client	41	26.3	
Consultant	115	73.7	
Total	156	100	
Years of field experience in construction			21.65 (6.977)
0 - 9 years	2	1.7	
10 - 19 years	65	56.6	
20 years and above	48	41.7	
Total	115	100	

two respondents (1.7%) had between six (6) and nine (9) years of professional experience, 65 respondents (56.6%) had between ten and nineteen years, and the remaining 48 respondents (41.7%) had more than twenty years. Thus, the respondents generally have more than adequate experience and qualifications in the study's subject matter.

DESCRIPTIVE ANALYSIS

In terms of respondents' knowledge of variables for a particular set of statistical data, the standard deviation is a measure of consistency and changeability (Motulsky, 2003). As a result, it is significant when considering the reliability and validity of the study findings (Motulsky, 2003). Less than 1.00 in the standard deviation indicates limited changeability and great consistency. Low variability and high consistency in the interpretation of variables by respondents and vice versa are suggested by a small standard deviation (less

than 1.00) linked with the mean scores of the variables/attributes being measured (Field, 2005). Because the standard deviations were less than 1.00 for all the variables examined, it can be concluded that the study participants' replies had low variability and good consistency. The details are shown in Table 3.

Table 3. Mean Scores for Scales

Notation	Scale Item	Minimum	Maximum	Mean	Std. Deviation
SF1	Top management support	3.00	7.00	5.651	.67652
SF2	Team capability	3.00	7.00	5.343	.50529
SF3	Effective planning	3.00	7.00	5.865	.70016
SF4	Controlled political interference	3.00	7.00	5.998	.49876
SF5	Communication	2.00	7.00	4.005	.52202
SF6	Team members commitment	2.00	7.00	3.948	.44053
SF7	User involvement	2.00	7.00	4.099	.62435
SF8	Stable government	3.00	7.00	5.805	.71608
SF9	Availability of equipment	3.00	7.00	5.285	.64812
SF10	Favourable weather	3.00	7.00	5.607	.76539
SF11	Transfer of experience and best practice	2.00	7.00	3.948	.64142
SF12	Fighting corruption	4.00	7.00	6.674	.59585
SF13	Project management structure	3.00	7.00	5.247	.49572
SF14	Availability of resources/materials	3.00	7.00	5.103	.75843
SF15	Feasibility study	2.00	7.00	3.812	.41691
SF16	Minimize bureaucratic procurement process	2.00	7.00	4.267	.59133
SF17	Adequately defined task	2.00	7.00	3.891	.80005
SF18	Transparent procurement process	4.00	7.00	6.311	.60123
SF19	Works specifications	3.00	7.00	5.364	.70081
SF20	Project requirements	2.00	7.00	4.148	.64029
SF21	Procurement method	3.00	7.00	5.208	.69897
SF22	Cashflow	4.00	7.00	6.523	.64413
SF23	Contractual terms and conditions	2.00	7.00	4.744	.53629
SF24	Adequacy of design	2.00	7.00	4.101	.71115
SF25	Economic (stable economic conditions and economic policy)	2.00	7.00	4.907	.61657
SF26	Effective supervision	4.00	7.00	6.231	.69985

INFERENTIAL ANALYSIS

The success factors were ranked and calculated using the RII approach based on the respondents' indications of their relative importance. In reality, contractors in Qatar have utilized a similar procedure to evaluate the key construction risk variables (Jarkas and Haupt, 2015). The result of the RII is shown in Table 4.

Table 4. The Relative Importance Index and Ranking of Construct Variables

Construct	Variables	RII	Rank
Project Management Factors (PMF)	Cash flow	0.904	1
	Effective supervision	0.873	2
	Effective planning	0.848	3
	Top management support	0.817	4
	Team capability	0.762	5
	Project management structure	0.668	6
	Adequacy of design	0.578	7
	Communication	0.579	8
	Transfer of experience and best practice	0.568	9
	Team members' commitment	0.568	10
	Adequately defined task	0.559	11
	Feasibility study	0.552	12
External Environmental Factors (EF)	Fighting corruption	0.924	1
	Controlled Political interference	0.888	2
	Stable government	0.875	3
	Favourable weather	0.805	4
	Availability of equipment	0.753	5
	Availability of materials	0.697	6
	Economic (stable economic conditions and economic policy)	0.653	7
	User involvement	0.585	8
Procurement-related Factors (PRF)	Transparent procurement process	0.898	1
	Procurement method	0.839	2
	Works specifications	0.776	3
	Contractual terms and conditions	0.652	4
	Minimize bureaucratic procurement process	0.613	5
	Project requirements	0.583	6

The classification of the success factors into three groups was based on Barajei (2023). According to Muhwezi, Acai and Otim (2014) and Famiyeh, et al. (2017), any factor that reported a RII of less than 0.599 was regarded as inconsequential. Hence, such factors were dropped from the study outcome.

Discussions of Results

The success elements for the public road project consultant selection phase found by this study are discussed in this section.

EXTERNAL ENVIRONMENTAL FACTORS (EEFs)

The study result indicates that EEFs influence the success of the public road construction project consultant selection phase. EEFs made up of fighting corruption, favourable weather, controlled political interference, economic (stable economic conditions and economic policy), stable government, availability of materials, and availability of equipment based. Although they serve the same purpose, success and failure factors are opposite to one another (Gunasekera, 2009; Cooper, 2019). This suggests that project success occurs when failure factors are addressed. Owusu, Chan and Ameyaw (2019) and Adindu, et al. (2020) professed that the contract phase of construction projects is vulnerable to corruption and political interference. Politicians and technocrats alike do whatever it takes to get the consultancy job awarded to their cronies. This is to inflate the design cost and to ensure collusion among consultants, technocrats, contractors, and politicians during the design and construction phases (Luna, 2015). Additionally, it has been documented that a lack of equipment affects the success of projects during the construction phase in Ghana (Damoah, et al., 2019; Damoah and Kumi, 2018). However, the road agencies in Ghana are one of the most equipped in terms of logistics (vehicles, computers, and printers) to carry out their duties due to the relatively huge financial support to the sector by donors and the Government of Ghana (GoG). Furthermore, the consultant selection phase is also hardly affected by a change of government which adversely affects the construction phase of projects in developing nations. Usually, the new administration gives up unfinished projects from the previous administration and shows more interest in advancing its programmes and initiatives to win the next election (Akwei, Damoah and Amankwah-Amoah, 2020; Damoah, et al., 2019; Damoah and Kumi, 2018). Unlike the construction phase, the consultant selection phase is usually short duration. Also, it has an insignificant cost and is not bedevilled with any cash flow issues. Thus, it is mostly completed within regimes. Due to tiredness, hot weather reduces worker productivity, whereas rain and scarcity of materials affect the timely completion of the construction phase of projects (Fameyeh, et al., 2017; Asiedu and Adaku, 2019). However, the consultant selection phase is immune to these conditions as it is largely office-based. Also, materials such as stationery are readily available at this stage. These factors contribute to the effect of EEFs on the success of the Ghanaian public road construction project consultant selection phase. This new finding adds to the body of knowledge on public road construction project management in Ghana.

PROJECT MANAGEMENT FACTORS (PMFs)

Also, the study result shows that PMFs affect the success of the consultant selection phase of Ghanaian public road construction projects. PMFs comprise six (6) factors namely top management support, team capability, effective planning, project management structure, cash flow, and effective supervision. These factors depict the importance of personnel capabilities and administrative systems in the execution of the project (Damoah, et al., 2019; Damoah and Kumi, 2018). The competence of a project team is a significant aspect that determines project success, according to Aje (2012) and Larson and Gray (2018). The road agencies have adequate capacity in procurement due to the support from donors and GoG over the years. For instance, the World Bank has been organizing tailor-made procurement training programmes for road agencies in Ghana. Technocrats' impartiality in the execution of public construction projects, however, is under doubt

(Asiedu and Adaku, 2019). Public institution leaders must behave in their appointer's best interests to avoid offending them because appointments in these institutions are extremely political (Asiedu and Adaku, 2019). Consequently, even competent technocrats are unable to adhere to appropriate procurement standards, best practices, and the laid down administrative systems. Also, cash flow, according to Omopariola, et al. (2020), is the primary factor in project success and the lifeblood of construction projects. The road agencies enjoy relatively huge budgetary support from donors and GoG as road infrastructure has a huge impact on trade and provides citizens with better access to social, health, and educational services (Amoatey and Ankrah, 2017). Hence, funding of activities during this phase is not an issue, unlike the construction phase which is severely constrained by cash flow irregularities (Damoah and Kumi, 2018; Damoah, et al., 2019; Asiedu and Adaku, 2019; Barajei, et al., 2023). The cost incurred during the consultant selection phase covers only adverts, production of tender documents, and payment of allowances to staff for the evaluation of proposals. This cost is not much compared to the budgetary support to the agencies and the exceedingly high cost of oversubscribed contracts during the construction phase (Damoah and Kumi, 2018; Damoah, et al., 2019; Asiedu and Adaku, 2019; Barajei, et al., 2023). Hence, these factors collectively contribute to the effect of PMFs on the success of the Ghanaian public road construction project consultant selection phase. Likewise, this finding is also new and extends the literature on public road construction project management in Ghana.

PROCUREMENT-RELATED FACTORS (PRFs)

The factors that impact the success of the Ghanaian public road construction project consultant selection phase are minimized bureaucratic procurement process, transparent procurement process, procurement method, contractual terms and conditions, and works specifications. If effectively use, the procurement method tackles the problem of consultant capacities (Barajei, et al., 2023). Based on the difficulty of the task, Ghana's Public Procurement Act (PPA) establishes thresholds for shopping, national, and international bids. This is to make sure that qualified consultants are hired based on the prerequisites for each threshold. When properly drafted and carefully followed throughout evaluation, a works specification, or terms of reference guarantees that the best consultants are hired for the design of a road construction project. Additionally, well-written contractual terms and conditions, transparent procurement procedures, and minimized bureaucracy lessen disagreements, increase confidence, spur competition (Barajei, et al., 2023), and make it easier to complete any procurement process on schedule and budget. According to Ofori-Mensah and Rutherford, referenced in Dauda, Sayibu Suhuyini and Antwi-Boasiako (2020), procurement violations are frequently discovered in audit reports in Ghana. One of the most vulnerable areas for procurement fraud and corruption in developing countries has been identified as the solicitation and evaluation of bids (Owusu, Chan and Ameyaw, 2019; Adindu, et al., 2020; McPheraon and MacSearraigh as referenced in Neupane, et al., 2014). In Ghana, the procurement process is frequently manipulated to support the interests of politicians and procurement officers (Osei-Tutu, Badu and Owusu-Manu, 2010; Ameyaw, et al., 2017; Owusu, Chan and Ameyaw, 2019). Examples of procurement fraud, according to Osei-Tutu, Badu and Owusu-Manu (2010), include procurement entities manipulating procurement rules to favour their favoured tenderer and altering the substance of tender documents to affect contract awards. Additionally, the political interference and corruption at this level exacerbate bureaucracy in public administration processes that cause delays (Damoah and Kumi, 2018; Damoah, et al., 2019; Barajei, et al., 2023). Concerning the transparent procurement process, the Ghanaian procurement regulation does not stipulate that public agencies adhere to e-procurement and the "Standstill" period following the evaluation of tenders, or the public posting of contracts after awards (Barajei, et al., 2023) to ensure transparency and increase public confidence (Evenett and Hoekman, 2005; Prier, McCue and Boykin, 2021). These encourage competition and result in value for money in public procurement. Hence, these factors together explain the impact of PRFs on the success of the Ghanaian public road construction project consultant selection phase. Again, the literature on public road construction project management in Ghana has been expanded by this novel finding.

Study Implications

The following recommendations can be made in line with the study findings:

i. It has become urgent to amend the current procurement statute. Value for money will be improved by requiring mandatory e-procurement, a "standstill" time, and the publication of contract awards for national and international competitive tenders. This amendment will enhance real-time auditing, thereby, deepening transparency, efficiency, and effectiveness in the management of public construction projects. Politicians and their allies will be forced to follow the best procurement practices leading to improved professionalism. Hence, the GoG can do more infrastructure projects to enhance the living standards of its citizenry.
ii. From the industry and practice point of view, the findings provide insights to project managers and their organizations in terms of how to monitor and control the progress of the Ghanaian public road project consultant selection phase based on CSFs. Thus, the findings will for the first time enable sector practitioners to effectively and efficiently commit resources to properly monitor and control consultant selection phase-specific CSFs to ensure project success.

Conclusion

According to Ghanaian public road construction experts, the factors that determine the success of the consultant selection phase of Ghanaian public road construction projects are project management factors, procurement-related factors, and external environmental factors.

a. Project management factors comprise six (6) factors, namely, top management support, team capability, effective planning, project management structure, cash flow, and effective supervision.
b. External environmental factors are made up of seven (7) factors. These are fighting corruption, favourable weather, controlled political interference, economic (stable economic conditions and economic policy), stable government, availability of materials, and availability of equipment.
c. Procurement-related factors consist of five (5) factors, which are minimized bureaucratic procurement process, transparent procurement process, procurement method, contractual terms and conditions, and works specifications.

Finally, the findings of the study extend the literature on Ghanaian public road construction project management as it is the first of its kind.

Limitations and Future Research Direction

The study is limited to the consultant selection phase of Ghanaian public road construction projects. Hence, further research on CSFs influencing the success of consultant selection phase of public road construction projects in other jurisdictions is recommended.

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