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ABOUT JCBM

The **Journal of Construction Business and Management (JCBM)** is an open access journal published bi-annually by the University of Cape Town Libraries, South Africa. The Journal is hosted by the Construction Business and Management Research Group of the University of Cape Town. The journal aims to explore the experience of construction industry stakeholders and trends in the global system. It aims to publish peer reviewed and highly quality papers emanating from original theoretical based research, rigorous review of literature, conceptual papers and development of theories, case studies and practical notes. The journal also welcomes papers with diverse methodological research approaches including qualitative, quantitative and mixed methods. Contributions are expected from academia, public administrators, professionals in the public sector and private practice (such as contracting organizations and consulting firms) and other related bodies and institutions (such as financial, legal and NGOs).

The scope of **Journal of Construction Business and Management (JCBM)** covers, but is not limited to construction management and project delivery, strategic management, decision making, skills development, organizational practices and procedures in construction business. The specific areas in construction management, sustainability in construction and project delivery include project planning/feasibility studies, procurement, resource management, international construction, ethical issues, industrial relations, legislative requirements and regulations, construction education, information and communication technologies, housing policies, and urban design and development. Strategic management in construction covers risk management, quality management, resilience and disaster management, cultural and societal management, project life cycle management, and knowledge creation and management. Among issues in construction organizational practices and procedures covered are business development strategies, human resources and career development, continuous professional development, leadership systems, marketing strategies, gender issues and corporate social responsibility.

Journal of Construction Business and Management (JCBM) is a peer reviewed journal. All research articles in this journal undergo rigorous peer review, based on initial editor and anonymised refereeing by at least two anonymous referees.

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Editorial

On behalf of the editorial team of the Journal of Construction Business and Management, I warmly welcome you to the seventh issue. In line with the objectives of the journal, the issue presents scholarly discussions on theoretical and empirical challenges confronting best practices and policies in infrastructure and engineering projects. The intention is to understand what is obtainable in practice and whether it aligns with theory to work on the gaps. The topics in this issue covered ethics in construction, accounting in construction projects, socio-economic impacts of civil works, entrepreneurship in construction, finance of infrastructure projects and a framework on construction subcontracting policy. The issue contains six articles that were written by sixteen scholars based in Botswana, Nigeria, Zambia and Zimbabwe.

The first paper by Akintola, Jagboro, Ojo and Odediran assesses effective mechanism for the enforcement of ethical standards to improve public confidence in construction professionals. The study reveals that personal reputation, promotion of civic right, and good citizenry were moderately significant as ethical standards. The study concludes that four major mechanisms that are effective in the enforcement of ethical standards in the construction industry in Nigeria are roles to be played by the stakeholders, individual, industry and legal instruments. The second paper by Rwelamila and Mogome investigates challenges of formally closing the final account of construction projects in Botswana local authorities. The results show that the process of final account closure was inefficient and marginally effective. The rationale for such inefficiency and ineffectiveness are contractors abandoning projects when they realize that the cost of rectifying the defects far exceeds the outstanding balance. Also, clients taking too long to agree and approve final accounts and loss of information when key personnel leave the project on the contractor's side before the final account is finalized. The study concludes that all adopted contract conditions be modified to address the challenges.

Alade's paper assesses the environmental and socio-economic effects of the upgrade of Ojodu Berger road in Lagos, Nigeria and the mitigating measures of the adverse effects. The article reveals that poor environmental conditions happen at the pre-construction stage, which becomes escalated at the construction phase while noise pollution is the most significant environmental problem. At the construction phase, encroachment on pedestrian facilities has the most significant impact. Socio-economic impacts such as increased rental value, unemployment and displacement of businesses are also significant. Mitigating measures against adverse socio-economic impacts were neither effective nor ineffective, while some adverse effects were not mitigated. There is no evidence that an environmental impact assessment was carried out before the implementation of the project.

The fourth paper by Adu, Lamptey-Puddicombe and Opawole examines survival strategies for building construction management entrepreneurs and factors affecting the adoption of the survival strategies at the infancy stage. Results reveal that all the strategies considered are significant and the dominant ones are innovativeness, required skills, willingness to take risks, entrepreneurial attitudes and behaviours, entrepreneurial organization structure and strategies, and financial resource management. Dominant factors affecting the adoption of survival strategies of construction entrepreneurs are availability and access to finance, the poor state of infrastructure, poor managerial/executive capacity in implementing strategies, characteristics of entrepreneurs and failure to adapt to the changing business environment. Adu et al. conclude that regular training is essential for entrepreneurs to acquire the required skills for effective management of their enterprises.

The fifth paper by Tshehla and Mukudu investigates the critical success factors for assessing project finance for infrastructure development in Zimbabwe. The study grouped the identified factors into governmental, financing, project, special purpose vehicle, and politics and economies, which are extremely important as critical success factors for accessing finance and project financing. The paper concludes that there are critical factors for assessing project finance in Zimbabwe. The last article by Mambwe, Mwanaumo, Phiri and Chabota analyzes policies on the subcontracting practices of local contractors intending to develop a framework that can be used to build capacity within the construction sector in Zambia. The study establishes that critical deficiencies in implementing subcontracting policies are that subcontractors do not participate early in the procurement process and are introduced after the contract is awarded. It also emerged that no clear guidelines on the implementation of the policy are available. It is challenging to grow the capacity of local contractors using the existing subcontracting policy because main contractors are not interested in building the capabilities of local contractors due to lack of incentives.

Finally, I acknowledge all authors who submitted papers for consideration. I also value the contributions and unrelenting efforts of the JCBM editorial board members and panel of reviewers in ensuring that manuscripts are of high quality and keeping the journal on the path to attaining the expected standard and quality. We always welcome criticisms, feedbacks and suggestions from readers on how to improve the quality of the journal.

Abimbola Windapo *PhD*
Editor-in-chief

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Effectiveness of Mechanisms for Enforcement of Ethical Standards in the Construction Industry

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Abstract

Gross unethical conducts are common issues among professionals in the construction sector due to the heterogeneous nature of the industry. However, limited efforts are made to ensure that ethical standards become enforced among professionals in the sector. Therefore, this study assessed effective mechanisms for the enforcement of ethical standards to improve public confidence in construction professionals. Data were collected through copies of questionnaire administered on professionals in consultancy, contracting and government organizations in Southwestern Nigeria. One hundred and seventy-two (172) copies of questionnaire were retrieved and found suitable for the analysis. Data collected was analyzed using both the descriptive and inferential statistics. The study revealed that all the ethical standards identified were moderately significant with relative effective index (REI) that ranged from 0.585 to 0.526. Some of these included personal reputation, promotion of civic right, good citizenry, among others. Four major effective mechanisms for the enforcement of ethical standards extracted through factor analysis are the roles to be played by the stakeholders (68.22%), individual (9.44%), industry (3.64%) and legal instruments (3.08%). It was concluded that these four mechanisms are effective in the enforcement of ethical standards in the construction industry. The study recommends that all construction stakeholders must ensure that all hands are on deck through collaborations to sanitise the image of the industry. The outcome of this research will improve the ethical orientation of each professional, which will have a positive effect on the general public's perception of the industry.

Keywords: Construction Industry, Construction Professional, Effective, Enforcement, Ethical Standards

1. Introduction

Ethics cover all sectors of the economy, construction industry inclusive. Ethics could be referred to as a set of principles which include social, religious or civil code of behaviour that is considered to be correct. Robinson, Dixon, Preece and Moodley (2007) defined ethics as the philosophical study of what is right or wrong in human conducts and what rules or principles should govern it. However, Loulakis (2003) perceived ethics to be the agreed set of principles for a particular profession linked to moral values held by a group or society at large. Naturally, truths should govern human nature from which one should be able to differentiate between what is right and wrong (Freeman, 2008). The naturally imbibed truths teach moral values and reject immoral values as unethical; the truths also referred to as professional ethics guiding professionals when discharging their duties. Professional ethics is the behaviour expected of an individual or a particular group in the industry that is bound by a set of principles, attitudes or types of character dispositions. These set of principles and attitudes control the way a profession is practiced (Vee & Skitmore, 2003). Ethics, therefore, point to the standards or codes of behaviour expected by the group to which an individual belongs. This could be national ethics, social ethics, company ethics, even family or professional ethics (Kayne, 2010). Professional ethics are the moral values held by a group of people. This is peculiar to professions, in which the fundamental principles incorporated in their professional bodies include integrity, objectivity, competence and care, confidentiality and behaviour (Olatunji, Oke, Aghimien & Ogunwoye, 2016). According to Lam, Hu, Ng, Skitmore and Cheung (2001), the public expects the best from the professionals and the ethical conduct

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displayed by these professionals dictates how the society at large perceive such profession.

Various researchers have documented the ethical states of the construction industry. Oyewobi, Ganiyu, Oke, Ola-Awo and Shittu (2011) established that the industry has historically been challenged with severe pitfall in ethical conducts of construction professionals. Hence, the industry is susceptible to ethical erosion, probably due to its heterogeneous nature. Construction professionals are therefore not in the good books of private, corporate or public clients and this has attracted topical discourse than any other sector (Hong Kong Ethics Department Centre (HKEDC), 1996; Construction Industry Review Committee (CIRC), 2001; Hong Kong Housing Authority (HKHA), 2000; Ho and Ng, 2003). There have been several allegations concerning professional members of the construction industry involving both financial and professional misconducts which created concerns to the public. This led to a lack of trust and confidence of the public that require services of construction professionals and also at the receiving end (McCarty, 2012). The need for a mechanism to checkmate unethical practices is therefore necessary. Uff (2003) established that a mechanism to redeem the poor image of the industry is needed. Mason (2009) concluded that a single code could be fruitful when observed as part of broader measures for training and promoting ethical conduct in the construction industry. McCarty (2012) study was on developing an Australian code of construction ethics. The findings of the study revealed weaknesses which showed codes as remedial that might not provide any framework for decisions in the industry.

Despite measures put in place to safeguard the image of the industry, literature still revealed that the poor image of the industry, is due to the challenge in the enforcement of ethical standards. Based on the available findings from the literature, for the industry to remain in existence, a radical redemption of its image is then inevitable. The Nigerian construction industry, therefore, cannot afford to ignore the importance of professional ethics among the practitioners, which in recent years, has been documented to be under severe criticism (Alo, 2009). Despite seminars, workshops, sensitization and professional development programmes being organised by relevant professional bodies, the literature reveals that the poor image of the industry is due to the challenge in the enforcement of ethical standards which has attracted little attention in the literature. Hence, this study, therefore, examines the effectiveness of mechanisms for enforcement of ethical standards to mitigate ethical lapses and improve the image of construction professionals and the industry at large.

2. Review of Literature

2.1 Ethical Conducts and Construction Professionals

Ethical conducts among construction professionals had been of concern generally. Badger (1996) assessed the significance of ethical conduct among people working in the industry. It was concluded that professionals should interpret personal ethics as treating others with the same degree of honesty they would like to be treated. As important as professional ethics is in the construction industry, non-adherence to ethical standards can cause a major injury or at times lead to loss of life and even property. This implies that any unethical conduct which the professional is involved in has a direct and adverse effect on human lives (Davis, 2001). Personal ethics is therefore essential, which is believed to be a reflection of one's background, personality and values. Professionals' perspective to ethical conduct can be strongly influenced by the morals and values upheld by an organization in which a professional belongs. Irrespective of one's sense of doing what is right or wrong, professionals might be engulfed by the non-observance of professional ethics based on the employing organization. It was, therefore concluded that ethical problems could be directly traced to the organizational culture and leadership in the construction industry (Brien, 1998).

Unethical behaviour is an impediment to economic development and sustainable growth in any given society, especially in developing nations under which Nigeria is categorized (Ikuabe, 2015). Studies on unethical practices in the construction industry abound, and these include BMPIU (2005); Olatunji (2008); Ayangade, Wahab and Alake (2009) and Ameh and Ogundare (2013). The nature and peculiarities of construction activities at times give room for ethical dilemmas both at pre and post contract stages. Such activities include contract documentation, obtaining tenders, contract awards, contract administration, procurements of materials, valuation, and stage payments (Oyewobi et al., 2011). Whenever professionals are involved in any of these unethical practices, the reputation of the industry is questioned. Related studies identified bid-cutting, bid-shopping, hidden fees and commissions; and compensations as everyday acts that impinge on professional integrity and make clients lose their confidence in construction professionals (Zarkada-Fraser & Skitmore 2000; May, Wilson & Skitmore, 2001). Vee and Siktmore (2003) researched the use of ethical codes in the Australian construction industry. Findings revealed that the subject matter of ethics never cropped up in business meetings despite the use of ethical codes. Ethical issues were examined among construction managers, contractors and sub-contractors in the American construction industry. It was noted that 'reverse auctions' in the procurement process was perceived to be ethical by the American clients; however, this is considered to be unethical by the contractors (Doran, 2004).

Other related studies included identification of problems facing professional environment, which include quality control and how ethical matters are addressed in the organisations (Pearl, Bowen, Makanjee, Akintoye & Evans, 2005). A comparative investigation of the relationship between professional ethics and construction quality in Australia and South Africa indicated that corruption, negligence, bribery, conflicts of interest, underbidding, cover pricing, and bid withdrawal affects the quality of construction services (Abdul-Rahman, Wang & Yap, 2010). An appraisal of the ethical issues in the Kenyan construction industry with a particular focus on professional conduct in engineering technology management was investigated by Githui (2011). Findings from the study showed that achieving professionalism in

the industry depends squarely on the moral and ethical nature of the industry's participants. It was thereby recommended that the main focus should be on espousing moral conduct in service delivery. Having examined studies on ethical issues in the construction industry globally, research findings established that what is obtainable in the Nigerian construction industry is similar to other countries. However, cases of misconducts among construction professionals are rampant in Nigeria (Oke, Aghimien & Aigbavboa, 2017). It can, therefore, be concluded that studies on professional ethics in the construction industry abound, although few were recorded on effective mechanisms for the enforcement of ethical standards in Nigeria. This constitutes the focus of this study.

The state of corruption in the industry has warranted concerns from various stakeholders (Ameh & Odusami, 2010a). Professional ethics in the Nigerian construction industry concerning clients' confidence and satisfaction were assessed (Olatunji, 2006). The study established a timely intervention for professionalism in order to avoid the collapse of the industry. Oyewobi et al. (2011) examined the determinants of unethical performance in the Nigerian construction industry. It was concluded that the industry is more susceptible to unethical problems because of the effect of corruption at the planning, tender and completion stages. Also, the study on Nigerian building professionals' ethical ideology and ethical judgement revealed that the current socio-political and economic situation in Nigeria affects the attitude and ethical practices of construction professionals (Ameh & Odusami, 2010b). Ayodele, Ogunbode, Ariyo & Alabi (2011) identified unethical practices in the Nigerian construction industry to include politics in the award of contract, societal corruption and quackery which is the involvement of non-professionals in the industry. The influence of unethical practices on management of construction projects in Nigeria was highlighted due to include the absence of punishment for corruption; loss of money due to change in government; lack of continuity in government programmes and availability of loopholes in project monitoring (Usman, Inuwa & Iro, 2012). Also, Adeyinka, Jagboro &Ojo (2016) investigated the level of usage of mechanism for enforcement of ethical standards. Findings concluded that specifically related mechanism was the most frequently used for enforcement of ethical standards. Construction professionals' compliance level with ethical standards was also examined, and results showed that construction professionals have fair compliance with ethical standards (Adeyinka, Jagboro, Ojo & Odediran, 2014).

According to the reviewed related literature on professional ethics, it is quite clear that research on effective mechanisms for enforcement of ethical standards among construction professionals are limited. This is the main focus of the study. Identification of effective mechanisms will go a long way in assisting stakeholders in the construction industry, including the clients and the general public to tackle the menace of unethical conducts in the industry.

3. Research Methodology

The study was conducted in Lagos Metropolis on the premise that Lagos state is one of the states in Nigeria with the highest number of registered construction professionals in contracting and consultancy organisations. Also, 75% of construction firms in Nigeria are either based in Lagos State or have their branches located there (Fagbemi, 2008). The respondents included architects, builders, quantity surveyors, engineers (civil/structural, electrical, & mechanical) estate surveyors, land surveyors and town planners. Data were collected through a questionnaire survey administered on professionals in the industry. Total of two hundred (200) copies of the questionnaire was administered randomly while 172 retrieved copies of questionnaires were found suitable for analysis. Section A of the questionnaire identified the background information of the respondents, while section B contained questions related to mechanisms for enforcement of ethical standards as identified from the literature. Professionals ranked the level of effectiveness of the identified mechanisms on a scale of 1-5, where 5=most effective, 4=more effective, 3=effective, 2=less effective and 1=Not effective. Data collected were subjected to analysis using a relative effective index (REI) and Factor analysis. The use of relative effective index (REI) or index of relative importance/significance (RII) has been widely used in construction management researches (Adebowale & Ojo, 2009; Ojo, 2010; Adeyinka, 2012, Opawole, 2015). REI was adapted from common relative index measurement, which is also described as relative importance index (RII) or relative significance index (RSI). In this study, it measures the relative index of effectiveness of mechanism for enforcement of ethical standards.

$$RSI = \frac{\sum_0^4 n_i - k_i}{n \times R_h} \quad (1)$$

Where ni= number of respondent choosing
ki = 1-5 on the Likert scale
n = the total number of the questionnaire and;
Rh = the highest value in the ranking order.

Having determined REI of the mechanisms for enforcement of ethical standards, inferential statistics (factor analysis) was conducted to explore the attributes of the variables further and classified them. The extraction method of factor analysis was done through principal components analysis (PCA). PCA transforms original variables into a smaller set of the linear combination that represents the original set (Fellow and Liu, 2003). Kaiser-Meyer-Olkin Measure (KMO) and Barlett test of sphericity tests were also carried out to test the suitability of factor analysis data used.

4. Result and Discussion

The background information of the respondents sampled in the study and as presented in Table 1 indicate that 38.37% of the respondents are in the government organisations, 33.13% are in the contracting organisations while 28.48% are in consulting organisations. All the organizations were well represented in this survey from which information was gathered. The average year of the establishment of respondents' firms was approximately 18 years. Construction professionals surveyed included architects (20.30%), builders (16.28%), quantity

surveyors (18.02%), engineers (19.18%), estate surveyors and valuers (9.30%), land surveyors (8.72%) and town planners (8.14%). The result showed that different professionals and their diverse opinions on the research objectives would enrich the outcome of this study. Also, the result revealed that 86.04% had academic qualifications ranging from HND, PGD, B.Sc. and M.Sc. Also, 86.63% of respondents surveyed are members of their respective professional association, and this indicates that respondents are professionally qualified and the average working experience of the respondents was 19 years. Having examined their particulars, it was clear that the information supplied by the respondents can be relied upon.

Table 1 Background information of respondents

Profile	Parameters	Frequency	Percentage
Type of Organization	Consulting	49	28.49
	Contracting	57	33.14
	Government or public	66	38.37
Years of Establishment of the Firms (Mean=17.64 years)	0-10 years	65	37.80
	11-20 years	46	26.74
	21-30 years	32	18.60
	31-40 years	14	8.14
	40 -49 years	12	6.98
	Above 50	3	1.74
Years of Work Experience of the Respondents (Mean=18.61 years)	0-10 years	54	31.40
	11-20 years	49	28.49
	21-30 years	35	20.35
	31-40 years	24	13.95
	>40 years and above	10	5.81
Profession of the Respondents	Architects	35	20.35
	Builders	28	16.28
	Quantity Surveyors	31	18.02
	Engineers	33	19.19
	Estate Surveyor	16	9.30
	Land Surveyor	15	8.72
	Town Planners	14	8.14
Academic Qualification of the Respondents	OND	18	10.47
	HND	37	21.51
	B.Sc./B.Tech.	72	41.86
	PGD	24	13.95
	M.Sc.	15	8.72
	PhD	6	3.49
Professional Qualifications of the Respondents	Nigerian Institute of Architects	31	18.02
	Nigerian Institute of Builders	26	15.12
	Nigerian Institute of Quantity Surveyors	28	16.28
	Nigerian Society of Engineers	25	14.53
	Nigerian Institute of Estate Surveyors and Valuers	14	8.14
	Nigerian Institution of Surveyors	13	7.56
	Nigerian Institute of Town Planners	12	6.98
	Non-Professionally Qualified	23	13.37
	Total	**172**	**100.00**

4.1 Effectiveness of Enforcement Mechanism

The study examined the effectiveness of mechanisms for enforcement of ethical standards in the Nigerian construction industry. The respondents ranked 50 mechanisms identified from the literature, and the result is as presented in Table 2. From the Table, relative effective index (REI) values ranged between 0.525 and 0.585. The result shows that all the mechanisms were ranked above average (0.5), signifying a moderate level of effectiveness of mechanisms used for enforcement of ethical standards. Some of these mechanisms for enforcement of ethical standards include commitments to personal reputation (REI=0.585). This is followed by promotion of civic right (REI=0.582), good citizenry (REI = 0.581), constant checks and control (REI=0.580), disciplinary measures for misconducts (REI=0.580), good building process planning (REI=0.578), sense of social responsibility (REI=0.578), individual willingness to comply (0.580), and personal ethical influence in the organisation (REI=0.577). Others are regular review of professional ethics (REI=0.569), implementation of national building codes (REI=0.568), good safety measures (REI=0.580), implementation processes by concerned authority (REI=0.563), standardized & universal procedures for individuals and accreditation (REI=0.561), continuing training for members in the industry (REI=0.543), internal and external project monitoring (REI=0.543), conviction of offenders (REI=0.542), strict compliance with due process in tendering (REI=0.542), protecting the industry image (REI=0.541) and roles of media houses (REI=0.539).

Table 2: Relative effective index of mechanisms for the enforcement of ethical standards

	Effective Mechanism	**REI**
1	Personal reputation	0.585
2	Promotion of civic right	0.582
3	Good citizenry	0.581
4	Constant checks and control	0.580
5	Disciplinary measures for misconduct	0.580
6	Good building process planning	0.578
7	Sense of social responsibility	0.578
8	Licensing regulation	0.577
9	Personal ethical influence in the organisation	0.577
10	Instilling self-regulation consciousness into members	0.576
11	Conformity with codes of ethics	0.576
12	Regulation of membership	0.576
13	Ensuring compliance with industry best practices	0.575
14	Keeping members informed of the latest operational procedures in the industry	0.573
15	Individual willingness to comply	0.570
16	Periodic review of processes of membership	0.570
17	Regular review of professional ethics	0.569
18	Implementation of national building codes	0.568
19	Good safety measures	0.567
20	Implementation processes by the concerned authority	0.563
21	Standardized & universal procedures for individual & accreditation	0.561
22	Investigation of petition	0.560
23	Implementation of continuous professional development	0.557
24	Constant reviewing of professional conducts & standards	0.556
25	Improving efficiency & accountability	0.555
26	Commitment to local community protection and engagement	0.554
27	Withdrawing license of erring members	0.552
28	Monitoring local industries producing building materials	0.550
29	Protecting clients interest in the subject matter	0.548
30	Ensuring employees follow compliance rule & regulation	0.546
31	Campaigning strict adherence to benchmark standards	0.545
32	Sanctions on professional involved in misconducts	0.545
33	Continuing training for members in the industry	0.543
34	Internal & external project monitoring	0.543
35	Conviction of offenders	0.542
36	Strict compliance with "Due process" in tendering activities	0.542
37	Protecting the industry image	0.541
38	Automatic alert of changes in laws and regulations	0.540
39	Judicial courts	0.540
40	Roles of media houses	0.539
41	Viewing contract history for future reference	0.538
42	Performing compliance risk assessment	0.536
43	Virtual evidence room to link activities & documents to related law	0.533
44	Performing audits in case of disputes	0.533
45	Transparency initiatives	0.533
46	Anti-fraud & Anticorruption crusade	0.530
47	Managing all aspects of the contract via the internet	0.530
48	Prosecution of offenders	0.530
49	Automatic redlining to easily highlight changes during negotiation	0.526
50	Emporium templates for a standard agreement	0.525

Where: Rk: Ranking and REI: Relative Significant

These mechanisms showcase the efforts of individual professionals in the enforcement of ethical standards in the construction industry. Nearly all the identified mechanism listed are achievable through the help of an individual professional which depicts that individual professional must have a sense of social responsibility to their clients. Social responsibility relevant to the construction industry includes a moral obligation to be a good citizen; sustainability; reputation; relationship with employees and unions; and relationship with suppliers and community representatives. The effectiveness of these mechanisms is, therefore subjected to the individual willingness to comply. Also, the roles of government agencies in the enforcement of ethical standards in the industry were identified. This means that if any of the mechanisms will be effective, government as enforcement agency should be firm and strict. It should also be noted that the roles of the industry in managing their activities

are equally important. The least factors are managing all aspects of the contract via the internet, prosecution of offenders, automatic redlining to easily highlight changes during negotiations and enporion templates for standard agreement. The result shows the role of the industry with the technological challenges in the global world, where major contracts deals are carried out via the internet

4.2 Principal Component Analysis (PCA)

Factor analysis through Principal Components Analysis (PCA) test was carried out, and the results are shown in Table 3. Table 3 presented the result of the measure of sampling adequacy test, which was higher than 0.5 and KMO value of 0.970. Bartlett's test of sphericity was highly significant ($X2$=1.956E4, P<0.05). This result implied that factor analysis carried out was suitable for data collected for this study. This conforms with Field (2005) submission that for factor analysis to proceed; the value of a set of scores should be closer to 1. Also, considering the communalities of the variables, Field (2013) defined communality as a measure of the proportion of variance explained by the extracted factors. Having 30 variables or more gives communalities greater than 0.7 for all variables; however, less than 20 variables can have communalities less than 0.4 (Guadagnoli & Velicer, 1988). Communalities after extraction are expected to be high to have a reasonable representation (Agbabiaka, 2016). From the result in Table 4, communalities are higher than 0.70 for all variables. The average communality after extraction is 0.844 (84.4%), which further confirms the suitability and appropriateness of PCA. Table 5 presented the rotated component matrix, and total variance explained for factor groupings, respectively. Four components were identified with the first dominant factor accounting for 68.22% of the observed variance. The cumulative percentage of variance explained by the four mechanisms for enforcement was 84.39%. This means that 84.39% of the common variance shared by 50 variables can be accounted for by four components. These components were grouped, labelled and presented in Table 5.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.970
Bartlett's Test of Sphericity	Approx. Chi-Square	1.956E4
	Df	1225
	Sig.	.000

4.3. Interpretation of Results

Table 5 also shows the component factors (mechanisms) for enforcement of ethical standards and the loading items. Communalities of the variables loaded under each component factor ranged from 0.773 to 0.911, which gives information about how much of the variance in each item is explained. The first mechanism was stakeholder-role related and accounted for 68.221% of the observed variance and followed by individual- related that accounted for 9.647%, industry-related that accounted for 3.647% and legal instruments-related that accounted for 3.08%.

Stakeholder-role related mechanism accounted for 68.22% of the observed variance with nineteen (19) loading items having high loading scores that ranged from 0.809 to 0.604. Some of the items loaded with their loading scores include ensuring compliance to industry best practices (0.809), campaign for strict adherence to benchmark standards (0.808) regulation of membership (0.804), keeping members informed of the latest procedures in the industry (0.790), withdrawing licence of erring members (0.798), and constant reviewing of professional conducts and standards (0.783). Others are instilling self-regulation consciousness into members (0.779), periodic review of processes of membership (0.771), implementation of continuous professional developments (0.768), standardised & universal procedures for individuals and accreditation (0.761), monitoring local industries producing building materials (0.723), roles of media houses (0.727), protecting the industry image (0.722), internal and external project monitoring (0.720), and monitoring of national building codes (0.708). In addition to these are continuing training for members in the industry (0.708), strict compliance with due process in tendering activities (0.710), implementation of national building codes (0.652) and good building process planning (0.604).

The second component was the individual-related mechanism that accounted for 9.44% of the observed variance with fifteen (15) loading items having high loading scores that ranged from 0.840 to 0.767. Items loaded were in conformity with codes of ethics (0.842), good safety measures (0.840), the good citizenry (0.839), commitments to local community protection engagement (0.832), sense of social responsibility (0.831) and licensing regulation (0.825). In addition to these are personal reputations (0.824), promotion of civic rights (0.822), regular review of professional ethics (0.821), disciplinary measures for misconduct (0.818), protecting clients' interest in the subject matter (0.810), and individual willingness to comply (0.804). Others are a personal ethical influence in the organisation (0.805), implementation processes by concerned authority (0.797) and constant checks and control (0.767). Majority of the items loaded under this factor emanated mainly from personal and individual attributes of the professional.

The third component was an industry-related mechanism which accounted for 3.64% of the observed variance with ten (10) loading items having high loading scores that ranged from 0.746 to 0.689. These include virtual evidence room to link activities and documents to related laws (0.746), ensuring employees follow compliance rule and regulation (0.745), viewing contract history for future reference (0.744), enporion templates for standards agreement (0.732), automatic alert of changes in laws and regulations (0.732). Others were improving efficiency and accountability (0.725), managing all aspects of the contract via the internet (0.724), performing a compliance risk assessment (0.715), performing audits in case of disputes (0.700) and automatic red linning function to easily highlight change during negotiation (0.689). It was noted that all these items indicated the roles of the industry in enforcements of ethical practices.

The fourth component was the legal instruments-related mechanism that accounted for 3.08% of the observed variance with six (6) loading items having high loading scores that ranged from 0.737 to 0.691. These include prosecution of offenders (0.737), anti-fraud and anti-corruption crusade (0.729), investigation of the petition (0.722), the conviction of offenders (0.715), transparency initiatives (0.701) and judicial courts (0.691) — all these items related to a legal instrument of ethical enforcement.

Table 4: Communalities before and after

S/no	Variables	Initial	Extraction
1.	Promotion of civic right	1.000	.825
2.	Sense of social responsibility	1.000	.842
3.	Good citizenry	1.000	.826
4.	Personal reputation	1.000	.773
5.	Good safety measures	1.000	.821
6.	Commitment to local community protection and engagement	1.000	.819
7.	Constant checks and control	1.000	.783
8.	Licensing regulation	1.000	.847
9.	Conformity with codes of ethics	1.000	.866
10.	Disciplinary measures for misconduct	1.000	.823
11.	Regular review of professional ethics	1.000	.851
12.	Protecting clients interest in the subject matter	1.000	.838
13.	Individual willingness to comply	1.000	.828
14.	Implementation processes by the concerned authority	1.000	.815
15.	Personal ethical influence in the organization	1.000	.839
16.	Investigation of petition	1.000	.881
17.	Conviction of offenders	1.000	.874
18.	Prosecution of offenders	1.000	.885
19.	Anti fraud & Anticorruption crusade	1.000	.892
20.	Transparency initiatives	1.000	.854
21.	Judicial courts	1.000	.844
22.	Good building process planning	1.000	.784
23.	Implementation of national building codes	1.000	.825
24.	Monitoring local industries producing building materials	1.000	.853
25.	Continuing training for members in the industry	1.000	.790
26.	Sanctions on professional involved in misconducts	1.000	.818
27.	Strict compliance to "Due process" in tendering activities	1.000	.843
28.	Internal & external project monitoring	1.000	.819
29.	Roles of media houses	1.000	.823
30.	Protecting the industry image	1.000	.833
31.	Instilling self-regulation consciousness into their members	1.000	.853
32.	Regulation of membership	1.000	.866
33.	Ensuring compliance with industry best practices	1.000	.862
34.	Constant reviewing of professional conducts & standard	1.000	.845
35.	Withdrawing license of erring members	1.000	.815
36.	Campaigning strict adherence to benchmark standards	1.000	.885
37.	Implementation of continuous professional development	1.000	.804
38.	Periodic review of processes of membership	1.000	.815
39.	Keeping members informed of the latest operational procedures in the industry	1.000	.847
40.	Standardized & universal procedures for individual & accreditation	1.000	.845
41.	Improving efficiency & accountability	1.000	.858
42.	Ensuring employees follow compliance rule & regulation	1.000	.874
43.	Automatic alert of changes in laws and regulations	1.000	.879
44.	Performing compliance risk assessment	1.000	.877
45.	Virtual evidence room to link activities & documents to related law	1.000	.890
46.	Performing audits in case of disputes	1.000	.893
47.	Viewing contract history for future reference	1.000	.894
48.	Enporion templates for a standard agreement	1.000	.911
49.	Managing all aspects of the contract via the internet	1.000	.846
50.	Automatic red linning function to easily highlight changes during negotiation	1.000	.824

Table 5: Factor loadings and Total Variance explained of Effectiveness of Mechanism for Enforcement of Ethical Standards

Components	Factor Loadings	Total	% of the total variance explained	% of the total cummulative variance explained
Stakeholder-role related		34.111	68.221	68.221
Good building process planning	.604			
Implementation of national building codes	.652			
Monitoring local industries producing building materials	.723			
Continuing training for members in the industry	.708			
Sanctions on professional involved in misconducts	.708			
Strict compliance with "Due process" in tendering activities	.710			
Internal & external project monitoring	.720			
Roles of media houses	.727			
Protecting the industry image	.722			
Instilling self-regulation consciousness into members	.779			
Regulation of membership	.804			
Ensuring compliance with industry best practices	.809			
Constant reviewing of professional conducts & standard	. 783			
Withdrawing license of erring members	.781			
Campaigning strict adherence to benchmark standards	.808			
Implementation of continuous professional development	.768			
Periodic review of processes of membership	.771			
Keeping members informed of the latest operational procedures in the industry	.790			
Standardized universal procedures for individual & accreditation	.761			
Individual-related		4.720	9.647	77.662
Promotion of the civic right	.822			
Sense of social responsibility	.831			
Good citizenry	.839			
Personal reputation	.824			
Good safety measures	.840			
Commitment to local community protection and engagement	.832			
Constant checks and control	.767			
Licensing regulation	.825			
Conformity with codes of ethics	.842			
Disciplinary measures for misconduct	.818			
Regular review of professional ethics	.821			
Protecting clients interest in the subject matter	.810			
Individual willingness to comply	.804			
Implementation processes by the concerned authority	.797			
Personal ethical influence in the organisation	.805			
Industry-related		1.823	3.647	81.309
Improving efficiency & accountability	.725			
Ensuring that employees follow a compliance rule and regulation	.745			
Automatic alert of changes in laws and regulations	.731			
Performing compliance risk assessment	.715			
Virtual evidence room to link activities & documents to related law	.746			
Performing audits in case of disputes	.700			
Viewing contract history for future reference	.744			
Enporion templates for a standard agreement	.732			
Managing all aspects of the contract via the internet	.724			
Automatic red linning function to easily highlight changes during negotiation	.689			
Legal-instruments related		1.544	3.088	84.396
Investigation of petition	.722			
Conviction of offenders	.715			
Prosecution of offenders	.737			
Anti fraud & Anticorruption crusade	.729			
Transparency initiatives	.701			
Judicial courts	.691			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in six iterations.

4.4. Discussion of Findings

The results of REI on the effectiveness of mechanisms for enforcement of ethical standards revealed highly ranked mechanism for enforcement of ethical standards to include commitments to local protection and engagement, personal reputation, good citizenry, individual willingness to comply, good safety measures and promotion of civil rights. Others included withdrawing license from erring members and conviction of offenders. These mechanisms were also highly loaded by principal component analysis (PCA). These mechanisms originated from individuals, which re-emphasises that the effectiveness of any mechanisms can be achieved and be fruitful through the commitments of the individual professional. This calls for the sense of social responsibility from all the stakeholders in the industry. The result affirmed the assertion that professionals must have a sense of social responsibility to their clients and companies should develop corporate social responsibility (CSR) in order to maintain an image of being a good corporate citizen (Petrovic-Lazarevic, 2008). Social responsibilities relevant to the construction industry include moral obligation to be a good citizen, sustainability, reputation, relationship with employees and unions.

The results from factor analysis identified four effective mechanisms for enforcement of ethical standards. The first one was stakeholder-role related-mechanism. Items loaded under this component included instilling self-regulation consciousness into members, ensuring compliance to industry best practices, regulation of membership, implementation of national building codes and implementation of continuous professional developments. Others were good building process planning and monitoring of national building codes. Least items under this factor were continuing training for members in the industry, withdrawing license from erring members. This mechanism and the loading items indicated the combination of governments' legislation and professional bodies' roles in combating corruption in the construction industry. All stakeholders must work together to sanitize and change the public perception about the industry. This can be achieved through the implementation of code of ethics, conduct and practice. Construction stakeholders like government are saddled with the responsibilities of enforcing ethical standards among practitioners through the establishment of code of practice which can be living documents through implementation by the government (Ho and Ng, 2003). The findings corroborated Ladd (1991) that code of conduct includes principles, values, standards, or rule of behaviour guiding decisions, procedures and systems of an organisation in a way that contributes to the welfare of the stakeholders and respects the right of all individuals affected by its operations. Through this, the profession is regulated while the responsibilities of professionals are spelt out clearly. This also affirmed Vee and Skitmore (2003) that a clearer picture of behaviour considered ethical, correct or right are provided through code of conduct. Effective mechanisms for enforcements of ethical standards included implementation of national building codes, good building process planning, monitoring local industries that are producing building materials and strict compliance to “due process” in tendering activities. This is in agreement with Nduese (2010) that curbing the incidence of collapsed buildings must involve the implementation of 2005 National Building Codes. If these codes are implemented, it will take care of building materials and specifications used. Implementation involves following good building planning process as well as compliance with due process in all contract processes, which reduces unethical conducts. Also, the roles of professional associations cannot be underrated. Professional bodies are to make professional developments compulsory for all the members, and this can be achieved through conferences, seminars and workshops. Also, professional bodies should be firm in withdrawing the license of the erring members, which will make other professionals that wish to defaults to decline from unethical practices. Findings agreed with Sohail and Cavil (2008) that professional associations have a critical role in regulating the conduct of her members. Besides, all construction stakeholders should exhibit the hallmark of professional excellence through adherence to ethics, values, competence and integrity (Usman et al., 2012).

The second component was individual-related mechanism and items loaded under this mechanism included commitments to local community protection and engagement, personal reputation, good citizenry, good safety measures and individual willingness to comply. Others are a sense of social responsibility and implementation by the concerned authority. These items were expected to be loaded high because no amount of laid down regulations will yield positive results if concerned personality is unwilling to comply. Items loaded under this mechanism originated from personal and individual factors which affect the moral behaviour of professionals. This conformed with Ukoha (2004) that values influences man's choice and have a significant effect on his behaviour, which is traceable to the background and upbringing of an individual. As strong as ethical codes are, their success lies in the personality's willingness to comply with the principles espoused in the codes. Codes are not strong enough to alter behaviours themselves except personality concerned (Allen & Davis, 1993). Nduka (2004) argued that personality is expressed in the form of values, desires, interests, goals, approvals/disapprovals, preferences and standards. The civic right is promoted when professionals possess good personal reputation. Professionals should note their actions influence the life of others, the environment and the general public. Values, therefore, occupy a central position in all human endeavours and form the basis for social interaction in every society. Human survival depends mostly on their roles in transmitting essential value patterns to the incoming generations (Gibson, 2011). Conclusively, on this component, the issue of personal responsibility cannot be ruled out in enforcing ethical standards. Personal responsibility of professionals should be the foundation as well as the sustenance of ethical standards in the industry.

The third component was an industry-related mechanism with items such as performing audits in case of disputes, automatic alert, ensuring employees comply with the rules and regulations of changes in law and

regulation, virtual evidence room to link activities and documents to related laws. Other mechanisms are an automatic red linning function to easily highlight changes during the negotiation and managing all aspects of the contract via the internet. These mechanisms generated from compliance software programmes used in construction industries for enforcement of ethical practices is technology-based and also expensive. The result indicates the roles of the industry in enforcements of ethical practices. The industry should ensure relevant software in construction-related fields is available to enable the professionals to perform optimally. Also, the industry should create awareness for their employees to operate and exert a strong influence on the ways professionals obliged to conduct their affairs in contemporary society. Findings supported Lawton (2005) that organisations have duties to their employees regarding their concerns for the public interest. The ethical orientations of organisations should be based on the interests and needs of clients. Furthermore, the industry should be current and well equipped always to be relevant with the latest technological advancement in meeting clients' expectations and needs, especially in this fast-growing technological age.

The fourth component for enforcements of ethical standards was legal-instruments' related-mechanism. Items loaded under this include conviction of offenders investigation of petition, anti-fraud and anti-corruption crusade, prosecution of offenders and judicial courts, and transparency initiatives. Employing legal instruments related factor reduces unethical practices because lack of punishment for individuals involved in corruption is one of the factors influencing unethical practices (Usman et al., 2012), and leading to different anomalies in the construction industry (Githui, 2011 & Ayodele et al., 2011). These might question the effectiveness of regulatory agencies in curbing corruption and related financial offences. Functions of these agencies include receiving, investigating petitions, and prosecute the offenders in appropriate cases. Also, they advise the government and educate the public and thereby foster their supports against corruption (Ajibola, 2006). Based on the research findings, legal-instruments related factor was the least component for enforcement of ethical standards. Legal instruments may only be effective in combating unethical practices in the construction industry if they are put in place and justices are administered fearlessly. Appropriate actions should be taken when unethical practices occur irrespective of the personality involved in which the rule of law should not be a respecter of persons. The menace of unethical practices in the industry can be curbed through the effective application of legal instruments that serve as deterrents to others. Also, the sector should be bold to convict offenders, and no individual should be considered to be above the law. A very weak legal framework, tainted judiciary and collapsed system of administration will not make the construction industry win the battle of corruption. Instead, a firm and brunt justice system is required.

5. Conclusion and Recommendations

This paper assessed the effective mechanisms for enforcement of ethical standards in the Nigerian construction industry. It was concluded that the impact of stakeholders, individuals, industry and the rule of law are effective mechanisms for enforcement of ethical standards. The study thereby recommends that government should focus on the implementation of ethical codes in professional practices whereby construction professionals perceive acting ethically as obligations. Construction stakeholders must collaborate to sanitize the image of the industry so that the already established codes will not only be on paper but rather become living documents that will be valued and respected by construction professionals.

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The Challenges of Closing Construction Projects Final Accounts in Botswana Local Authorities

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Abstract

Anecdotal information in the construction industry in Botswana indicated that the process of closing financial accounts for construction projects within a stipulated period is inefficient and ineffective. This is a serious industry problem because a project with an unclosed account is not a successful project as there are unfinished issues and claims left in abeyance to the detriment of both the client and contractor. This motivated a study aimed at investigating this aspect, including identifying the major causes of delays in formally closing final accounts of construction projects in local authorities. A multimethod approach consisting of a review of project documents which were beyond the end of the defect liability period were used in the study. Also, a questionnaire survey was administered to parties dealing with construction projects in the selected local authorities. Lastly, a focus discussion was held with key stakeholders who implement projects in some selected local authorities. Results indicated that while the final account closure process was inefficient (as only 42% of the accounts which were closed were finalised in the stipulated contractual time). Secondly, it was marginally effective (as only 54% of the sampled project accounts were closed). Common reasons for inefficiency and ineffectiveness include (i) contractors abandoning the project when they realise that the cost of rectifying the defects far exceeds the outstanding balance; (ii) clients taking too long to agree and approve final accounts; and (iii) loss of information when key personnel leave the project on the contractor's side before the final account is finalised. Despite the limitation of considering a selected number of local authorities' projects, the findings have confirmed anecdotal information circulating in the industry about the substantial numbers of project accounts that are usually left unclosed. The following recommendations based on the study results are made. That all adopted contract conditions be modified to focus on nipping the challenge in the bud as well as deterring instrument to future defaulters. The suggested modification: 'it shall be mandatory for contractors to bring the project under tender to a formal closure through final account documentation within a specified period, defaulting contractors to be blacklisted from future contract awards in Botswana LAs'. Ordinarily, since contractors can hardly suffer financial losses, the paper suggests that consultants and clients should objectively entertain contractors' claims arising from defects rectifications in the liability period. This is provided such defects were neither caused by poor materials nor are traceable to poor workmanship. These hopefully will mitigate the challenge if followed.

Keywords: Botswana, Construction projects, Final account, Local authorities, Project delays, Project management

1. Introduction

As a construction project comes to an end, a final account statement is prepared to signify three aspects. First, to indicate how the contract sum has been adjusted by additions, deduction, alterations and any other approved payments (Zakaria, Ismail and Yuso, 2012). Second, to indicate an agreement between the two main parties (i.e. client and contractor) to a construction project. Third, to signify an amicable separation of the two key parties. (Chi Ko, 2009). Generally, construction contracts contain a mechanism that allows a contractor, at a specified project milestone, to prepare and submit a final financial statement to a client for review and approval (HIKS,

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2012). In a perfect situation, where there are no disputes, the client is obliged by the contract to issue a final payment certificate and settle the final account. However, during this process, many issues that delay the closure of the final account usually arise. An example is a contractor deciding not to submit a draft final account statement on time or at all or the client not accepting the contractor's statement. An excerpt from the Botswana Department of Engineering and Building Services (DBES, 2017:16) an organ that manages the construction of building for the central government indicates how the closure of final accounts could be a problem:

'During 2010/11 and 2012/13 financial years, contractors listed below undertook the construction of various projects across the country which were implemented through DBES...The projects [listed] were never closed out in accordance with the provisions of the contracts at the end of the defect liability period....if there are any claims to be made you are required to produce all contractual documents relating to your project for consideration and other evidence normally required on a project before any claim, if any, can be considered. Contractors who fail to present themselves... after the said deadline, DBES will thereafter proceed with the process to close the accounts of these projects after which no further transactions will be possible in future'.

While best practice would encourage that accounts should be finalised as soon as it is contractually feasible, the excerpt indicates that first, the problem of failure to close accounts is real and can drag on for years. The projects were executed between the years 2010 and 2013, and five years (2017) later, the accounts were not closed. Second, though the monetary value of accounts was not disclosed (perhaps for confidentiality reasons), the total number of projects listed was 233. The number indicates the extent of the money that could be held in abeyance in project accounts. Third, the client was forced to rely on the Public Financial Management and Accountability Act (the Republic of Botswana, 2012) which is outside the project contract to close the accounts for contractors who were not forthcoming in closing the project accounts.

That background motivated a study to investigate the nature of closure of final accounts, particularly in local authorities in Botswana. The study had two objectives, first, to investigate the level of efficiency and effectiveness in closing the final account of construction projects. Efficiency was viewed as the relative time that elapses for an account to be closed when compared to the time stipulated by the contractual clause. Effectiveness was viewed in terms of the ratio of the final accounts closed to the total, which should have been closed following contractual clauses. The second objective was to identify the major causes of delays in closing the final accounts as perceived by both the major stakeholders, i.e. clients and contractors. This paper, therefore, discusses findings thereof and is divided into four sections. The next section discusses a review of literature on final accounts, while the third section discusses the methodological approach used for the study. The fourth and fifth sections discuss the study findings followed by conclusions and recommendations.large.

2. Contractual Parties, Clauses, Closure and Delay Factors in Final Account – Theory & Practice

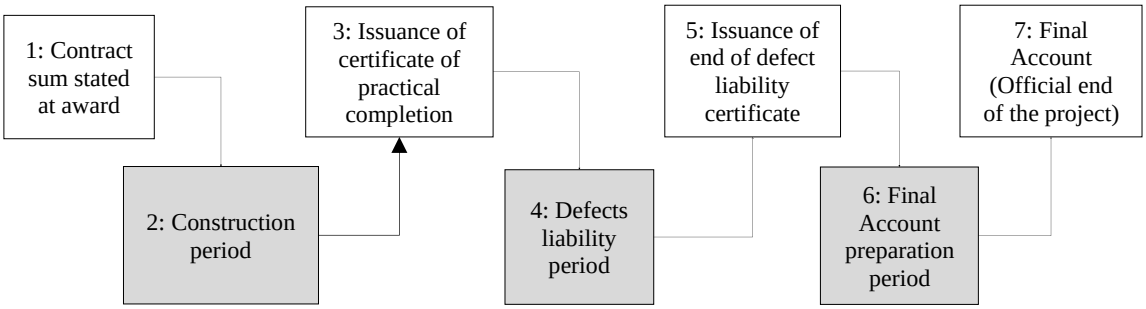
Theory and practice relating to issues of final account was reviewed, and the resulting synthesis is discussed based on the key parties involved in the construction project, the closure process, contractual provisions concerning the research objectives.

2.1 Main parties to the final account closure

The key parties to the preparation, agreement and approval of the final account of a construction project are the client and contractor. Another party typically represents each, for example, quantity surveyor, architect, engineer or a combination of them. In terms of the final account, these two parties must agree that the final account statement represents what transpired during the construction period (El-Shaid, 2016; Kylindri et al., 2012).

2.2 Processes leading to the final account

As already noted earlier, the input for preparing starts from the moment the tender is awarded and a tender sum is agreed by the key parties. Figure 1 indicates four major project milestones (1, 3, 5, and 7) and three activity periods (2, 4, and 6) between the milestones that feed into the drawing up a final account discussed as follows:



Source: Authors

Figure 1: Milestones and activities leading to construction project final account closure

2.2.1 Construction period

The genesis of the final account is the contract sum stated by the contractor at award (Box 1 of Figure 1) and accepted by the employer as the forecast cost towards the construction project. However, both parties know that this amount, for all practical purposes, will never be the exact

final amount at the end of the construction period (Box 2). This is particularly more common in the two-tier negotiated contract system where several items are often incomplete in design at the time of tendering. Usually, several deductions and additions occur to the contract sum for various reasons; for example, the need to actualise the costs of the provisional items and prime costs. Clients too, often order work which was not stipulated in the contract and which inevitably changes the cost estimate. Therefore, due to these unavoidable changes during the project life, it is important to have an effective change control system that ensures that the contractor does not carry out changes believing they have been approved only to find out this is not the case (PMI, 2013; El-Shaid, 2016) and hence end up in a dispute. Good communication, documentation and record-keeping, especially by the contractor, are key aspects in having an effective change control system because these are easily auditable (RICS, 2015). Without a well-managed change control process, the final account negotiations may be protracted and difficult to manage.

2.2.2 Defects liability period

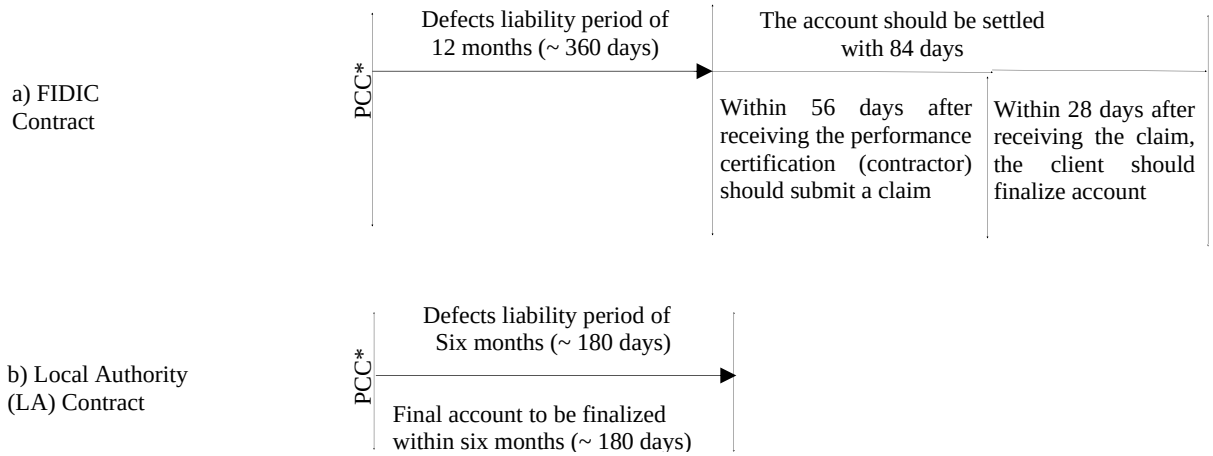
Practical completion milestone marks the end of the construction period as per the contract. As a sign of approval of this milestone, the client's agent issues a certificate of practical completion (Box 3) to the contractor to indicate that the project is officially complete and where possible may be occupied for beneficial use of the client (Kylindri et al., 2012). Practical completion does not always mean that all the work has been satisfactorily completed (CIDB, 2008). Therefore, the defects liability period (box 4) usually starts immediately after the issue of the certificate of practical completion. During this period, which is usually six or twelve months, depending on the type of contract, the contractor must make good, at his expense, all defects appearing in the permanent works reported by the client. In the event, the contractor fails to finish all defects identified in the period, which will not elapse until all the identified defects have been fixed to the satisfaction of the client (CIDB, 2008; Chi Ko, 2009). However, once the client is satisfied that all the works, including minor defects, have been rectified, the client may issue an end of defect liability certificate (Box 5) to the contractor (CIDB, 2008). The issuing of the final certificate means that the contractor is no longer responsible for any damages or defects that may occur to the building (Chi Ko, 2009; Kylindri et al., 2012). This, however, excludes latent defects, where the contractor may be liable for any major defects that manifest in the first five or ten years (depending on the contract conditions) after issuance of the final certificate (CIDB, 2008).

2.2.3 Final account preparation stage

Once the client issues the defect liability certificate (box 5), the onus is on the contractor to prepare and submit a draft final statement of account (box 6). However, best practice indicates that the contractor is at liberty to start at an early stage to prepare a statement leading to a draft final statement of account after receiving a certificate of practical completion (Box 3) from the client. Without repeating a subject well covered in various literature sources (e.g. RICS, 2015, Chi Ko, 2009), the contract sum may be adjusted by items that include, prime cost sums; provisional sums; payments to nominated sub-contractors or nominated suppliers; statutory fees paid by a contractor on behalf of the client; variations (design, quantity, quality, working conditions and sequencing of work). Others such as payments relating to the opening-up and testing of the works; resources price fluctuations; contra claims imposed as a result of the contractor's operations (such as a third-party claim resulting from contractor negligence or the contractual breach, for example, damaging screen wall of a neighbouring property); liquidated and ascertained damages; and release of any remaining retention.

2.3 Contractual clauses relating to final account

The processes relating to the final account is governed by the project contract and some aspects of common law (Chan, 2001; Chi Ko, 2009). There are several standard contract conditions used around the world including the Joint Contracts Tribunal (JCT), New Engineering Contract (NEC), Institution of Civil Engineers (ICE) and Fédération Internationale des Ingénieurs-Conseils (FIDIC). The local authorities in Botswana mainly use the FIDIC contract 1999 Edition, and an adapted form of the JCT contract hereafter referred to as local authority contract (LAC). In terms of Clause 14.11 of FIDIC' s Red Book, 1999 Edition, a contractor must within 56 days after receiving the performance certification submit the final statement of account as illustrated in Figure 2(a). On receipt of the final statement of accounts, the client must settle the account, if there is an agreement, within 28 days. Hence both contracts show that once the statement is verified and an agreement is reached, the client should issue a final statement to settle and close the account (Box 4 in Figure 1). On the other hand, Clause 26(f) of the LAC, states that a contractor must within 180 days after receiving the performance certification as illustrated in Figure 2(b) submit the final statement of account. On receipt of the final statement of account, the client must settle and close the account, if there is an agreement, within the same period.



**PCC –Practical completion certificate*
Source: Authors
Figure 2: Stipulations of FIDIC and LA clauses on the closure of construction projects

2.4 Causes of delay in preparing the final account

Factors affecting final account settlement are varied and inexhaustible. In general, it is the interpretation of the contract clauses; the efficiency at which the final account is prepared; the acknowledgement of the existence, adjustment and the valuation of work that fosters disputes and hence delays in closing the final account. Scholars (e.g. Zakaria et al., 2013; Chi Ko, 2009) have developed frameworks containing common themes indicating the major causes of delays in closing the final account: client-related, contractor-related, and other factors. These themes, together with other literature sources (e.g. Offei-Nyako et al., 2016; Oseghale and Wahab, 2014), are summarised in Table 1. The factors are grouped into four categories, namely contractor, client, environmental and general factors. The general factors are caused by both clients and contractors, while environment-related factors result from issues not caused by neither the client nor the contractor.

Tale 1: Causes of delays in closing the construction project final Account

Category of factors	Delay factors
Client related	• Client's inefficiency in promptly issuing the defect liability certificate • Client's inefficiency in promptly assessing the FA • More work issued during the defects liability period which causes disagreements • Lack of funds to cater for the final payment
Contractor Related	• Contractor's inefficiency in promptly submitting an FA • Too much workload leading to taking a long time to submit FA • Contractors make errors in the FA and hence rejected • Inadequate experience of the contractor in preparing the FA and hence taking more time • Poor record keeping leading to loss of information to support claims • Wrong documentation to support claims leading to back and forth submissions • High workload leading to 'I do not care attitude for an ending project.' • Cost of rectifying the defects far exceeds the claim in the final account (FA) • The contractor goes into liquidation or financial administration
Common to both the client and contractor	• Inadequate understanding of the contract conditions leading to disagreements • Unsuitable contract to handle the complexities of project activities fostering disagreements • Lack of agreement with the work valuation method, process and hence value • The person in charge of preparing the FA is transferred, resigns, retires or dies • Unethical client employees who may collude with contractors to defraud and which may lead to protracted investigations. • Poor change control mechanism leading disagreements of variations and other instructions
Environment-related	• Change in regulations • Force majeure

Source: Zakaria et al. (2013); Chi Ko (2009); Offei-Nyako et al. (2016); Oseghale and Wahab (2014)

3. Methodology

A multimethod approach was used to achieve the objectives of the study, namely, review of project

documents, questionnaire survey and a focus group discussion.

3.1 A review of project records

To investigate the extent to which construction projects remain unclosed in the final accounts, data were first sought from a sample of five drawn from a population frame of 16 local authorities' past contracts in Botswana. A non-probability sampling method (purposive sampling) was adopted. Authors knowledge of the research problem, expertise in project procurement systems in Botswana and LA's willingness to provide project data influenced their judgement in determining the sample (Martinez-Mesa, Gonzalez-Chica, Duquia, Bonamigo and Bastos 2016). Files of 132 practically completed projects were obtained from the five selected local authorities (LAs) and reviewed. Besides, only building construction projects which were beyond the contractually stipulated time for closing the project account and which were implemented in the period between 2013 and 2016 were selected. The period was chosen because the final accounts should have been due for finalisation, and it was thought the accounts would provide complete data for analysis. The scale in Table 2 was used to determine the efficiency and effectiveness of the final account closure process, based on the definition earlier stated.

Table 2: Scale for determining effectiveness and efficiency

Effectiveness & efficiency Scale	**(%) of accounts closed - (%) of accounts closed within time**
Highly effective/efficient	75-100%
Effective/efficient	50-74%
Ineffective/inefficient	25-49%
Highly ineffective/inefficient	0-24%

Source: Adapted from Bush and Burns (2010)

Apart from investigating the time delay in closing the final accounts, document review technique was used to scrutinise project documents in order to identify and understand the possible documented reasons why accounts could be unclosed. After scrutinising the records, it was felt that some of the behavioural reasons might not be documented on paper, for example, if the contractor lost supporting documents to the claim, the reason would not be documented.

3.2 Questionnaire survey and focus group discussion

To get a perception of the possible reasons for the delays in closing the final account, a questionnaire was administered to clients and contractors. Also, a focus discussion was held with eight project officers. The contractors declined to hold a focus discussion, while some claimed to be very busy. In contrast, others seemed to be suspicious of the survey participants' intentions despite the observation of ethical protocols.

The design of the questionnaire was adapted from some of the factors reviewed from existing and related literature shown in Table 1. Apart from seeking the background information on the respondents, the questionnaire had three sections; contributing factors by clients, contractors and general factors. The questionnaire contained common questions for both groups. It required respondents to indicate, based on their experience, whether a factor was perceived as frequently contributing to the delay in closing the final account. A Likert scale was used to rate the factors contributing to the delay of the closure of final accounts with the extreme ends of the scale being ...frequently contributed to the delay in closing the final account (5) and ...does not contribute at all to the delay in closing the final account (1). Internal reliability was conducted based on composite reliability (CR) to test the internal consistency of the questions. A total of 21 questions were included in the questionnaire, which had a score of 0.8 and above and three were dropped due to a lower test (α) score (scales not fit for purpose) (Peterson and Kim, 2013). Besides, each section ended with an open-ended question that provided respondents with an opportunity to state any other relevant aspects on the issue of final account closure. The validity of the Questionnaire was tested, and this is described in detail in Ssegawa, Rwelamila and Mogome (2019).

3.3 Sampling technique

Purposive sampling was used in sampling of LA representatives (clients) who were willing to participate in the study. A total of 48 officers agreed to participate in the study, but only 34 returned the completed questionnaires. An average of three categories of officers from each LA; architect, engineer and quantity surveyor completed the questionnaire.

3.4 Questionnaire administration and response rate

The ethical protocol was observed for both groups, especially in explaining the study purpose, seeking consent and voluntary participation in the study and ensuring anonymity for each participant. The entire data collection took a period of five months i.e. between July and December 2017. Collected data from project accounts, the returned questionnaires and focus group discussions were analysed on a spreadsheet.

The list of contractors was drawn from bidding documents in the selected LAs. A total of 289 contractors were identified, and questionnaires were distributed through fax, e-mail and drop-off. A total of 123 questionnaires were returned though 11 questionnaires were disregarded because the contractors had less than five years of industrial experience. The five years and above threshold were considered adequate to provide an insight into the research problem under investigation. The response rate was, therefore, 38.8% (112, i.e. used questionnaires), which was considered adequate for survey research (Ramshaw, 2018).

3.5 Method of analysis

The findings are discussed in two sections, the efficiency and effectiveness of the closure of final accounts and the causes of delay in the formal closure of a construction project in the final account. The scores of clients (Cl) and contractors (Co) computed from participants' responses on the factors divided by the maximum composite agreement score (CGS) to normalise the scores using the following Equation 1. The (CGS) isolates factors having

the highest scores agreement from the clients and contractors as the dominant causes of delays.

$$CGS = \frac{\sum_{i=1}^{20} Cl_i \times Co_i}{(Cl \times Co)_{max}} \quad (1)$$

The Cl and Co responses for factors i =1 to 20, are divided by the maximum CGS in order to normalise the figures in percentages scores.

4 Results and findings

The discussion of results is centred on achieving the two objectives of the study, i.e. the efficiency/effectiveness of the closure of accounts and the perception held by the key stakeholders as to the causes of the delay of the process.

4.1 Efficiency and effectiveness of the closure of final accounts

Before a discussion of the findings on efficiency and effectiveness of the closure of final accounts commences, the profile of the projects which were selected for study is briefly highlighted to provide the context of the findings.

4.1.1 Profile of selected projects

Table 3(a) indicates that 132 projects were selected from five LAs, consisting of 69 (52.3%) new developments and 63 (47.7%) maintenance projects. FIDIC contracts were used for new developments and spanned 12 months or more while LA contracts were used for maintenance projects spanning a duration of up to six months. Table 3b (i-iii) indicates that the median contract value for the sampled projects was P1, 048,320.00 (1US$=BWP9.65 in January 2018). The highest and lowest contract values were P19, 641,038.60 and P330, 400.00 respectively for new and maintenance projects.

Table 3 (a)-(b): Profile of Selected Projects

a) LAs' Projects

Local authority	New developments (FIDIC contracts)	Maintenance (LA contracts)	Total
LA1	23	10	33
LA2	17	14	31
LA3	10	17	26
LA4	11	20	28
LA5	8	6	14
Total	69	63	132
Ratio	52.3%	47.7%	100%

b) The Financial Profiles of Projects

i. Median contract value	P1,048,320.00
ii. Maximum contract value	P19,641,038.60
ii. Minimum contract value	P330,400.00

4.1.2 The effectiveness of final account closure

Table 4 (a) shows that 72 (54.4%) of the final accounts outs of 132 studied were closed. This indicates that LAs marginally effective (based on the scale given in Table 2) in closing the accounts. Table 4(b) shows that the amount of money held in unclosed final accounts (45.6%) was P9, 401,115.10. It is most probably that the amount will be higher if all sixteen LAs were studied. Also, since the value of contracts executed by LAs is often lower than that of, say, DBES, Department of Roads or Water Affairs, it means the value of unclosed final accounts may be enormous in the entire public construction sector of Botswana.

Table 4 (a)-(c): Level of effectiveness for closing final accounts

a) State of final accounts of the project studied	**Proportion**
i) Closed accounts	72(54.4%)
ii) Unclosed accounts	60(45.6%)
	132(100.0%)

b) Amount held in the 60 unclosed final account	**P9,401,115.10**

c) Type of project involved	**Proportion**
i) The proportion of unclosed accounts within the selected sample of maintenance projects	45/63(71.1%)
ii) The proportion of unclosed accounts within the selected sample of development projects	32/69(46.4%)
Total	132(100.0%)

Table 4 (c) also indicates that the proportion of unclosed accounts (71.1%) within the selected sample of maintenance projects is higher than the proportion of (46.4%) of unclosed accounts within the selected sample of development projects. This could be because (i) maintenance jobs have many uncertainties, as the scope of work and quantities are difficult to determine during tendering and (ii) the frequent changes in the scope of work which always occur at the execution stage. Besides, because most maintenance jobs are of low value, they are carried out by small-sized contracting firms who are often newcomers in the industry and are characterised with inefficiency as lack of capacity (i.e. labour and equipment) and inexperience, particularly in estimates preparations. The preceding are most likely the reasons why projects are not officially closed when the costs of making good the defects exceed monies held as retentions.

4.1.3 The efficiency of final account closure

Further analysis was carried out on the 72 (54.4%) projects for which accounts were formally closed, as shown in Table 4(a) to determine the level of efficiency using elapsed time. Figure 3 indicates that 42% (30) of the final accounts were closed in one month while the rest (58%) were closed in periods beyond one month (with 27% being closed after six months and over). The longest period of closure was nine months and involved three projects. This result suggests that the final account closing regime is not efficient. This outcome reinforces the results indicated in Table 4 that the final account closure regime in the LAs is marginally effective, i.e. though more accounts by a simple majority were closed, most of them were closed beyond the stipulated time in the contract.

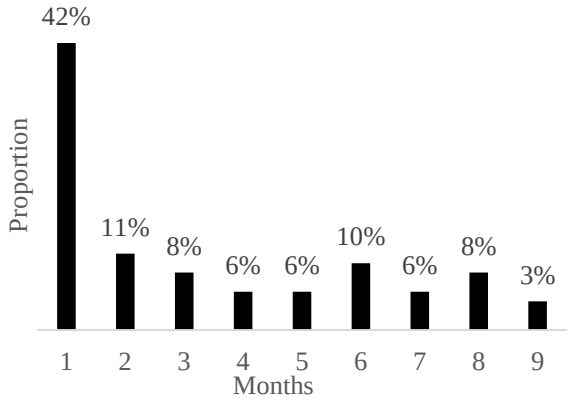


Figure 3: Time that elapsed before the final accounts were closed

When the project documents relating to these accounts were scrutinised, it was discovered that there were 21 cases where the contractor delayed in submitting the claim to the client. In the other 14 cases, it was the client who delayed in processing the final account. Furthermore, there were 12 cases where the contractor was given additional work during the defects liability period. This essentially amounted to extending the contract period and hence the final account settlement period. There was also an interesting scenario in one of the LAs that had 11 projects, the client's representative grouped the final account claims to process in one month (e.g. in April and December). Some of the projects took a long time to process while others were processed in a shorter period. Though researchers did not interrogate the officer as to why this was done, it demonstrates a convenience to process all accounts at once than anything else. Lastly, it is noteworthy that several cases had more than one reason for the delay.

4.1.4 Age of unclosed accounts

The unclosed final accounts of 60 (45.6%) projects (see Table 4) were scrutinised. Figure 4 indicates that 40% of them had remained unclosed for less than a year while the majority (60%) of the project accounts had remained unclosed for more than one year. Moreover, four (7%) projects' final accounts had remained unclosed for three years. On scrutinizing the documents from this group, it was noted that most of these unclosed projects were of maintenance types that were executed by mostly small (class OC& A) and medium contractors (class B). The documents of these projects contained some insightful correspondences which indicated some kind of disputes, for example, one of such correspondence read *'... according to the terms of reference, the aspects which you refer to in your communication dated... were not included or even referred to .....It would be prejudicial to us to expect them to be carried out without adequate compensation...'* As Canter (1993) and Lai & Yik (2007) noted, maintenance contracts contain many uncertainties due to lack of precisions in the work estimates. Such are usually the potential causes of disputes and eventually delays in the final reconciliations. The rest of the projects had two symptomatic reasons why they had not been closed either the contractors were 'dragging their feet' to rectify the defects or had simply not attended to the defects despite notification. The actual reasons were not documented and why it was necessary to augment document review with a survey of both the client and contractor perceptions.

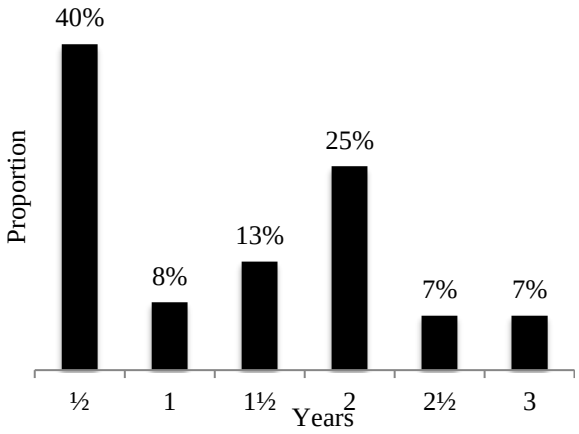


Figure 4: Age of unclosed final accounts

4.2 Causes of Delays for Closing the Final Accounts

A discussion of the causes of delays for closing the final accounts is preceded by a brief description of the profile of respondents to underscore their capacity to provide an in-depth insight into the topic of investigation.

4.2.1 Profile of respondents

A total of 166 questionnaires were analysed consisting of 34 clients' representative and 132 contractors (who had worked for any of the five LAs within the period under review).

Table 5 (a)- (d): Profile of respondents

a. The profession of client representatives (drawn from 5 LA)		
	No.	**Ratio**
Quantity surveyors	11	32%
Engineers	13	38%
Architects	10	30%
Total	34	100%
b. Client representatives' experience		
Years	**No.**	**Ratio**
5 -10	10	29%
11-19	14	41%
20-29	7	21%
30 and over	3	9%
Total	34	100%
c. Class of contractors		
No.		**Ratio**
Small (OC & A)	48	36%
Medium (B & C)	76	58%
Large (D & E)	8	6%
	132	100%
d. Contractors' experience		
Years	No.	Ratio
5 -10	14	11%
11-19	74	56%
20-29	32	24%
30 and over	12	9%
Total	132	100%

Table 5(a) shows there was a right mix of the built environment professionals (quantity surveyors, engineers, and architects) from each LA. Table 5(b) indicates that a small number (29%) of client representatives had industry experience of 10 years and below while the majority (71%) had experience stretching from 11 years to over 30 years. Table 5(c) indicates majority (58%) of the contractors are in the medium category (class B&C), followed by (36%) the small category (class OC & A) and a few (6%) in the large category (Class D&E). This was commensurate with the value of building projects undertaken by local authorities. Table 5(d) further indicates that the majority (89%) of the respondents had substantial experience in the industry of 11 years and above. The profile of respondents indicates that they could provide valuable insights into the causes of delays in closing the final account.

4.2.2 Causes of delay in closing the project in the final account

The mean responses (including computed composite scores) by contractors and clients regarding causes of delay in closing the final account are summarised in Table 6. It can be seen from the Table that opinions of the clients and contractors differ on the factors' impact on the delay in closing a project in the final account. For example, the client indicated with a score of 4.70 that it is the 'contractor's lack of timely preparation and submission of draft final account to client' that is significant in causing the delay. Contractors had a contrary view with a score of 1.21. Similarly, Table 6(b), it is the contractors' opinion that 'client's failure to understand or misinterprets the contract conditions' is a significant delay factor in closing a project in the final account. Contractors are of the contrary opinion on the factor's level of impact on the delay.

Table 6: Causes of delay in closing final accounts

Delay factor	Response Rating		Composite Score	
	Client (μ_{cl})	Contractor (μ_{c0})	(μ_{cl} x μ_{c0})	Normalised (%)
a. Contractor - related factors				
1. Contractor's lack of timely preparation and submission of draft final account to the client	4.70	1.21	5.69	42%
2. Lack of understanding of the contract conditions by the contractor	4.53	1.67	7.57	56%
3. Delay in submission of accurate claims by the contractor.	4.40	1.74	7.66	57%
4. Contractor's failure to agree to the valuation of work.	4.13	1.24	5.12	38%
5. Submission of inadequate documentation supporting the claim by the contractor (even where they exist)	4.13	1.83	7.56	56%
6. Poor records keeping by the contractor leading to a lack of supporting documents for the claim	4.07	1.52	6.19	46%
7. Errors in the claim submitted by the contractor	4.00	1.48	5.92	44%
8. An inadequate experience by the contractor in the valuation of work	3.93	1.60	6.29	47%
9. The person in charge of final account is retired, dead or transferred from project or workstation.	3.73	2.52	9.40	70%
10. The workload from other projects by the contractor and hence not being able to prepare and submit a draft final account to the client.	3.67	2.20	8.08	60%
11. Cost of rectifying the defects far exceeds the outstanding balance	3.60	3.74	13.46	100%
b. Client - related factors				
12. Failure by the client to understand the contract conditions.	1.60	4.71	7.54	56%
13. Lack of adequate available funds for the project by the client.	1.20	4.62	5.54	41%
14. Client taking a long time to agree and certify the claim.	2.60	4.48	11.65	87%
15. The person in charge of final account from the client's side is retired/dead/disappear or transferred from project or workstation.	1.73	4.43	7.66	57%
16. Poor financial management by the client.	1.53	4.38	6.70	50%
17. Lots of extra work issued by the client during Defects Liability Period which brings up disputes	1.53	4.24	6.49	48%
c. Contractual provisions-related factors				
18. Contract conditions biased to one party which eventually bring disputes and hence affect the final account	1.20	4.26	5.11	38%
19. Contract used is not comprehensive to guide the final account	1.47	4.07	5.98	44%
20. Contract used is too complicated to be understood by both parties.	1.53	3.76	5.75	43%

Lack of disagreement relating to the challenges that face the construction industry in Botswana is not a new phenomenon. An earlier study observed that there is always a blame game between the service providers and the clients (BOCCIM, 2008). However, the same study concluded that both parties share responsibility in the sector's challenges. The above results indicate that both parties contribute to the delays in closing the final account.

Figure 5 shows that nine factors have CGS normalised percentage score of more than 50%. However, four factors which had a higher CGS percentage score of 60% and above were considered the major causes of delay in closing the accounts. These are:

i) cost of rectifying the defects far exceeds the outstanding balance (13.46 or 100%)
ii) the client takes longer time to agree and certify the claim (11.65 or 87%)
iii) the person in charge of final account (for the contractor) is retired, transferred, resigns or dies from project or workstation (9.40 or 70%).
iv) The workload from other projects makes the contractor unable to prepare and submit a final account to the client (8.08 or 60%).

It is interesting to note that researches on the impact of 'Contractor's failure to agree to the valuation of work' on delay in construction project finalizations in the final account (see item 4 in Table 6), is sparse. However, it has in this study composite and normalized percentage scores of 5.12 ad 38%, the factor by name, is suggestively a cause of delay in final account preparation.

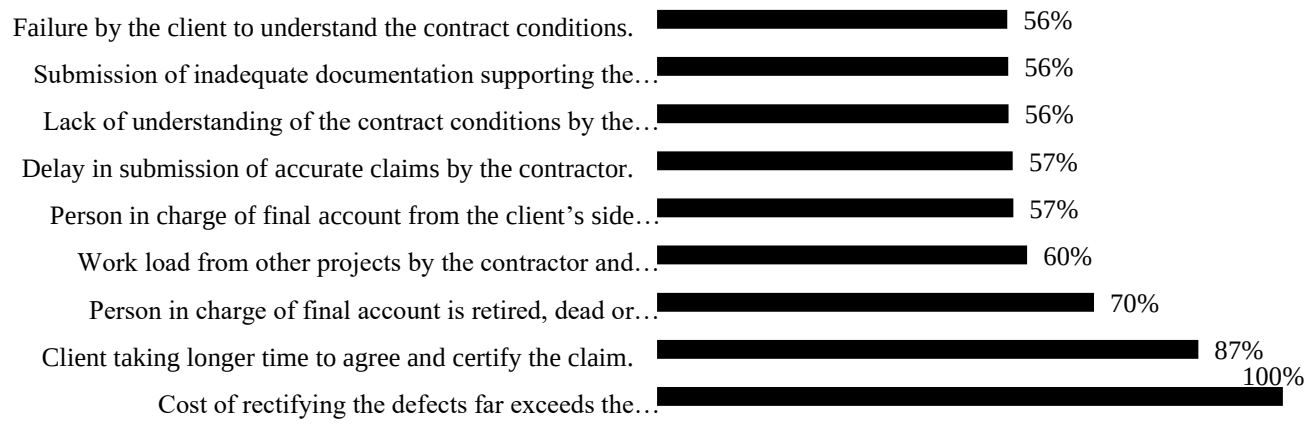


Figure 5: Significant delay factors in construction project closing in the final account

The first set of factors can be corroborated with the findings from document review, where several contractors abandoned sites without further communication despite correspondences from clients. The second set indicates that clients also contributed to the delays while both parties cause the third factors. Other factors alluded by BOCCIM (2008) indicated that contractors, especially those in the medium and small categories, sometimes take jobs above their carrying capacity, moreover, in different locations of the country. The study further noted that they prioritise jobs; therefore, a job which is supposed to be at completion stage may be of a lower priority than that which must commence soon or an on-going job which must not be delayed.

4.3 Discussion of findings

The findings indicate that there is low efficiency (42%) and marginal effectiveness (54.4%) in closing the accounts. Chi Ko (2009) noted that the challenges of backlogs in settlement of final accounts are a result of the actions and inactions of either party. For a project account to remain unclosed for a long time (or sometimes forever) has many implications. First, it shows the project is not entirely successful as there is an aggrieved party who could be the client or contractor (Cheung et al., 2000). Secondly, the contractor's cash flow is reduced as money tied in the final account in the form of a claim or retention. For the clients, the money stays in abeyance in project accounts when it could have been used on other developments. It could be 'held-up' in a client's account for five years as stipulated by the Public Financial Management and Accountability Act of Botswana (the Republic of Botswana, 2012). In a focus discussion, the project officers intimated that it is difficult to determine the contracts on the projects of contractors who abandon their jobs. They noted that in some instances, they are politically connected such that the politicians interfere with decisions to terminate their contracts or to blacklist the contractors. Ntshole (2014) also, noted that terminations of contracts and hiring a new contractor eventually do not work in favour of the projects. That is why the Department of Engineering and Building Services, for instance, relied on the Financial Management and Accountability Act which allows sums not claimed within five years to be returned to the consolidated fund. Tighter contract conditions are therefore needed that incorporates explicitly the clause that a contractor who abandons the site without addressing the defects after the defect liability period, the client reserves the right to engage another contractor to rectify the defects, be paid from the withheld money and if not enough, the client should claim the balance from the contractor through legal channels (Ntshole, 2014). Lastly, the time lapses make it difficult to get to terms with the issues that caused the delay or disputes, for example, key personnel who had the information on the case on either side might have left their employment. Such situations lead to costly, time-consuming, undesirable and protracted negotiations, arbitrations or ligations.

5 Limitations of the study

Despite the inherent limitations of data sourced from only five out of the sixteen LAs in Botswana, it nevertheless provides a useful insight into the challenges of closing a construction project in the final account.

6 Conclusions

Project closing in the final account is the finalisation of a project and indicates an agreement between the contractor and the client on the project activities and associated financial history. The agreement on the contents and closure of the final account is one of the indicators of project management success because it brings an amicable closure to the contract.

The study indicated that the closure process based on the sampled projects in the five selected LAs was marginally effective as there were 54.4% of the accounts closed. Secondly, for those which were closed, the process was inefficient as only 42% of the accounts were closed within one month of the stipulated contractual terms. For unclosed accounts, it meant that money is tied up, which could have been used by the contractors or clients; for example, over P9.4 million was held in unclosed accounts. Three significant causes of delay in the closing of the construction project final account within the stipulated clauses of contract conditions were found in the study. First, contractors sometimes find the cost of rectifying the defects far exceeding the outstanding balance, they, therefore, abandon the projects and hence never submit final account. Secondly, the clients also take longer time to agree and certify the final claims. Thirdly, in the contracting firms, there are situations where persons in charge of final account retire, resign or die. Project information is, therefore lost or takes a while to assemble. Contractors and clients, therefore, called to improve on the fulfilment of their contractual responsibility by deliberate plans for increases in the efficiency and effectiveness of final account closures.

The fact that most of the modern standard forms of contracts in various countries (including Botswana) contain provisions upon which the engineer, the architect, quantity surveyor, cost engineer and project manager are obliged to settle the final account and issue a final payment certificate, actively strengthens the importance of a project schedule and projects cost parameters. Since a successful project is measured based on achieving positive results for all project parameters, including meeting a project schedule and budget, failure to settle the final account and issue a final payment certificate, point to the failure of meeting project schedule and cost requirements (budget), thus a clear outcome of project failure. It should be acknowledged that failure to settle the final account of a project strongly signify poor management of construction projects.

7 Implications of the research findings

Since half of the construction projects executed by the Botswana LAs are found not to formally close in final accounts, it implies that: (i) references cannot be correctly made to many past project costs in Botswana as certain works and values are not concluded; and (ii) past references and use of cost figures of construction projects for example in approximate or preliminary estimates have been in error and information derived might have misled the users.

8 Recommendations

Based on the drawn inference that only the contractors who discovered that retention monies would not be enough to rectify the defects in compliance with the contract condition clauses on liability, the paper recommends that all adopted contract conditions be modified to focus on nipping the challenge in the bud as well as deterring instrument to future defaulters. The suggested modification: 'it shall be mandatory for contractors to bring the project under tender to a formal closure through final account documentation within a specified period, defaulting contractors to be blacklisted from future contract awards in Botswana LAs'. Ordinarily, since contractors can hardly suffer financial losses and to be fair to other stakeholders, the paper suggests that consultants and clients should objectively consider contractors' claims arising from defects rectifications in the defect liability period. This is provided such defects were neither caused by poor materials nor are traceable to poor workmanship. These hopefully will mitigate the challenge if followed.

9 Area of further studies

Furthermore, this paper suggests that the study be upscaled to include the rest of the LAs and other project management entities, for example, housing, water and roads in Botswana, to confirm the results of the study.

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Environmental and Socio-Economic Impacts of Ojodu-Berger Road Upgrade, Lagos, Nigeria

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Abstract

Extensive road project in large cities produces diverse impacts. This study attempts an assessment of the environmental and socio-economic effects of a recent road upgrade, the mitigating measures of adverse effects experienced and their effectiveness in Ojodu Berger community, a major transport node in Lagos, southwestern Nigeria. Using a survey research design through questionnaire administration, 120 respondents comprising of 50 residents, 40 traders and 30 transport operators were sampled using the purposive sampling technique. The Relative Significance Index (RSI) of project impacts was measured using 27 variables as identified in the literature and general observation of situations in the project environment before the survey. On a 5-point Likert scale at the pre-construction, construction and post-construction phase of the project. The study reveals poor environmental conditions at the pre-construction phase, which became escalated in the construction phase; noise pollution is the most significant impact (RSI = 4.36). At the post-construction phase, encroachment on pedestrian facilities is the most significant impact (RSI = 4.20). Socio-economic impacts such as increased rental value, unemployment and displacement of businesses were also significant. The Mean Index (MI) of 3.14 for the construction phase impacts was the highest compared to 3.00 at the pre-construction phase and 3.02 at the post-construction phase. Mitigating measures against adverse impacts were both effective and ineffective, while some adverse impacts were not mitigated. There was no clear evidence that an impact study was done before project implementation. The study recommended strong government commitment to environmental and social impacts assessment of road development, more robust stakeholders' engagement for the formulation of strategies and measures to address the adverse impacts of similar projects in the future.

Keywords: Construction, Environmental, Impacts, Social, Upgrade.

1. Introduction

The expansion and provision of road infrastructure around the world have been unprecedented in the last two decades (Alamgir et al., 2018). Since 2000, the length of official roads has increased by 12 million kilometres worldwide, and it is expected that there will be a further increase of about 25 million kilometres to be built by the year 2050 (Dulac, 2013). This massive expansion in road infrastructure provision can be attributed to governments' set vision to make public, economic and social services physically more accessible to all the people in the rural and urban areas around the world (ERA, 2012; Arethun and Bhatta, 2012). Provision of access routes has higher potentials for far-reaching implications on the bio-physio-chemical and socio-economic environment of the host community as well as the living conditions of dwellers (Soneye, 2007).

Around 90% of all new infrastructure projects are occurring or expected to occur in developing nations of the world (Dulac, 2013). In Africa, the 35 major 'development corridors' being planned or currently in progress would crisscross the continent, collectively exceeding 53,000 km in length (Laurance et al., 2015). Roads that are effectively located and constructed can provide positive outcomes for economic growth and social integration, and access to larger urban markets for local producers (Bryceson et al., 2008). On the contrary, roads that are poorly planned or executed can create numerous environmental (Lawrence et al., 2015), economic (Collier et al., 2015), and socio-political problems (Bambach and Mitchell, 2015). For example, a

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proposed 'superhighway' in Nigeria would have cut through much of the remaining habitat, allowing the government to seize extensive traditional community-owned lands while providing questionable economic benefits (Mahmoud et al., 2017).

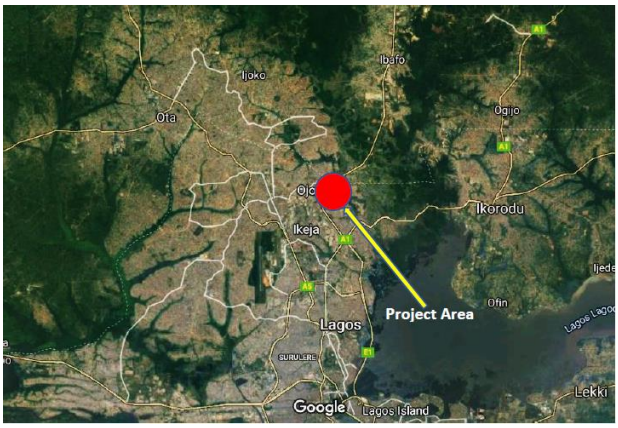
In the last four decades, there has been a global concern for sustainable development with environmental protection as one of its primary focus. This is to ensure that adverse impacts arising from physical developments such as road construction in cities are adequately managed. In Nigeria, there have been remarkable improvements in the development of road infrastructure since the national oil boom of the early 1970s (Soneye, 2010). The impacts of these road projects are not only permanent but irreversible (Ojo, 1988). However, these impacts are hardly monitored for necessary action due to limited planning consideration and institutional gridlocks amongst regulatory agencies in the decision-making process (Soneye, 2010) coupled with a dearth of required records and analytical tools for operations. This trend is against global practices of sustainable development.

This study explores the environmental and socio-economic impacts of road upgrade in Ojodu Berger, a nodal community in Lagos, Nigeria based on local perception to provide information on the effects of these projects before, during and after implementation and using the outcome to influence the direction of similar projects in the future. Preliminary studies revealed that the project lacked an environmental impact study, hence, the impacts before, during and after construction and the mitigating measures and their effectiveness were investigated.

2. The Study Area

Lagos is the most populous city in Nigeria and third in Africa after Cairo and Kinshasa. The population is currently estimated at 23million people which is approximately 11.5% of the country's population. The vehicle population of Lagos is about 3 million and about 93% of passenger and goods movement is by road. Over 95% of the public transport system is controlled by the informal sector (LASG, 2019). Ojodu-Berger, the study area is a nodal community and situated along Lagos-Ibadan expressway at the northern boundary of the metropolis and Lagos state. This location makes the community a significant transport and commercial node mixed with residential areas. It is the first drop-off point for people coming into Lagos from other parts of the country. This situation puts much pressure on the community in the form of heavy vehicular and pedestrian traffic leading to congestion on the Lagos-Ibadan expressway and vehicular/pedestrian conflicts in the commercial and terminal areas. Besides, many cases of road traffic accidents are recorded in the community.

The haphazard land use structure, weak planning control of commercial and road terminal activities, and the absence of pedestrian facilities for commuters transferring from one side of the Lagos-Ibadan expressway to the other compound the chaotic situation and therefore necessitates the upgrade of roads and intersections connecting to the expressway for good traffic flow. The construction of road terminals and an extensive pedestrian bridge were also done to inject sanity for proper management of traffic in the neighbourhood. Based on preliminary findings, there was no evidence of a detailed environmental impact study on the project. Besides, the researcher observed at the construction phase of the projects that mitigation efforts adopted by the contractor to address some of the visible adverse impacts were inadequate and uncoordinated. This situation provides the basis for this study.



Source: Google map (2017)

Figure1: Location of Project Area within Lagos Megacity

3. Literature Review

3.1 Environmental Impacts of Road Projects

The construction of roads can affect biodiversity both directly, as an immediate consequence; or indirectly, as a result of human activities that are facilitated by new roads (Trombulak and Frissell, 2000; Laurance et al., 2009). These direct effects can be in the form of vehicle and wildlife collisions (Clevenger et al., 2003), reduced reproductive capacity of sensitive species as a result of chronic road noise (Kociolek et al., 2011) and behavioural avoidance of roads by endangered animal species (Whitworth et al., 2015). Besides, roads can also function as barriers limiting the movements of animals between various habitats and territories.

Road infrastructure can also produce impacts that are beneficial to the sustainable development of countries and cities. The benefits from efficient road transport are felt at all levels of the society, directly or indirectly, such as to include improved national economy, social income, wealth and job creation, health care, public transport and general service delivery. Improvement of all these areas is desirable for the current national aspirations, including inter-sectoral growth collaborations (Perkins, 2011). The attainment of the Sustainable Development Goals by 2030 is heavily reliant on the provision of infrastructure, efficient road network being the key unit.

Development of new roads and improvement of existing facilities have potentially adverse effects on the physical environment and social well-being of the communities as well as natural habitats. Among the potential negative impacts from road construction projects could include: environmental pollution from construction activities, the risk to health and safety of the residents and employees, increased surface runoff, socio-cultural changes including demolition of structures, displacement

of human settlement/commercial centres, increased traffic, increased ambient air pollution, increased potential for road accidents, flooding and associated disasters among other impacts. Other anticipated impacts from road projects are the destruction of land, vegetation, change in land use pattern (Wegener, 2004), and possible interference with natural eco-balance.

3.2 Socio-economic Effects of Road Projects

The proponents of road projects frequently portray their proposed projects as a panacea for many social aspirations (Laurance et al., 2014). In most cases, however, the broad societal risks that new roads can create are rarely identified or weighted adequately (Laurance et al., 2015). The construction of roads in remote areas, for example, can lead to increases in illicit logging, mining, poaching, smuggling and drug production (McSweeney et al., 2014). Such practices can exacerbate environmental and social problems, defraud governments of tax and royalty revenues, and require increased expenditures for monitoring and law enforcement (Asner et al., 2013).

During the initial phases of development, real or perceived inadequacies in community consultation or forced land reclamations can be flash-points for conflict. Community dissatisfaction may be aroused if benefits from roads are distributed inequitably, such as the inadequate provision of employment opportunities for residents or perceived government corruption. Road projects in frontier areas commonly lead to an influx of migrant workers or colonists, with potentially adverse impacts on local inhabitants (Suarez et al., 2009). Among the undesirable effects are increased demands for 'immoral' services such as prostitution and black-market products (Clements et al., 2014), an increase in sexually transmitted infections (Carswell, 1987) and an erosion of traditional social structures (Rudel, 2005). Such challenges can provoke community conflict, potentially delaying road development or increasing its economic costs. Some frontier communities living in the aftermath of new roads are highly polarized between 'locals' and 'migrants' (Colombijn, 2002). Social risks do not end once a road project has been completed. For instance, vehicle crashes have substantial socio-economic impacts, averaging 3.3% of total GDP in high-income countries and at least 1.1 to 2.9% of total GDP in lower-income countries (Wijnen and Stipdonk, 2016).

New roads act as invasion corridors, facilitating incursions of human and animal pathogens and disease vectors (Laurance et al., 2009). People living near roads in India, Brazil, and Uganda have reported increased incidences of dengue fever, malaria and HIV, respectively (Carswell, 1987). Exotic plants and animals, including many species deleterious to humans or agriculture, often use road verges to invade new lands. Little fire ants (Wasmannia auropunctata), for example, invade 60 times faster along logging roads in African rainforests than in undisturbed forests; the intense stings from this species repel and even kill livestock, wildlife and people (Walsh et al., 2004).

For indigenous groups in remote areas, new roads can have irrevocable effects (Colombijn, 2002). Roads have decimated some indigenous populations via introduced diseases and forced or voluntary migration (Koji and Hoban, 1997). In the 1970s, the construction of the Trans-Amazon Highway led to the deaths of 45% of one indigenous group in a single year (Hecht and Cockburn, 2010). Roads penetrating tribal territories can lead to an influx of non-indigenous squatters and land speculators seeking to appropriate land titles. Additional impacts such as alcohol abuse, prostitution, illegal mining and social domination by colonists can arise (Singleton et al., 2004). Roads penetrating remote areas are often perceived as drivers of increased aggression, lawlessness and other 'frontier society' behaviour (McSweeney et al., 2014).

Transportation projects can take many forms (OECD, 2002). According to Banister and Berechman (2000), transportation developments that have taken place since the beginning of the industrial revolution have been linked to growing economic opportunities. At each stage of human societal development, a particular transport mode has been developed or adapted. However, it has been observed that throughout history that no single transport has been solely responsible for economic growth. Instead, modes have been linked with the direction and the geographical setting in which growth was taking place. For instance, major flows of international migration that occurred since the 18th century were linked with the expansion of international and continental transport systems (Wanjiku, 2014). Roads are a critical enabling condition for improving living conditions in rural areas. However, the distribution of socio-economic benefits resulting from a rural road is a separate issue, and there are no guarantees or inherent mechanisms to ensure that these benefits will be distributed equitably between the poor and the non-poor in communities (Asian Development Bank, 2006).

Road construction activities themselves have been found to generate significant economic growth. According to the European Investment Bank's (EIB) 2002 study "Contribution of Major Road and Rail Infrastructure Projects to European Development", out of 14 road infrastructure construction projects, ten had a Return on Investment (ROI) of at least 13%, and only one resulted in a net loss. Socio-economic impact assessment focuses on evaluating the impacts the development has on community social and economic well-being (Edwards, 2000). This analysis relies on both quantitative and qualitative measures of impacts. Development impacts are generally evaluated in terms of changes in community demographics, housing, employment and income, and aesthetic qualities of the community.

4. Research Methodology

This study compares the environmental and socio-economic indices of the study area before, during and after construction towards road upgrade to establish the degree of project impacts. The study relied on local perception and used mixed methods (quantitative and qualitative) to source data from residents, traders and transport operators in the study area with the aid of structured questionnaire, interviews and focus group discussions with representatives of transport unions and personal observations. This method was used by Budiyati and Wahyu (2014) for the study of social and economic impacts of national road improvement in Kabupaten

Dompu, Nusa, Tenggara Barat, Indonesia. The primary data obtained from respondents include the socio-economic characteristics of the people, the environmental and socio-economic situation before the project and the impacts arising from the construction of roads, terminals and the pedestrian bridge and the mitigating measures adopted to limit adverse impacts. Google map was used to establish the boundary and coverage of the project area.

Convenient sampling technique was adopted in determining the sample size for this study as surveys and questionnaire administration were carried out based on the availability and readiness of respondents for interview. Besides, this technique was used due to the unplanned nature of the area and a dearth of information highlighting the number of people per respondent category. For ease of sampling, the study area was divided into three zones: residential, commercial and road terminals to obtain information from residents, traders and transport operators, respectively. A convenient selection of 120 respondents from the three zones was adopted, and this includes 50 residents, 40 traders and 30 transport operators. The study was limited to a radius of 0.5Km from the location of the road upgrade.

Table 1: Sample size distribution

Zone	No of respondents	%
Residential	50	44.5%
Commercial	40	33.3%
Road terminals	30	22.2%
Total	120	100.0%

Source: Author's study

Based on respondents' perception, 27 environmental and socio-economic variables as identified in the literature (Lagos Metropolitan Area Transport Authority, 2012; Morgan, 2012; Ijigah, Jimoh, Aruleba & Ade, 2013) were measured on a 5-point Likert scale to establish the Relative Significance Index (RSI) of the road project impacts at the pre-construction, construction and post-construction. The 5-point scale of 1 – 5 is presented as follow: (1 = very low, 2 = low, 3 = moderate, 4 = high, 5 = very high). An impact is considered significant when the associated RSI is higher than the Mean Index (MI) and vice-versa. The RSI is calculated as:

$$RSI = \frac{Significance\ Weight\ Value\ (SWV)}{Total\ number\ of\ responses\ (n)} \quad (1)$$

Where: SWV = 1r1 + 2r2 + 3r3 + 4r4 + 5r5
r = Ratings of respondents

$$SWV = \sum_{i=1}^{5} XiYi \quad (2)$$

Where: X = number of respondents,
Y = weight assigned to an impact by respondents

$$Mean\ Index\ (MI) = \frac{\sum RSI}{Na} \quad (3)$$

$$Mean\ Deviation\ (MD) = MI - RSI \quad (4)$$

Where: n = Total number of responses (sample size)
r = Ratings of respondents
Na = Count of identified impacts

Based on respondents' perception, the effectiveness of mitigating measures against adverse impacts of the project was classified as 'effective' or 'ineffective'. Effectiveness of mitigating measures was based on the percentage of respondents. A mitigating measure is considered effective when not less than 50% of respondents rated or considered it as such.

5. Findings and Discussion

The section contains the analysis of the environmental and socio-economic situations of the project area at the pre-construction, construction and post-construction phase and the effectiveness of mitigating strategies against adverse impacts of the road project based on local perception.

5.1 Pre-construction Phase (Baseline) Situation

The pre-construction phase represents the baseline for the study. The analysis presented in Table 2 represents the prevailing environmental and socio-economic situation of the project area at the pre-construction phase. The Mean Index (MI) established from the 27 variables is 3.00 and 12 (eight environmental and four socio-economic) of these variables were significant as they have RSI higher than 3.0. In order of significance, the twelve variables include children access to school (3.84), traffic congestion (3.77), noise pollution (3.76), access to health facilities (3.65), access to shopping (3.63), poor road terminal (3.55), hindered access to the neighbouring community (3.51), air pollution (3.49), poor road condition (3.45), access to recreation facilities (3.21), vehicular/pedestrian conflict (3.03) and poor sanitation (3.01).

The results suggest that before the road project, the neighbourhood had always experienced adverse environmental conditions such as high levels of traffic congestion, noise pollution, poor road terminal, air pollution, poor condition of roads, vehicular/pedestrian conflict and poor sanitation. The unplanned land use, poorly organised terminals and poor traffic management may be responsible for the observed situation before the road project, which was aimed to ameliorate the adverse conditions in the project area. The results of the baseline studies on the environmental and socio-economic situation at the pre-construction of the road project reveal that environmental situations were generally poor.

Table 2: Pre-construction (baseline) environmental and socio-economic indices

Environmental indicators	Impacts' significance ratings (n=120)					SWV	RSI	MI	MD
	1	2	3	4	5				
Noise pollution	5	13	9	72	21	451	**3.76**		0.76
Water pollution	11	50	45	11	3	272	2.27		-0.73
Air pollution	8	16	28	45	23	419	**3.49**		0.49
Flooding	4	45	59	12	-	319	2.66		-0.34
Traffic congestion	10	5	16	61	28	452	**3.77**		0.77
Poor road condition	14	1	45	37	23	414	**3.45**		0.45
Poor road terminals	1	41	6	35	37	426	**3.55**		0.55
Encroachment on pedestrian facilities	44	13	7	39	17	332	2.77	3.00	-0.23
Frequent road accident	18	44	27	18	13	324	2.70		-0.30
Vehicular/Pedestrian conflict	19	11	55	18	17	363	**3.03**		0.03
Frequent change in land use	24	49	25	3	19	304	2.53		-0.47
Impaired urban aesthetics	35	43	6	14	22	305	2.54		-0.46
Poor sanitation	8	47	23	20	22	361	**3.01**		0.01
Hindered access to adjoining neighbourhoods	8	10	35	47	20	421	**3.51**		0.51
Impaired mobility	19	13	27	49	12	382	**3.18**		0.18
Socio-economic indices									
Crime/Insecurity	13	43	35	19	10	330	2.75		-0.25
Housing shortage	24	47	34	15	-		2.33		-0.67
Rental value	17	15	62	21	5	342	2.85		-0.15
Displacement of businesses	8	63	30	7	12	312	2.60		-0.40
Unstable Income source	40	29	29	15	7	280	2.33		-0.67
Unemployment	17	20	50	15	18	357	2.98	3.00	-0.02
Access to shopping	13	1	28	53	25	436	**3.63**		0.63
Access to health	6	10	25	58	21	438	**3.65**		0.65
Children's access to education	5	3	25	60	27	461	**3.84**		0.84
Access to recreation facilities	21	10	27	47	15	385	**3.21**		0.21
Disruption of power supply	21	53	33	8	5	283	2.36		-0.64
Disruption of water supply	16	68	31	5	-	265	2.21		-0.79
Total							80.96		

Source: Authors field survey, 2017

The results suggest that before the road project, the neighbourhood had always experienced adverse environmental conditions such as high levels of traffic congestion, noise pollution, poor road terminal, air pollution, poor condition of roads, vehicular/pedestrian conflict and poor sanitation. The unplanned land use, poorly organised terminals and poor traffic management may be responsible for the observed situation before the road project, which was aimed to ameliorate the adverse conditions in the project area. The results of the baseline studies on the environmental and socio-economic situation at the pre-construction of the road project reveal that environmental situations were generally poor.

5.2 Construction Phase Impacts

Table 3 captures the outcome of the analysis of environmental and socio-economic indices of the project area at the construction phase with a Mean Index of 3.14 which is relatively higher than the 3.00 obtained at the pre-construction phase. The table reveals that 15 (ten environmental and five socio-economic) of these variables have RSI higher than 3.0. and 13 of them have RSI higher than 3.14 (the Mean Index). In order of significance, the thirteen variables with RSI higher than the MI include noise pollution (4.36), traffic congestion (4.03), poor road condition (3.83), displacement of business (3.70), unemployment (3.69), change in land use (3.48), higher rental value (3.45), vehicular/pedestrian conflict (3.43), poor road terminal (3.41), unstable income (3.25), impaired urban aesthetics (3.24), air pollution (3.20) and water pollution (3.18).

Table 3 further revealed that the scale and mix of environmental and socio-economic indices observed at the construction phase are somehow different from the pre-construction phase results. For example, the RSI of 4.36 for noise pollution is far higher than the pre-construction phase, suggesting that the road project worsen the noise pollution in the project environment. Similarly, RSI of 4.03 for traffic congestion is also much higher than what obtains in the pre-construction phase. Besides, seven of the significant indices at this phase are not significant at the preconstruction phase, and these include water pollution, change in land use, impaired urban aesthetics, higher rental value, displacement of businesses, unstable income, and unemployment. This suggests that the road project has significant environmental and socio-economic impacts in the construction phase.

Table 3: Construction phase environmental and socio-economic indices

Environmental indicators	Impacts' significance ratings (n=120)					SWV	RSI	MI	MD
	1	2	3	4	5				
Noise pollution	-	4	11	43	62	523	**4.36**		1.22
Water pollution	4	22	53	31	10	381	**3.18**		0.04
Air pollution	7	9	58	45	1	384	**3.20**		0.06
Flooding	12	39	37	32	-	329	2.74		-0.40
Traffic congestion	15	6	2	34	63	484	**4.03**		0.89
Poor road condition	10	8	1	74	27	460	**3.83**		0.69
Poor road terminals	9	3	56	34	18	409	**3.41**		0.27
Encroachment on pedestrian facilities	32	49	13	15	11	284	2.37	3.14	-0.77
Frequent road accident	11	35	31	39	4	350	2.92		-0.22
Vehicular/Pedestrian conflict	10	15	35	34	26	411	**3.43**		0.29
Frequent change in land use	23	7	8	54	28	417	**3.48**		0.34
Impaired urban aesthetics	2	26	44	37	11	389	**3.24**		0.10
Poor sanitation	8	40	18	40	14	372	**3.10**		-0.04
Hindered access to adjoining neighbourhoods	18	31	30	22	19	353	2.94		-0.20
Impaired mobility	11	32	51	9	17	349	2.91		-0.23
Socio-economic indices									
Crime/Insecurity	16	26	31	44	3	352	2.93		-0.21
Housing shortage	24	42	34	20	-	290	2.42		-0.72
Rental value	-	33	10	67	10	414	**3.45**		0.31
Displacement of businesses	6	15	15	57	27	444	**3.70**		0.56
Unstable Income source	5	41	5	57	12	390	**3.25**		0.11
Unemployment	8	20	15	35	42	443	**3.69**	3.14	0.55
Access to shopping	21	35	42	10	12	317	2.64		-0.50
Access to health	12	36	43	10	19	348	2.90		-0.24
Children's access to education	10	29	43	16	22	371	**3.09**		-0.05
Access to recreation facilities	31	24	48	12	5	296	2.47		-0.67
Disruption of power supply	25	32	39	23	1	303	2.53		-0.61
Disruption of water supply	21	34	45	19	1	305	2.54		-0.60
Total							84.75		

Source: Authors field survey, 2017

Specifically, socio-economic impacts in the form of business displacement, unemployment (job loss), increased rental value and unstable income were noticeable. It is normal to have environmental and socio-economic impacts from road projects of this nature. Thus, the higher MI and RSI observed in this phase of the project are expected. However, the very high RSI of 4.36 and 4.03 for noise pollution and traffic congestion respectively suggest that adequate measures were not put in place to manage the very high adverse impacts. This is not strange as there was no clear evidence the assessment of the impact was done for the project.

5.3 Post-Construction Phase Impacts

The post-construction phase of the project is expected to produce more positive impacts in the study area. Analysis of the environmental and socio-economic indices for the post-construction phase as presented in Table 4 shows a mean index of 3.02 for the 27 variables which are relatively lower than the 3.14 obtained at the construction phase and very close to 3.00 obtained at the pre-construction phase.

Table 4 also reveals that 12 of the 27 variables have RSI higher than the mean index. The results show that the impacts observed at the post-construction phase are different from the construction phase. This is expected as the road project was initiated initially to mitigate some of the prevailing adverse environmental and socio-economic conditions before the project. However, some unanticipated adverse impacts were observed in the post-construction phase. An example is an encroachment on pedestrian facilities (sidewalks) which has the highest RSI (4.20). Other significant impacts in this phase include increased rental value (3.90), better access to health facilities (3.77) and education facilities (3.72), noise pollution (3.68), mobility (3.67), access to shopping (3.67), access to adjoining neighbourhoods (3.66), unemployment (3.50), air pollution (3.44), access to recreation facilities (3.38) and displacement of business (3.07).

For a better comparison of the construction and post-construction impacts with the baseline situation, the RSI of significant impact indicators in the three phases of the projects are presented in Table 5. The table reveals that 21 of the 27 impact indicators are significant across the three phases of the project. For instance, 13 of them were significant in the pre-construction phase, 15 in the construction phase and 12 in the post-construction phase. The results in the tables show that noise pollution was significant in the study area before the project; it became the most significant impact in the construction phase and had the least RSI in the post-construction phase.

Table 4: Post-construction environmental and socio-economic indices

Environmental indicators	Impacts' significance ratings (n=120)					SWV	RSI	MI	MD
	1	2	3	4	5				
Noise pollution	-	38	57	64	18	441	**3.68**		0.66
Water pollution	17	37	37	24	5	323	2.69		-0.33
Air pollution	5	16	28	63	8	413	**3.44**		0.42
Flooding	23	51	40	6	-	269	2.24		-0.78
Traffic congestion	26	32	18	36	8	328	2.73		-0.29
Poor road condition	32	36	48	3	1	265	2.21		-0.81
Poor road terminals	36	71	7	2	4	227	1.89		-1.13
Encroachment on pedestrian facilities	1	6	10	54	49	504	**4.20**	3.02	1.18
Frequent road accident	28	64	25	2	1	244	2.03		-0.99
Vehicular/Pedestrian conflict	24	12	75	7	2	311	2.59		-0.43
Frequent change in land use	5	42	36	24	13	358	2.98		-0.04
Impaired urban aesthetics	18	26	42	16	18	350	2.92		-0.10
Poor sanitation	23	65	15	10	7	273	2.28		-0.74
Hindered access to adjoining neighbourhoods	-	14	49	21	36	439	**3.66**		0.64
Impaired mobility	9	4	26	60	21	440	**3.67**		0.65
Socio-economic indices									
Crime/Insecurity	24	47	28	15	6	292	2.43		-0.59
Housing shortage	10	50	47	-	13	316	2.63		-0.39
Rental value	-	16	29	26	49	468	**3.90**		0.88
Displacement of businesses	3	33	52	17	15	368	**3.07**		0.05
Unstable Income source	14	25	58	20	3	333	2.78		-0.24
Unemployment	2	27	37	17	37	420	**3.50**	3.02	0.48
Access to shopping	5	12	33	38	32	440	**3.67**		0.65
Access to health	3	6	40	38	33	452	**3.77**		0.75
Children's access to education	1	5	51	33	30	446	**3.72**		0.70
Access to recreation facilities	9	8	59	17	27	405	**3.38**		0.36
Disruption of power supply	13	33	59	15	-	316	2.63		-0.39
Disruption of water supply	11	32	49	27	1	335	2.79		-0.23
Total							81.48		

Source: Authors field survey, 2017

Table 5: RSI of impact indicators in the three project phases

Impact indicators	Project phases		
	Pre-construction (RSI)	Construction (RSI)	Post-construction (RSI)
Noise pollution	3.76	**4.36**	**3.68**
Water pollution	2.27	**3.18**	2.69
Air pollution	3.49	**3.20**	**3.44**
Traffic congestion	3.77	**4.03**	2.73
Poor road condition	3.45	**3.83**	2.21
Poor road terminals	3.55	**3.41**	1.89
Encroachment on pedestrian facilities	2.77	2.37	**4.20**
Vehicular/Pedestrian conflict	3.03	**3.43**	2.59
Frequent change in land use	2.53	**3.48**	2.98
Impaired urban aesthetics	2.54	**3.24**	2.92
Poor sanitation	3.01	3.10	2.28
Hindered access to adjoining neighbourhoods	3.51	2.94	**3.66**
Impaired mobility	3.18	2.91	**3.67**
Rental value	2.85	**3.45**	**3.90**
Displacement of businesses	2.60	**3.70**	**3.07**
Unstable income source	2.33	**3.25**	2.78
Unemployment	2.98	**3.69**	**3.50**
Access to shopping	3.63	2.64	**3.67**
Access to health	3.65	2.90	**3.77**
Children's access to education	3.84	3.09	**3.72**
Access to recreation facilities	3.21	2.47	**3.38**
Mean Index	3.00	3.14	3.02

Source: Authors Analysis

5.4 Assessment of Mitigating Measures

This section appraises the various mitigating measures adopted to manage the adverse impacts of the road upgrade. Of the 27 listed impacts, 20 of them were considered significant in both construction and post-construction phases. However, respondents' assessment of the mitigating measures presented in Table 6 indicates that only 15 of these impacts had visible mitigating measures. Results presented in the table indicate that 11 of the 15 mitigating measures were effective. The percentage of respondents who regarded these measures as an effective range from 61% to 99%. Consequently, the mitigating measures deployed to manage hindered access to adjoining neighbourhoods was regarded as the most effective (99%). The measures deployed against this impact include diversion of traffic and use of mass media to inform the residents of the host community about the traffic management measures.

Table 6: Respondents' assessment of the mitigating measures

Project impact	Mitigating measure	Effectiveness (% of respondents)	
		Effective	Ineffective
Impaired access to adjoining neighbourhoods	Diversion of traffic and mass media announcement to that effect	99.0	1.0
Poor road condition	Quality road construction and use of quality materials	98.0	2.0
Poor road terminals	the proper definition of terminals, delineation of boundaries, lighting, layout and toilet provision	92.0	8.0
Traffic congestion	Traffic diversion and use of traffic officials	90.0	10.0
Misuse of pedestrian facilities	Barricading and preventing commuters from crossing the highway	86.0	14.0
Impaired urban aesthetics	Urban design application to the construction of the pedestrian bridge, terminals and roads	80.0	20.0
Road accident	Placement of safety/traffic signs; deployment of traffic and road safety personnel	77.0	23.0
Vehicular/pedestrian conflict	Construction of sidewalks/erection of barricade to prevent commuters from crossing highway	75.0	25.0
Crime/insecurity	Deployment of the police and other security agencies	68.0	32.0
Poor sanitation	Constant site cleaning	63.0	37.0
Noise pollution	Avoidance of use of noise-making equipment/ elimination of unnecessary public audios.	61.0	39.0
Air pollution	Regular road wetting	45.0	55.0
Flooding	Construction of proper drainage channels	43.0	57.0
Displacement of business	Compensation	37.0	63.0
Change in land use	Compensation/consultation with stakeholders	37.0	63.0

Source: Authors field survey, 2017

Other adverse impacts whose mitigating measures were considered adequate include poor road condition, poor road terminals, traffic congestion, misuse of pedestrian facilities, impaired urban aesthetics, road accident, vehicular/pedestrian conflict, crime/insecurity, poor sanitation and noise pollution. Interestingly, noise pollution rated as the worst impact in the construction phase is the least (61%) among the impacts with effective mitigating measures. The primary measure deployed to mitigate this impact was the avoidance of the use of noise-making equipment. The other four impacts whose mitigating measures were considered ineffective include air pollution, flooding, displacement of businesses and change in land use. Displacement of businesses and change in land use were considered as impacts with the most ineffective mitigating measures. This suggests that compensation of and engagement with owners of affected businesses were not well-managed. Impacts of the project without any visible mitigating measure in both construction and post-construction phase include unemployment, higher rental value, unstable income, water pollution and encroachment on sidewalks. The lack of measures to mitigate these impacts exclude them from those listed in Table 6.

6. Discussion of Findings

The assessment of the environmental and social impacts of road upgrade in the project area, as documented in this study produces some outcomes that are not usually found in the literature. For instance, the magnitude of the road project reviewed in this study requires that a proper impact assessment is done before the project execution phase. However, there was no evidence that relevant government agencies did such a study. Consequently, the findings in this study may be a true reflection of the absence of an impact assessment study on the project.

This study established that the prevailing environmental and socio-economic conditions of the project area before the road improvement were poor. This is attributed to weak planning control and poor integration of land use and transport planning, thus necessitating the road improvement project which includes the construction of a 3-legged pedestrian bridge and walkways for vehicular/pedestrian segregation, roadway improvement in the form of the slip road, rotary junction, road widening, creation of three parking areas, relocation of market, road signs, speed control, traffic signal, safety and

security measures and control of environmental nuisances in the project area. Soneye (2010), in his study of the environmental impacts of the upgrade of another major highway in Lagos metropolis also supported the claim that these areas are usually subjected to various transportation challenges that often lead to public outcry. The roads upgrading and provision projects are the responses of government to the outcries of the residents of these areas. The perceived environmental and socio-economic situations during and after the project compared with the baseline situation showed that the project produced some adverse impacts, the most prominent being noise pollution at the construction phase. This is not at variance with what obtains in literature, and there are practical ways of dealing with such impact. For instance, Towers (2001) argued that identifying the noise problems at the design phases of the project is the most important thing to do so that appropriate mitigating measures can be specified proactively, before the start of the construction. Similarly, Wanjiku (2014) also posited that adverse impacts associated with the construction of highways are predominantly environmental impacts such as pollution and the loss of biodiversity within the environment.

The social and economic impacts of road projects are also positive and beneficial to the host communities. This study presents that some of the benefits of the project on the host community are, the enhance physical environment, improved security, increased accessibility and mobility, increase in land value, improved standard of living of residents and the provision of employment opportunities. These are some of the beneficial environmental, social and economic impacts of road projects. Bogale (2016) in his study of the impacts of three major highways in Ethiopia also discovered that there are more positive and less negative temporal and spatial socio-economic impacts generated by the three corridors notwithstanding their locational disparities.

In the absence of evidence of an existing impact assessment report, this study established that the road improvement project has helped to deal with the hitherto poor transport and land use challenges in the project area. The study also established that the mitigating measures deployed to manage the adverse impacts of the project were generally effective, but ineffective for impacts such as air pollution, flooding, displacement of businesses and change in land use. Where impacts of road development are not properly predicted and analysed, some of the mitigating measures adopted in addressing the environmental and social impacts of roads and other developments are little more than window-dressing (Alamgir et al., 2017).

7. Conclusion

The provision and expansion of roads have been on the rise in most Nigerian cities in recent times. These road projects have transformative effects on the environment, economies and societies which should be discussed and considered publicly. This study has examined the Ojodu-Berger road expansion projects in Lagos and identified the various social and environmental impacts associated with this project. The relevance of this study lies in its potential to provide valuable information that can serve as a guide to adopting best practices in the delivery of road projects in urban areas. The study concludes that where no impact study is done for road development or improvement in urban areas, the use of local perception remains an excellent approach to appraising project impacts. Based on the findings in this study, it is recommended that in the future, government agencies responsible for urban road development should follow best practices in project impact assessment before construction. This should involve adequate community consultation and engagement of people in the host community as a way of achieving sustainable project development in the road transport sector. This aligns with the position of Chen (2001) who submitted that the effects of subway construction on host communities in China were expertly managed by predicting and analyzing the social risks and potential social conflicts in advance. It is clear from this study that some adverse impacts of the road upgrade could not be adequately mitigated as some of them were beyond the scope of government intervention. Such impacts include unemployment/job loss, higher rental value and income instability. In the future, such impacts should be anticipated, predicted and managed adequately for social and political equity.

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Consultants` Perspectives of Survival Strategies for Small and Medium Construction Firms at Infancy Stage

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Abstract

This study examines survival strategies for Small and Medium Construction Firms (SMCFs) at infancy stage as well as the factors affecting the adoption of these strategies. The study area is Uyo Metropolis in Akwa Ibom State, Nigeria. The study employed stratified random sampling technique to select a sample for the study. Primary data obtained from 103 validated questionnaires, administered to professionals in the built environment are analysed using percentage, mean score and Kruskal Wallis test. Results reveal that all the strategies examined in this study are significant for the survival of SMCFs at infancy stage; dominant among the factors are: innovativeness, required skills, willingness to take risk, entrepreneurial attitudes and behaviours, entrepreneurial organization structure and strategies, and financial resource management. The results further reveal that the dominant factors affecting the adoption of survival strategies for SMCFs at infancy stage are: availability and access to finance, the poor state of the country's infrastructure, poor managerial/executive capacity of the implementing agencies, characteristics of entrepreneurs and failure to adapt to the changing business environment. The study recommends that in addition to regular training to acquire required skills for effective management of the firms, SMCFs should also adopt any or a combination of the strategies highlighted, to survive in the current dynamic and competitive construction environment.

Keywords: Construction Firms, Construction Industry, Entrepreneurship, Stakeholders, Strategies.

1. Introduction

In a bid to address the issue of unemployment, government efforts have focused mainly on implementing one initiative or the other. This may not be unconnected to the notion that the solution to unemployment can only be achieved when people take to entrepreneurial activities (Okezie, Alex, & Asoluka, 2013). This could also be attributed to the fact that small and medium-sized enterprises (SMEs) cover a wide range of industries and play an important role in both developed and developing economies (Sharma & Bhagwat, 2006). Also, a booming and blooming SME`s sector is viewed as one of the significant characteristics of a flourishing and growing economy that every government intends to attain (Etim, Adabu, & Ogar, 2017). Ongori and Migiro (2010) assert that in Africa, SMEs employ more than 40% of all new entrants to the labour force because they are labour intensive.

Similarly, Sharma and Bhagwat (2006) assert that the SMEs sector accounts for 40 per cent of industrial production, 35 per cent of total 20 exports and provides about 80 per cent of employment in industrial production in India. The economic development of most nations such as Malaysia, Singapore, Hong Kong, South Korea and Taiwan is intrinsically linked to the development of the SME sector. Study shows that by the end of 2012, 80% of China's employment and 60% of the country's GDP had been provided by the 13 million SMEs that constitute more than 99% of all the country's enterprises (Gao & Banerji, 2015). In Nigeria, the contribution of SMEs to the economy is of notable significance as 70% of the country's employment is generated by SMEs (Aina, 2007).

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Entrepreneurship has permeated every industry and arguably every career of choice (Allen, 2003), the way people think, reason and act are opportunity-based, holistic in approach and leadership balanced (Timmons & Spinelli, 2004). As part of initiatives to address the issue of unemployment, the communiqué of the World Conference on Higher Education held in Spain implored tertiary institutions to produce entrepreneurship graduates towards a sustainable economy (Udoudoh, 2018). Many countries have also included entrepreneurship training at secondary schools and higher education institutions since the 1990s (Duell, 2011). As part of the effort, the Nigeria government in 2006 gave a directive through the Higher Education Institutions (HEIs) to immediately include Entrepreneurship Education (EEd) as a compulsory course for all students with effect from the 2007/2008 academic session (Etuk, Offiong, & Usip, 2018). Despite the numerous laudable programmes, policies, schemes and financial investment by the government of different nations, many SMEs fail to grow beyond the infancy stage. The situation in Nigeria is not much different as entrepreneurial development is still very slow, and many SMEs find it difficult to survive the turbulence in the market economy (Diyoke, 2014). The situation in the construction industry is worrisome. This is because the industry is more susceptible to high failure compared to SMEs in other sectors, such as manufacturing and agriculture. Odeyinka, Kaka and Mortledge (2003) had earlier reported a high rate of failure in the construction industry compared to other sectors of the economy. The impact of the failure is endemic and disruptive to the construction industry, individuals and the society at large (Scarborough, Zimmere, & Wilson, 2008; Abd-Hamid et al., 2015). The construction business is limited to 80% in many construction companies in what is believed as a lack of business opportunities and the recent world economic decline (Adesiyan, 2016).

Several programmes and initiatives in resuscitating SMEs, particularly in developing countries, have no clear directive of survival strategy for entrepreneurship at the infancy stage. The infancy stage of entrepreneurship is a phase before the maturity stage in the business lifecycle, which is about a maximum of six to seven years from the commencement of the business. Most entrepreneurs at this stage are immature and inconsistent with the needs of a business-driven system. Ndabeni (2008) states that many new ventures fail and only a few attain survival and sustainability rating in both developed and developing countries. Turyakira (2018) reports a continuous business failure of small and medium-sized enterprises in developing countries. Research findings in Nigeria reveal that most SMEs collapse within their first five years of existence (Aremu & Adeyemi, 2011). The authors add that a smaller percentage goes into extinction between the sixth and tenth years, while only about five to ten per cent of young companies survive and grow to maturity. In corroboration, Ajayi, Peace and Mafimidiwo (2015) confirm a high mortality rate of business organisations in Nigeria (including the construction industry) due to poor performance. The situation is not much different in other countries (Thwala & Phaladi, 2009; Adcorp, 2012). This may not be unconnected to the fact that today's business environment characterised by more volatility and uncertainty than ever before, with globalization being the order of the day has become a reality for all players on the domestic and international scene (Naicker & Saungweme, 2009). Collett, Pandit and Saarikko (2014) identify poor management, high debt in the adverse macroeconomic and microeconomic environment as three critical factors responsible for the failure of SMEs. In a similar study, Santini, Favarin, Nogueira, Oliveira and Ruppentthal (2015) identify eleven major factors causing mortality of small businesses and classified them into two. The first group is the internal and external factors, and the second group of factors are related to the owner-manager, to the business itself and the environment.

Previous studies have attempted to address this problem and also to suggest possible solutions in some developing countries (Adejumo & Olaoye, 2012; Okezie et al., 2013; Diyoke, 2014; Bouazza, Ardjouman & Abada, 2015; Abd-Hamid et al., 2015; Igwe, Newbery, White & Nihar, 2017; Jegede, 2018), yet there is a dearth of research on strategies for survival of SMEs at infancy stage particularly in the construction sector. This may be because researchers have not recognized the vacuum created by the dead and ailing firms rendering investigation of strategies for its survival crucial. In order to investigate the subject and contribute to narrowing the knowledge gap, this study provides insight to the survival strategies at the infancy stage of construction entrepreneur with the view to ensuring sustainable entrepreneurship in the built environment. The objectives of the study are to examine the survival strategies at infancy stage for SMCFs and to assess further the extent of the factors that affect the adoption of these strategies from consultants` perspectives in Uyo Metropolis of Nigeria. The result of this study should provide useful information for construction entrepreneurs on survival strategies to be adopted, especially at the infancy stage and also ensure smooth take-off for potential entrepreneurs. The proposed strategies will not only ensure the survival of SMCFs but will also promote the globalization of SMEs, improve economic status and reduction in poverty level.

2. Entrepreneurship and SMCFs

Entrepreneurship has become a global topic, and yet it has no universally accepted definition (Dana, 2001). Baron and Henry (2011) attempt to describe entrepreneurship as a field that seeks to understand how opportunities to create something new (such as products or services) arise, and are created by individuals who then use various means (for instance launching a new business) to exploit or develop them. Oladun (2012) views entrepreneurship as creating a product, a service, task or activity that meets the needs of the society with its attendant financial rewards and risks. Similarly, Nwoke, Adebayo and Olutope (2017) define entrepreneurship as the process which involves the effort of an individual or individuals in identifying viable business opportunities in an environment and managing the resources needed to exploit them. Entrepreneurship is, therefore, a medium that intends to meet the needs of ordinary citizens and the nation by creating a product or service of values. Most governments, especially in the developing countries in an attempt to strengthen their socio-economic development,

have redirected their focus on entrepreneurship and formation of new firms and industries (Rattanawiboonsom & Ali, 2016). According to Bondinuba (2012), small firms are classified as having between 10 and 99 employees, while medium firms have between 100 and 200 employees. This classification defines SMCFs, which is an extension of SMEs in the construction sector.

The construction industry plays a complementary role in entrepreneurship in both developed and developing countries. Studies reveal that the construction industry is a key provider of employment opportunities worldwide perhaps second to agriculture. It is the primary provider in urban areas, especially in the building sector involving both new and maintenance work which is labour intensive (Women in Informal Employment: Globalising and Organising (WIEGO, 2018). The industry is identified as one of the leading economic indicators in terms of building permits that offers foresight into future real estate supply levels of which a high volume indicates a vibrant construction industry with an attendant increase in GDP (Smith, 2018). The construction industry aids the development of entrepreneurship by creating an enabling environment through the provision of physical infrastructures, such as transportation, access to power, water and raw materials. Without these facilities, entrepreneurship activities will suffer serious consequences such as an increase in production cost and associated risks which impact economic growth and development. Efforts toward these provisions enhance the relevance of the industry in wealth creation and job opportunities which make the industry one of the best sectors positively complementing government efforts in meeting the needs of the citizenry. In order to sustain these laudable achievements, construction entrepreneurs need to capture economic value through the exploration and exploitation of construction businesses (Abd-Hamid et al., 2015), both at local and national levels. This is made possible because of the multi-disciplinary approach of the industry which involves different trades, professionals, skilled and unskilled personnel producing value chain through interdependency in providing necessary inputs at different phases of the project from inception to completion (Akinsiku & Olubunmi, 2014). This is a good platform for entrepreneurs to thrive, especially among young built environment graduates (Adu & Oladele, 2018). These include contracting and subcontracting works such as aluminium works, professional glaziers, finishing works, material manufacturing as well as labour and skills management on site. All these can be accommodated in the built environment (Dada, 2017) apart from the core management services required at different project lifecycle.

3. Survival and Survival Strategy for SMCFs

Survival is one of the primary ways of measuring business success apart from other factors such as profits, return on investment, sales growth, and the number of personnel employed, happiness and corporate reputation (Schmidpeter & Weidinger, 2014). A considerable number of studies in the entrepreneurship field view the concept of survival as similar to success (Praag, 2003; Reijonen & Komppula, 2007). Reijonen and Komppula (2007) find a similarity between survival and success and define survival as continued business operations, and failure as going out of business. Praag (2003) posits that the longer a business can survive in the market place and prevent involuntary exit, the more successful it is. Survival is therefore fundamental to the success of entrepreneurship provided a right strategy is employed. Strategies are well-planned series of actions, ways and means of making use of available human and non-human resources intelligently and skilfully to achieve a goal. According to Yusuf and Dansu (2013), the concept of strategies is built on the future ability of a business to operate ethically and contribute to economic development while improving the quality of life for its workforce, the local and global community and future generations. Strategies are an integral part of every endeavour and are fundamental to the formation, survival and successful growth of entrepreneurship in today`s competitive business environment. The formulation and implementation of these strategies might hold the key to the growth and survival of SMEs. An understanding of sources, causes and nature of the failure of SMEs is a significant determinant of the choice of strategy to adopt for organisation survival. Investigation of causes of factors responsible for premature death or failure of SMEs has received much research attention. Failure of SMEs is attributed to several factors which include unethical practices, lack of information, economic recession, soliciting or offering kickbacks, incompetence, poor infrastructure, lack of quality education, ineffective credit and financial system, corruption and political instability (Tarus & Nganga, 2013; Ononogbo, Joel, & Edeja, 2016; African Economic Outlook, 2017; Igwe, Newbery, White, & Nihar, 2017). Similarly, Agwu and Emeti (2014) identified other factors contributing to this premature death of SMEs such as insufficient capital, irregular power supply, infrastructural inadequacies, lack of focus, inadequate market research, lack of succession plan, inexperience and lack of proper bookkeeping, inability to separate business and personal finances.

Etim et al. (2017) in a study on the influence of entrepreneurial orientation as a survival strategy for SMEs in Nigeria, affirm that there is a significant positive relationship between the survival of SME's and entrepreneurial orientation variables which include innovation, risk-taking and pro-activeness. Fadanhusi (2012), in a similar study on the growth of small businesses, reveals a positive correlation between survival strategies via innovativeness and the survival of SMEs. Okpara (2009), also, observes that SMEs that are driven by innovation have a higher survival rate than those with a conservative attitude. Abd-Hamid et al. (2015) in a study on predictors for the success and survival of entrepreneurs in the construction industry find that the success and survival of construction enterprises depend on success factors which have a direct impact on the business success, not only in the short-term but also, the long-term. Ali (2018), in a recent case study on one of the most successful entrepreneurs in the water industry in Basra city, shows that five strategies are used by the founder to keep his firm alive. These include a sale on credit (buy now and pay later), groundwater to produce freshwater for

low cost, care for wholesale and retail dealers and quality products, technology investment for cost reduction, and social network and family support. Factors such as entrepreneurial attitudes and behaviours have been identified as necessary for firms of all sizes to prosper and grow (Kraus, 2013). Man et al. (2002) also identify entrepreneurial competency as important in a firm's performance and competitiveness. Competitiveness, conversely, has a variety of attributes such as personality traits, skills and knowledge that enhance survival of entrepreneurs. Traditional factors such as age and size of the firm, organizational strategies; individual and environmental factors are also found to have an impact on the survival of SMEs (Geroski, Mata, & Portugal, 2010). Other factors such as ambition, independence, self-confidence, risk-taking, vision, creativity, energy, passion, and commitment are vital traits expected of successful entrepreneurs (Hisrich, Shepherd, & Peters, 2005; Ogbo & Agu, 2012). In addition to the above review, which provides insight into the survival strategies for entrepreneurship, comprehensive literature identifies 18 variable factors as presented in Table 1. The concern of this study, however, is to examine the variables that constitute survival strategies for SMCFs at the infancy stage.

Table 1: Survival Strategies for Construction Entrepreneurship

S/n.	Factors	Sources
1	Entrepreneurial organization structure and strategies	Chen and Lee, 2007
2	Competitive aggressiveness	Venkatraman, 1989
3	Entrepreneurial attitudes and behaviours	Kraus, 2013; Morris et al., 1996
4	Required skills	Osemeke, 2012; Ogbo and Agu, 2012
5	Autonomy	Lumpkin and Dess, 1996
6	Organizational flexibility and speed	Morris et al., 2012
7	Financial resources and management	Wiklund et al., 2009
8	Adaptability	Morris and Kuratko, 2003
9	Entrepreneurial competencies	Ma et al., 2002
10	Corporate venturing	Antoncic and Hisrich, 2001
11	Willingness to take risk	Rauch et al., 2009
12	Environmental factors	Geroski et al., 2010
13	Proactiveness	Rauch et al., 2009
14	Innovativeness	Rauch et al., 2009
15	Human resource management	Anyadike et al., 2012
16	Social network	Mboko and Smith-Hunter, 2009
17	Family support	Mboko and Smith-Hunter, 2009
18	situational responsiveness	Mboko and Smith-Hunter, 2009

4. Factors Affecting the Adoption of Survival Strategies for SMCFs

Identifying survival strategies for sustainable entrepreneurship is not sufficient in helping entrepreneurs to achieve the desired result. Entrepreneurs need to understand the nature and dynamics of challenges and difficulties inherent to the implementation of these strategies. This is because entrepreneurs operate in a competitive environment coupled with constraining internal organizational factors which determine the success or failure of any adopted strategy or initiative. However, these factors are inherent in every business, small or large; understanding and the priority accorded to these factors are important to the adoption of the survival strategies for entrepreneurs. Adopting a strategy for the survival of entrepreneurship is therefore critical to its continued existence and success even beyond the infancy stage. Previous studies reveal that failure of several programmes and many support initiatives to revamp entrepreneurship by past and current governments of Nigeria was blamed on poor implementation (Okezie et al., 2013; Adejumo and Olaoye, 2012).

Similarly, Etim et al. (2017) also blamed this on the initial response of the policymakers in Nigeria as either not proactive or reactive enough to respond to the alarming rate of the depth of problems faced by SME`s or understand the magnitude of the difficult conditions faced by owners of SME`s. Igwe et al. (2017) identify five major institutional barriers which also affect the adoption of survival strategies in Nigeria as follows: an ineffective credit and financial system, corruption, political instability and an inefficient legal system, poor infrastructure, lack of quality education, and religion, traditions and customs. Entrepreneurship operates within environmental factors such as economic, political, financial, technological and legal positions of an organization (Taormina & Lao, 2006). Inability to assess effective management poses a threat to its success and survival. Besides, Igwe, Amaugo, Ogundana, Egere and Anigbo (2018) identify insecurity, bribery, bureaucratic delays, power outage and lack of market access among the existing challenges of entrepreneurship.

Infrastructure deficit in most developing countries has retarded efforts of entrepreneurs in the adoption of rewarding initiatives for its survival in the market place. Onodugo and Onodugo (2015) raise a serious concern on the state of Nigeria’s infrastructure and view it as a nightmare to both entrepreneurs and the rest of the country's population. The authors add that with the existing infrastructure or non-existence in some places; the cost of doing business has risen tremendously. The relocation of some multinational organizations from Nigeria to Ghana a few years ago was not unconnected with the poor state of infrastructure. Several other factors that could hinder entrepreneurs in adopting recommended

strategies have been identified in the literature. These include lack of access to external financing, low human resources, characteristics of entrepreneurs, managerial capacities, location of the enterprise, access to information, inadequate business planning, technological capacities, access to finance, human resources capacities, corruption, lack of motivation, and education background of the entrepreneur (Haynes, 2003; Ciavarella et al., 2004; Dionco-Adetayo, 2004; Ucbasaran, Westhead, & Wright, 2004; Morse, Fowler & Lawrence, 2007; Krasniqi, 2007; Pasanan, 2007; Sridhar & Wan, 2010; Sidika, 2012; Onodugo & Onodugo, 2015; Bouazza Ardjouman & Abada, 2015). The summary of literary works on 31 variable factors affecting the adoption of survival strategies for SMCFs is as presented in Table 2.

Table 2: Factors affecting adoption of survival strategies for entrepreneurship

S/n.	Factors	Sources
1	Lack of management skills and training	Bouazza et al., 2015
2	Characteristics of entrepreneurs	Ciavarella et al., 2004
3	Managerial capacities	Olawale and Garwe, 2010
4	Lack of resources for implementation	Ofori, 1994
5	Contractor's incompetence/inadequacies	Ogunlana et al., 1996
6	Human resource capacities	Lee, 2001
7	Lack of commitment to solve its problems	Ofori, 1994
8	Technological capacities	Drucker, 1985; Morse et al., 2007
9	The poor state of the country's infrastructure	Ogunlana et al., 1996; Onodugo and Onodugo, 2015
10	Access to finance	Krasniqi, 2007
11	The poor executive capacity of the implementing agencies	Ofori, 1994
12	Low technological capacities	Morse et al., 2007; Bouazza et al., 2015
13	Corruption	Onodugo and Onodugo, 2015
14	In-appropriateness of some of the recommendations	Ofori, 1994
15	Inconsistent government policies	Onodugo and Onodugo, 2015
16	Problems caused by clients and consultants	Ogunlana et al., 1996
17	Failure to adapt to the changing business environment	Onodugo and Onodugo, 2015
18	Lack of motivation factors	Dionco-Adetayo, 2004
19	Lack of support from expected quarters	Rahman and Singh, 2014
20	Location of the enterprise	Sridhar and Wan, 2010; Leidholm, 2002
21	Education background	Almus, 2002; Martinez et al., 2007
22	Access to information	Okumus, 2000
23	Inadequate business planning	Ahmad and Seet, 2009
24	Networking	Ciavarella et al., 2004
25	Problems caused stakeholders	Ogunlana et al., 1996
26	Cumbersome legal and regulatory constraints	Bouazza et al., 2015
27	Resource allocation	Okumus, 2000
28	Operational plans	Okumus, 2000
29	Control mechanism	Thorpe and Morgan, 2007
30	Cooperative management	Thorpe and Morgan, 2007
31	Organisational behaviour or culture	Okumus, 2000

5. Methodology

The study utilises primary data obtained through a field survey in order to achieve the objectives. The study area is Uyo, the capital of Akwa Ibom State, the leading oil-producing state in the Niger Delta. Uyo is also one of the fastest-growing state capitals in terms of infrastructure and development within the South-South region of Nigeria (Olubajo & Kuma, 2017). The choice of the area was to explore the possibility of reducing the mortality rate among SMCFs and reviving ailing ones majorly at the infancy stage. This is with the view to ensuring their contributions to the "industrialization" agenda of the government as well as sustaining the contributions of these firms to both the local and national economy. The purpose of the industrialization agenda is to rebrand Akwa Ibom State from "civil service" state to industrialize base of Nigeria. The study population consists of professionals in the construction industry.

Since professionals in the SMCFs within Uyo metropolis are used in this study, the stratified random sampling technique is employed to determine the sample of the study. The technique is important as it further enhances the sampling precision of the study population (Kumar, 2005). The stratification was done according to the respective professional bodies. The professionals include Architects, Builders, Engineers, Estate Surveyors and Quantity Surveyors. Before the distribution of the questionnaire, a pre-test to evaluate the proper understanding of the questions and to ascertain whether the questionnaire items adequately cover the constructs and objectives of the study was undertaken. The questionnaire was moderated by five research experts in the field of entrepreneurship and the built environment. The pilot study is considered necessary to ascertain the reliability of the questionnaire when used in the population of the study. This process assists in eliminating any potential problems of the research instrument and in

testing the validity and workability of the instrument. Inputs are collated, which result in 15 variable strategic factors for the survival of entrepreneurship and 23 variable factors affecting the adoption of the strategy were adopted in the production of the final questionnaire used in this study. The reliability was also tested and found to be high with Cronbach α of 0.67 and 0.82 of variable factors for survival strategies and factors affecting the adoption of the strategies, respectively. Thus, it is deemed acceptable, since the value of alpha is desirable with the range higher than 0.6 (Hair, Anderson, Tatham & Black, 2006). The reliability as a quality criterion helps to minimize errors and give stable results of data collection.

The sample frame of 272 was obtained from the directories of registered professionals from their respective chapters in the state. This comprises of the Nigerian Institute of Architects (NIA), Nigerian Institute of Builders (NIB), Nigerian Institute of Engineers (NSE), Nigerian Institute of Estate Surveyors and Valuers (NIESV) and the Nigerian Institute of Quantity Surveyors (NIQS). The sample size of the study is determined using Taro Yamane formula for finite populations (Olusanya, 2018), which states that

$$n = \frac{N}{1 + N(e^2)} \quad (1)$$

Where n is the sample size, N is the finite population, e is the level of significance (0.05), and 1 is unity.

The breakdown of the sample frame and sample size for each category is shown in Table 3. Thus, a sample size of 235 is adopted for the study. The minimum qualification of the respondents is Higher National Diploma (HND) which is also minimum qualification for corporate membership of professional bodies in the Nigerian built environment; 83 per cent have over five years of professional work experience in the industry.

Table 3: Sample Frame and Sample Size of the Study

Professional	Sample frame	Sample size
Architects	63	54
Builders	22	21
Engineers	93	76
Estate Surveyors	55	48
Quantity Surveyors	39	36
Total	272	235

Section (A) of the questionnaire solicits data on the demographic characteristics of respondents. The aim is to establish a relationship between responses and organisational characteristics of the respondents. Section (B) uses a 5-point Likert scale ranging from 1 (no importance) to 5 (very high importance) to establish the level of importance of survival strategies for SMCFs based on the perception of respondents. The study subsequently seeks the perception of respondents on the severity of factors affecting the adoption of the survival strategies for SMCFs using a five-point Likert scale ranging from 1 (no effect) to 5 (very high effect). The questionnaires were self-administered, and one hundred and nine questionnaires were returned in which six feedbacks were identified as invalid due to incomplete information. One hundred and three valid questionnaires were used for the analysis giving a valid response rate of 44%. The percentage is higher than the 20-30% returned rate for research conducted within the construction industry. Therefore, the result of the survey cannot be considered as biased or of little significance (Moses & Stahelski, 1999; Akintoye & Fitzerald, 2002). The collected data were checked for completeness and consistency before data processing and analysis. The views of respondents were compared to determine whether or not they differ in their perception of factors constituting survival strategies and factors affecting the adoption of the strategies. This leads to the postulation of two hypotheses:

H_{o1}: There is no significant variation in the survival strategies for SMCFs among the perceptions of the various professionals; and

H_{o2}: There is no significant variation in the effect of the factors affecting the adoption of the strategy for SMCFs among the perceptions of the various professionals.

The two hypotheses of the study are analysed using Kruskal Wallis tests. Mean Score (MS) is used to determine the level of significance of each factor by five expressions defined by the intervals 0.8 with 3.4 as a cut-off for high significance based on Kazaz, Manisali and Ulubeyli (2008). The ranking of the factors is determined based on the mean item score of each item calculated by the following equation:

$$MS = \frac{\sum(RP_i \times R_i)}{n} \quad (2)$$

Where: MS = Mean Score, RPi= Rating point i (range from 1-5), Ri= response to rating point, i) and n = total responses = summation of Ri from1-5

6. Results and Discussion of Findings

Results arising from the analyses of the data collected for the study are presented below. This includes the test of the two hypotheses; evaluation of the survival strategies for SMCFs; and the relative effect of the factors affecting adoption of the strategies for SMCFs.

6.1 Tests for the two hypotheses of the study

The study tests whether or not there is significant variation in the perception of various professionals of the survival strategies for SMCFs and the effect of the factors affecting the adoption of the strategies. This became necessary to ascertain the level of importance of the survival strategies for SMCFs and variance of the factors militating against the adoption of the strategies among the SMCFs or whether it could be generalized. This is achieved using a Kruskal-Wallis test. Kruskal-Wallis Test (H) is a non-parametric statistic which is an alternative to the one-way analysis of variance test (Pallant, 2007; Udofia, 2011). This test is used when the assumptions for the parametric statistic cannot be satisfied or are violated (Pallant, 2007). One of the assumptions of the parametric techniques is that the level(s) of measurement of the variable(s) should be an interval or ratio scale otherwise the non-parametric alternative is to be considered (Pallant, 2007). These criteria are satisfied by the data used for this study, hence

the choice of the Kruskal-Wallis (H) Test. The rule for rejection or non-rejection of the hypothesis is that if p-value > 0.05, the hypothesis is accepted, but if p-value ≤ 0.05, the hypothesis is rejected. The results are presented in Table 4 and Table 5.

Table 4: Kruskal-Wallis H-Test for variation in of the importance of survival strategies for construction entrepreneurship in Uyo Metropolis of Nigeria

Parameters Tested	Respondent groups	N	x^2cal	x^2tab	P-Value	Decision
The relative importance of survival strategies	Architects	15	1.5	9.488	0.827	Accept
	Builders	15	1.233	9.488	0.873	Accept
	Engineers	15	2.067	9.488	0.723	Accept
	Estate Surveyors	15	4.5	9.488	0.343	Accept
	Quantity Surveyors	15	2.867	9.488	0.58	Accept

**N= Number of factors*

Table 5: Text of Variation of Effect of the Factors Affecting the Adoption of the Survival Strategies among the Respondents

Parameters Tested	Respondent groups	N	x^2cal	x^2tab	P-Value	Decision
The relative importance of survival strategies	Architects	23	0.241	9.488	0.994	Accept
	Builders	23	0.677	9.488	0.954	Accept
	Engineers	23	1.068	9.488	0.899	Accept
	Estate Surveyors	23	0.293	9.488	0.99	Accept
	Quantity Surveyors	23	1.193	9.488	0.879	Accept

**N= Number of factors*

The results of the Kruskal Wallis test presented in Table 4 indicate that the calculated chi-square ($\varkappa 2$) values obtained for all the respondent groups, that is, 1.500, 1.233, 2.068, 4.500 and 867 are less than the table value of 9.488. The indicative hypothesis is therefore accepted, and the inference is that the perceptions of construction professionals on the relative importance of the survival strategies for SMCFs do not differ significantly. Also the p-value (asymptotic significance) for each of the respondent group, that is, 0.827, 0.873, 0.723, 0.343 and 0.580 is greater than 0.05 further confirm that there is no variation in the perceptions of the respondent groups regarding the importance of the survival strategies for SMCFs in the study area. This may be attributed to the general understanding of the respondents of the relationships between strategies and business survival. The result supports Nobre and Silva (2014) and Fadanhusi (2012) that there is a positive correlation between adoption of survival strategies and SME`s survival.

Similarly, the results in Table 5 indicate that the calculated chi-square ($\varkappa 2$) value obtained for all the respondent groups, that is, 0.241, 0.677, 1.068, 0.293 and 1.193 are less than the table value of 9.488 implies that there is no significant variation in the perceptions of construction professionals on the effect of the factors affecting the adoption of the survival strategies for SMCFs in the study area. The p-value (asymptotic significance) of 0.994, 0.954, 0.899, 0.990 and 0.879 all greater than 0.05 which also confirm that the effect of the factors affecting the adoption of the survival strategies for SMCFs does not vary significantly among the selected construction professionals involved in the study. This supports the study by Gilmore, Carson, and Rocks (2006) who blamed the problems of adoption on several particular characteristics and constraints of SMEs such as lack of time, limited budgets, lack of marketing expertise, lack of market information, and lack of planning. Consequently, the two research hypotheses that the perceptions of construction professionals of the relative importance of the survival strategies for SMCFs, as well as the relative effect of the factors affecting the adoption of the strategies do not differ significantly in the study area were retained. Besides, the overall view of the respondents is further analysed in the following sections.

6.2 Evaluation of Survival Strategies of SMCFs

This section consists of an evaluation of fifteen variables of survival strategies for construction entrepreneurship (which also include SMCFs) identified through literature review and pilot survey. The combined data of the respondents were analysed to determine the perception of selected project team members on the level of importance of survival strategies SMCFs. The decision to combine the data for the analysis is based on the conclusion earlier drawn that there is no variation in the perceptions of the respondents in the level of importance of survival strategies for SMCFs growth in the study area. The result of the analysis, which indicates the MS of each factor, standard deviation (SD), rank and remark column indicating the significance of each factor are as presented in Table 6.

The result of the analysis shows that all the factors are significant with the MS of the factors range as $3.43 \leq MS \leq 4.80$. Ten of the factors have very high significance (VHS) with the remaining five factors ranking high significance (HS). The results reveal that the innovation is the most significant survival strategy, while the least factor is autonomy. Among the top five most significant survival strategies for construction entrepreneurial are innovativeness (MS = 4.80, SD = 0.81), required skills (MS = 4.70, SD = 0.70), willingness to take risk (MS = 4.67, SD = 0.83), entrepreneurship attitudes and behaviours (MS = 4.60, SD = 1.07), and entrepreneurial organization structure and strategies (MS = 4.55, SD = 0.79). However, the five least significant factors are environmental factors (MS = 4.18, SD = 1.28), human

resource management (MS = 3.99, SD = 1.62), corporate venturing (MS = 3.83, SD = 1.24), competitive aggressiveness (MS = 3.50, SD = 1.10), and autonomy (MS = 3.43, SD = 1.08).

Table 6: Survival Strategies for Construction Entrepreneurship at Infancy Stage

S/n.	Factors	Mean score	Std. Deviation	Rank	Remarks
1	Innovativeness	4.80	.81	1st	VHS
2	Required skills	4.70	.70	2nd	VHS
3	Willingness to take risk	4.67	.83	3rd	VHS
4	Entrepreneurial attitudes and behaviours	4.60	1.07	4th	VHS
5	Entrepreneurial organization structure and strategies	4.55	.79	5th	VHS
6	Financial resource management	4.44	.88	6th	VHS
7	Proactiveness	4.41	.55	7th	VHS
8	Organizational flexibility and speed	4.38	1.08	8th	VHS
9	Adaptability	4.34	.57	9th	VHS
10	Entrepreneurial competencies	4.30	1.04	10th	VHS
11	Environmental factors	4.18	1.28	11th	HS
12	Human resource management	3.99	1.62	12th	HS
13	Corporate venturing	3.83	1.24	13th	HS
14	Competitive aggressiveness	3.50	1.10	14th	HS
15	Autonomy	3.43	1.08	15th	HS

The result of this study supports the previous findings of Ifemkwe and Adedamola (2016), who found a statistically significant relationship between survival strategies and SMEs' sustainability. A similar study conducted by Jegede (2018) further confirms the result of this finding stating that the innovative ability is a sine-qua-non for the survival of the entrepreneur and growth of the small business to a large business. Findings reveal innovation strategy as the most significant for the survival for SMCFs at the infancy stage. Innovation involves the analysis of dynamic competition, the pattern of investment, pricing and brand recognition strategies (Schmalensee, 2002). Supporting the findings from the previous study, Hurley and Hult (2008) classified innovation into two dimensions which include innovativeness and innovation capability. According to the authors, innovative firms accept and adopt new ideas, products, processes and organizational forms while innovation capability equips firms with an ability to implement and realize innovation. In construction, innovative ideas are critically needed not only to survive the turbulent stage of survival but also to meet the needs of clients in given value for their hard earn income.

Required skill in any endeavour is an essential attribute that differentiates high performers from average performers. In order for an entrepreneur to weather the storm of challenges at the infancy stage, it is highly necessary to acquire the required skills. This is in agreement with Barbero, Casillas and Feldman (2011) who assert that SMEs should possess high capabilities in specific functional areas, to grow fast and intensively. According to Olagunju (2004), entrepreneurial skill is the individual ability to create a new business through the exploitation of an idea in other to benefit both the individual and society. Skills are required in daily operation, finance, marketing, human and non-human resources, as well as general management. Construction entrepreneurship, among other things, needs creative, innovative, managerial, analytical, marketing, communicative, technical, and interpersonal skills in order to survive the present competitive and volatile economic and political environment. These also help to achieve maximum profitability and productivity sufficient for the survival of the organisation at the infancy stage. The finding is also in agreement with the study of Akhamiokhor (2017), which reveals a significant relationship between employee productivity and human resource strategies in the selected SMEs. Another critical strategy identified in the study for the survival of SMCFs is the willingness to take risks. A successful construction entrepreneur is viewed as a risk-taker who anticipates risks and the potential impact in advance. Generally, the construction project is a complex endeavour inherent with risks and uncertainties. Construction business owners must, therefore, anticipate risk, strike when it is opportune, and effectively manage when there is a threat. This finding is similar to the study by Putniņš and Sauka (2013) who find higher performance as a result of the reward for taking constructive risks. The finding is also in line with Jegede (2018), who states that the lower the risk, the lower the profit. The author adds that a riskless venture hardly possesses any tangible profit and that risk is variability in return.

Entrepreneur`s attitude, traits and behaviour are important strategies that enhance entrepreneurial capability and competence for business growth and survival. According to Harvie, Narjoko and Oum (2010), entrepreneurial attitudes are those important characteristics needed by SMEs to upgrade their positions in production networks. This concurs with Markman and Baron (2003) who state that the closer the match between the individual's characteristics and the requirements of being an entrepreneur, the more successful the individual will be. Characteristics of the entrepreneur, which include his socio-demographic characteristics, background characteristics and personality characteristics are necessary for business survival. This finding is also consistent with the previous findings by Gurol and Atsan (2006). An entrepreneurial organization is described as a consciously coordinated social entity, with a relatively identifiable boundary to achieve a common goal or set of goals (Robbins & Mathew, 2009; Abd-Hamid et al.,

2015). A well-designed organization structure of the construction business, as revealed in this study is an effective strategy fundamental to the survival and success of entrepreneurship. Previous studies also find a strong positive link between organizational structure and entrepreneurship survival of business and construction projects (Shahu, Pandir, & Ganapathy, 2012).

6.3 Assessment of the Factors Affecting the Adoption of Survival Strategies for SMCFs

This section consists of combined data of the perceptions of the respondents on the effect of the 23 factors identified from literature that affect the adoption of survival strategies of entrepreneurship. The combined data were used having ascertained that there is no variation in the perception of the respondents on the effect of factors affecting the adoption of survival strategies for SMCFs in the study area. The result of the analysis, which indicates the MS, SD, rank and remark column indicating the significance of each factor are as presented in Table7.

Table 7: Factors Affecting the Adoption of Survival Strategies for SMCFs

S/n.	Factors	Mean score	Std. Deviation	Rank	Remarks
1	Availability and access to finance	4.89	.46	1st	VHS
2	The poor state of the country's infrastructure	4.81	.75	2nd	VHS
3	Poor managerial/executive capacity of the implementing agencies	4.69	.85	3rd	VHS
4	Characteristics of entrepreneurs	4.62	.94	4th	VHS
5	Failure to adapt to the changing business environment	4.57	.87	5th	VHS
6	Low technological capacities	4.51	.84	6th	VHS
7	Inadequate business planning	4.44	1.32	7th	VHS
8	Lack of motivation	4.42	1.26	8th	VHS
9	Lack of commitment to solve its problems	4.41	1.14	9th	VHS
10	In-appropriateness of some of the recommendations	4.37	1.24	10th	VHS
11	Corruption	4.28	1.42	11th	VHS
12	Human resources capacities	3.98	1.52	12th	HS
13	Access to information	3.71	1.65	13th	HS
14	Lack of support from expected quarters	3.63	1.67	14th	HS
15	Inconsistent government policies	3.60	1.26	15th	HS
16	Education background	3.51	1.21	16th	HS
17	Networking	3.45	1.18	17th	HS
18	Lack of management skills and training	3.45	1.78	18th	HS
19	Location of the enterprise	3.22	1.68	19th	MS
20	Problems caused by the stakeholders	3.05	1.79	20th	MS
21	Lack of resources for implementation	2.83	1.82	21st	MS
22	Cumbersome legal and regulatory constraints	2.75	1.02	22nd	MS
23	Problems caused by the immediate local community	2.67	1.86	23rd	MS

The result of Table 7 shows that the rank of the factors range from $2.67 \leq MS \leq 4.89$, with the most prevalent among the factors being availability and access to finance with MS = 4.89 (SD = 0.46); the least ranked factor is problems caused by the immediate local community with MIS = 2.67. Eleven of the factors have very high significance (VHS); five factors have high significance (HS), while the remaining five factors have medium significance (MS). Poor state of the country's infrastructure (MS = 4.81, SD = 0.75) ranks second, followed by poor managerial / executive capacity of the implementing agencies (MS = 4.69, SD = 0.85). Characteristics of entrepreneurs (MS = 4.62, SD = 0.94) ranks next, while failure to adapt to the changing business environment (MS = 4.57, SD = 0.87) ranks fifth. Among the least ranks factors are problems caused by the stakeholders (MS = 3.05, SD = 1.79) and lack of resources for implementation (MS = 2.83, SD = 1.82). These also include cumbersome legal and regulatory constraints and problems caused by the immediate local community with MS 2.75 (SD = 1.02) and 2.67 (SD = 1.86) respectively, as shown in Table7.

The findings show that several factors are affecting the adoption of survival strategies for SMCFs which can be categorized into three based on the previous studies, namely: personal characteristics of entrepreneur, internal and external characteristics of an entrepreneurial organization. The prevalent among the factors are further discussed in this section. Availability and access to finance; this factor ranks most by the respondents as affecting the adoption of survival strategies for SMCFs. This factor is a critical issue among construction entrepreneurs in most states of the federation and many developing countries. This result is similar to the finding of a study earlier conducted by Afolabi (2013) who identifies financial constraints explained by high lending rates and high loan requirements as the major cause of the absence of a strong and virile SMEs sub-sector in the Nigerian industrial development process. This was shared by Kim, Knotts and Jones (2008) who argue that limited access to financial resources may restrict more substantial

investments especially those that require a more extended payback period, creating a growth and development barrier. Findings also show that Chad-Cameroon pipeline project worth US$4.2 billion which was one of the most expensive projects funded by the World Bank in Africa at the time failed because World Bank withdrew its financial backing (Fabian & Amir, 2011). A good entrepreneur as a matter of necessity, should have a sound knowledge of project financing, especially large scale and privately financed projects. A project of this nature is often complex owing to the involvement of several stakeholders, the high costs and risks, and the long duration of project development and the contract duration.

The poor state of the country's infrastructure has been an unresolved problem in the entire nation for several decades. It is not a surprise that this factor is highly ranked in this study. It is a critical issue facing entrepreneurs and concern individuals in the country. The result of the study is in agreement with previous studies by Jegede (2018), the finding reveals associated infrastructural problems such as shortage of water supply, inadequate transport systems, lack of electricity to improper solid waste management as a major factor affecting the survival and growth of SMEs in developing economy. The finding is also consistent with the report of a survey on the competitive performance of 144 economies worldwide conducted by World Economic Forum on Global Competitiveness in 2014 in which Nigeria was ranked low in the quality of its infrastructure (Damoah, 2015). The poor managerial system is a major factor responsible for the failure of implementing the recommended strategy or policy that promotes organizational existence or perhaps using the wrong approach. This is in agreement with Dandira (2011) who notes that even though remarkable progress has been made in the field of strategic management, the problem of strategy implementation failure persists. The problem of the poor managerial system identified in this study is consistent with the findings by Mba and Cletus (2014) who opine that inefficiency in overall business management and poor record-keeping is a major feature of most SMEs. Other challenges include technical problems/competence and lack of essential and required expertise in production, procurement, maintenance, marketing and finances which are also identified as factors that lead to funds misapplication, wrong and costly decision making. The implications are very critical and can eventually lead to the death of the SMCEs.

Findings reveal that the entrepreneur`s characteristics are one of the most influential factors that affect business performance and competitiveness in the market (Simpson et al. 2004). These characteristics, among other things, include the age of the entrepreneur, gender, education and family background and previous experience (Guzman & Santos, 2001; Ucbasaran et al., 2004). These factors can either motivate or demotivate an entrepreneur from being proactive and taking specific actions where necessary. The result of this study is in agreement with the findings by Markman et al. (2007) which relate personal perseverance to a person's capability to persist in the face of difficulties, risks, and failure. The authors maintain that such persons will consistently rise and breakthrough, and as they persevere, they become more skilled and empowered to tackle the next adversity. Inability to manage the ever occurring changes in business environments can as well hinders entrepreneur in achieving success. Changes witnessed in business environments may be from internal or external sources. Internal sources may include changes in project scope, technology, time and cost. External factors, on the other hand, include opportunities, threats, technology, macro-environmental factors, political climate, and information available in the market which will potentially affect all entrepreneurs, regardless of their background, business sector, or business concept (Dahlqvist, Davidsson & Wiklund, 2000; Adu & Ekung, 2019). Findings from previous studies reveal that inability to manage these changes contribute to project failure (Kaliba, Muya & Mumba, 2009).

7. Conclusion and Recommendations

This study investigated survival strategies for SMCFs at infancy stage and factors affecting the adoption of the strategies. Based on the findings above, the study concludes that ensuring the survival of SMCFs at infancy stage depends upon understanding and effective application of specific strategies. The five most dominant among the strategies are: "innovativeness", "required skills", "willingness to take the risk", "entrepreneurial attitudes and behaviours", “entrepreneurial organization structure and strategies”, and “financial resource management”. Apart from effective management of human and financial resources, entrepreneur competencies and networking in managing entrepreneurial environments are also identified as a panacea for success and survival of SMCFs at the infancy stage. The study also concludes that adoption of the strategies for survival of entrepreneurship is not without challenges which can undermine the effort in achieving the desired goal. Critical among these challenges are: “availability and access to finance", "poor state of the country's infrastructure", "poor managerial/executive capacity of the implementing agencies", "characteristics of entrepreneurs and failure to adapt to the changing business environment". It was further concluded that the respondents had a common view of survival strategies and factors affecting the adoption of these strategies in the study area. Finally, the study concludes that without concerted efforts of government in providing enabling entrepreneurship infrastructure, the gap created in employment generation, national economy and poverty will continue to exist as a result of an increase in the mortality rate of SMCFs at the infancy stage.

This study recommends that to survive in the current dynamic and competitive construction business environment, SMCFs should adopt any or a combination of the strategies highlighted in this study. Owners of SMCFs should also be involved in regular training to acquire the required skills in the management of human and non-human resources. Government through different Support Initiatives and Programmes, should ensure the survival of newly created and registered business firms, especially within the seven years of its existence in the business. There is also a need for a conducive and enabling environment for businesses to thrive through the

provision of adequate infrastructures. As a way of ensuring the survival of the industry, the government should also set up monitoring and evaluation teams saddled with the responsibility of ensuring steady progress of enterprises and offer advice where necessary. Incentive schemes should be made available for the smooth take-off of newly established SMCFs as well as extending this Initiative to foreign investors. Government policy should help, among other things, to reduce administrative costs and regulatory burden at the same time encouraging SMCFs in accessing loans from commercial banks and lending institutions. A study of this nature should be carried out in other state capitals and geo-political zones for comparison and generalization of the findings in Nigeria and developing countries of the world.

8. Limitations of the study

The major limitation of the study is the total dependence on the views of the respondents and that the study focused mainly on survival strategies for SMECFs in the construction industry at the infancy stage. The findings might specifically apply only to similar contracting organizations and not the majority of SMCFs.

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Addressing Constraints for Effective Project Finance for Infrastructure Projects in Emerging Economies – the Case of Zimbabwe

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Abstract

The infrastructure deficit in developing countries is vast and current developmental initiatives fail to meet the requirements. There is a need for housing, clean water, sewerage facilities, transport and telecommunications infrastructure. The development of infrastructure requires large amounts of funding, which could be a project or non-recourse finance. The levels of project finance allocated to developing countries are much smaller compared to the developed world. The purpose of this paper is to determine the critical success factors for accessing project finance for infrastructure development in a developing country, Zimbabwe. This study employed the quantitative approach using a survey questionnaire to address various aspects that are important when lenders advance project finance. The questionnaire was distributed to participating organizations comprised of lenders, borrowers and investors with the higher numbers being borrowers. These organizations include banks in Zimbabwe that offer project finance for infrastructure, Pension funds which invest in infrastructure, Multilateral agencies operating in Zimbabwe, and Municipalities of major cities in Zimbabwe. The interrater reliability of the individual factors was calculated. Also, the aggregate interrater reliability for the different attributes was determined using Cronbach's alpha value. A total of 33 factors under five attributes were identified: governmental, financing, project, special purpose vehicle, and politics and economics were identified as being critical for accessing project finance. These factors were ranked according to their significance index or importance. Only 12 factors were considered as extremely important as critical success factors for project financing in Zimbabwe. The contribution of this study is to provide government, project finance agencies, private sector and other stakeholders interested in infrastructure projects with a list of the most important critical success factors for infrastructure projects in a developing country.

Keywords: Critical success factors, Infrastructure development, Infrastructure projects, Project attributes, Project finance

1. Introduction

The infrastructure deficit in developing countries is enormous, and current developmental initiatives fail to meet the requirements. There is a need for housing, clean water, sewerage facilities, transport and telecommunications infrastructure. In some countries, for instance, the only form of transport connecting major centres is air travel because there is no road network linking the towns. This affects trade on many levels as there is no free movement of goods and people. Countries such as Zimbabwe are strategically located and can and act as goods in transit hub between South Africa and countries to the north. Zimbabwe faces several infrastructure challenges, mostly in the power and water sectors, where deteriorating conditions pose risks to the economy and public health (Pushak and Briceño-Garmendia, 2012).

Zimbabwe has struggled to attract Foreign Direct Investment (FDI) as well as project finance, therefore, failing to implement much-needed infrastructure projects. These include the rehabilitation of existing infrastructure and construction of new infrastructure. While the link between infrastructure and economic development is often subject to debate, it cannot be disputed that the availability of infrastructure will facilitate trade. Increased trade, in turn, can lead to economic growth. A World Bank report has suggested that a 1% increase in the infrastructure stock leads to a corresponding 1% growth

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in the Gross Domestic Product (GDP) of the country (Pushak and Briceño-Garmendia, 2012).

The purpose of this study is to determine the factors that are critical for accessing project finance in a developing country. A country like Zimbabwe needs to spend $2 billion per annum up to 2021 to reduce its infrastructure deficit (Pushak and Briceño-Garmendia, 2012). It appears that generally, the countries that have the highest infrastructure deficits tend to be also the ones that are less able to access project finance (Yescombe, 2013).

Access to project finance for infrastructure development is an essential facet of economic development needed in developing countries. Several critical infrastructure projects in Zimbabwe and other developing countries fail to take off or are not completed due to lack of project finance. These countries end up abandoning these projects or using other means of financing that are costly and detrimental to their economies in the longer run.

This study seeks to determine critical success factors for access to project finance to assist Zimbabwe to implement infrastructure projects.

2. Literature Review

Some studies have been carried for various aspects of project finance in infrastructure development (Kumari and Sharma, 2017; Osei-Kyei and Chan, 2015). These studies considered literature from the early 1990s to 2015 and have identified 149 published articles of utter importance. This study may not be exhaustive, but it extensively covered the published materials and gave a good indication of the state of affairs on infrastructure-based research. The study showed that project finance for infrastructure had received the lion's share of the research on infrastructure at 36%, closely followed by the role of infrastructure at 29% of the published articles.

In infrastructure financing research, the covered areas are majorly public funding, private funding, foreign direct investment, public-private partnerships, risk mitigation and innovation in project finance. The participation of private capital in infrastructure development is very much an essential aspect of project finance. This form of participation usually involves project finance and is mostly referred to as a Public Private Partnership (PPP). The debt, equity and mezzanine portions have private businesses participating in the form of banks, insurance companies and pension funds. The studies on Public Private Partnership (PPP) therefore interrogated how certain conditions within the different markets impacted on successful implementation. The nature and scope of PPP arrangements may vary, but this partnership will likely continue to subsist and grow into the future.

The use of PPP has been studied extensively in the literature (Sharma, 2012; Ameyaw, Chan and Owusu-Manu, 2017; Zangoueinezhad and Azar, 2014; Wibowo, 2015; Ahmadabadi and Heravi, 2019; Sarmento and Renneboog, 2016). Sharma (2012) investigated the factors that determine PPP in infrastructure-based mainly on data from developing countries for the period 1990 to 2008. The research outcomes suggest that the size of the country and income of the market has a bearing on the chances of attracting successful PPP deals. Other studies on PPP looked at the contribution of PPP to economic growth (Zangoueinezhad and Azar, 2014). They realized that three factors of the PPP affect economic growth. Namely, the number of PPP projects underway, the value of the project and the ideal type of PPP contracts in place. Sarmento and Renneboog (2016) researched the anatomy of PPP about the renegotiation of the contracts. This article suggests the high prevalence of renegotiation of PPP contracts. While some renegotiations are generally provided for in the contract, a high prevalence has been observed. The article sought to delve into the reasons for the renegotiations using case study research for two projects in Portugal. The case studies looked at two projects that had very different outcomes from the renegotiations, one beneficial and the other detrimental. The article also noted some of the pitfalls of PPP where a winning bidder can become opportunistic. They will find themselves in a situation where they are virtually a monopoly and use this opportunity to renegotiate more favourable terms for themselves. This would not be expected in the face of competition.

A review was conducted on PPP with a specific focus on Zimbabwe (Zinyama and Nhema, 2015). The study was an attempt to weigh into the debate on PPP, global practices, and also looking at the case of Zimbabwe. The study's findings were that there is a low uptake of PPP in Zimbabwe as a result of the lack of legal and institutional structures for PPP. There have been attempts in Zimbabwe to put up the necessary framework to facilitate the employment of PPP. These efforts have not gone far enough and remain largely unimplemented according to the research. Zimbabwe was the setting for this research study.

2.1 Infrastructure development in developing countries

Population growth, especially in the emerging markets, has created an infrastructure deficit that will require annual expenditure on the infrastructure of $2.6 trillion for the next twenty years (Mostafavi et al., 2014). The United States of America on its own is estimated to require a total of $3.6 trillion from 2013 to 2018, for the rehabilitation and improvement of the ageing infrastructure (Mostafavi et al., 2014). The available resources and what is required to bridge the infrastructure gap do not match, leading to challenges in accessing finance. Project finance has been employed successfully in both the developed and developing countries to provide infrastructure. It has been extensively applied in the developed world in which the participation of private capital is encouraged through PPP. Likewise, it has also been applied widely in developing countries, although at a much lower scale in comparison.

Traditionally the function to develop infrastructure has typically been that of the government of the particular country. Some of the infrastructures are part of what is known as public goods. Citizens pay tax to the government, and in return, they expect the provision of public goods by the government in the form of roads, schools, airports, hospitals and telecommunication networks. This is the sort of model that has been employed over time by many countries. Most of the governments controlled these assets through ownership of vertically integrated utilities and other entities. In Zimbabwe, such

utilities are organizations like the Zimbabwe Electricity Supply Authority (ZESA), Telone, Zimbabwe National Roads Authority (ZINARA). They are all wholly owned by the government, although they run like private companies with a board of Directors and Executive management, most of whom are government appointees. Although they are supposed to be autonomous in the manner in which they are run, most of these companies in most countries are mere extensions of government departments. It is also important to note that some of the infrastructure or public goods are monopolistic, for instance, the power supplied by a public utility.

However, the expectation that governments on their own will be able to provide infrastructure has proven to be difficult and even impossible, given the fiscal constraints in many countries. Budget constraints, past experiments of inadequate public spending and inefficiencies in managing infrastructure on the public side have led to a reconsideration of the need to shift the investment effort to the private sector and the development of PPPs (Della Croce and Gatti, 2014). This is particularly true in developing countries where resources are minimal, and revenues from tax alone are insufficient to address the infrastructure needs. As a result, there is a huge infrastructure deficit in developing countries which manifests itself in the form of limited access to water, power, poor or no communications and traffic congestion in urban areas. In some countries, major urban centres can only be accessed by air because no road networks are linking these towns. Shortage of social infrastructure is also prevalent, leading to limited or no access to health facilities and educational facilities.

The involvement of private capital is therefore necessary and inevitable. It has been demonstrated that the participation of private companies in the development of infrastructure also results in the improvement of skills and project quality. It is estimated that developing countries will require $1 trillion in annual infrastructure expenditure until 2020 (Report from World Bank Group, 2013 cited in Yusupov and Abdullah, 2014).

In their literature review on infrastructure and project finance, Kumari and Sharma (2017) observed that in most research, although several studies have been done on infrastructure, the dominant discussion has been how to arrange more finance for infrastructure development. Many articles have been published on physical infrastructure like transportation, telecommunications, power and irrigation (Sharma, 2012; Ameyaw et al., 2017; Zangoueinezhad and Azar, 2014; Wibowo, 2015; Ahmadabadi and Heravi, 2019; Sarmento and Renneboog, 2016); there is very little published research on social infrastructure (Kumari and Sharma, 2017). Review of literature also revealed a correlation between the availability of physical infrastructure and economic growth. Other studies have also shown that electricity is an essential element for improving living standards, thus facilitating national economic development (Kale and Pohekar, 2012). This is easy to comprehend in that most of the industrial machinery used in the production of goods runs on electrical power.

The transport sector was also noted as being crucial for economic development in some of the studies (Carbonara et al., 2015; Babatunde and Perera, 2017). Infrastructure facilitates the movement of goods, services and people. This sector requires significant amounts of investment, and in some studies, investors were reluctant to invest in road networks due to the long construction periods. The research on private, public partners has also been pervasive covering both developed as well as developing countries. The PPP model stem out of a need for alternative funding for infrastructure due to the inadequacy of public funding. The literature on PPP for infrastructure has involved studies on risk management (Carbonara et al., 2015; Crăciun, 2011), Implementation constraints in PPP projects (Osei-Kyei and Chan, 2017), the impact of PPP on project costs (Deng et al.,2016).

The use of project finance for infrastructure development in developing countries has been widespread and successful. Developing countries in East Asia and South America have been utilizing much of the project finance, as indicated by the higher capital flows to these countries (Yescombe, 2013).

The share of the project finance for sub-Saharan Africa for the years 2003 – 2013 was only 3% of the world total. During those years, the infrastructure projects for the region benefitted from a debt of $59 billion, whereas the world total was $2 trillion (Dornel, 2014). The leading countries in accessing this project finance in Africa are Nigeria, South Africa, Ghana, and Angola.

Project finance is seen as a solution to the funding problems facing developed and developing countries (Yusupov and Abdullah, 2014; Munzara, 2015). Innovative financing sources that employ financial engineering tools are finding wide application in projects in developing countries. Project finance is one of these sources of financing that combines both financial engineering and innovative financing features (Yusupov and Abdullah, 2014). The project finance contribution to the development of infrastructure in Zimbabwe is unknown as there are currently no published articles on this area.

2.2 Studies on the risk assessment and mitigation in project finance

Project finance has an inherent risk that must be mitigated to attract the interest of lenders and investors alike. The fact that this type of financing is non-recourse complicates rather than making matters easier. Some studies have also focused on the issue of risk involved in project finance for developing countries (Crăciun, 2011; Srivastava, 2014; Babatunde and Perera, 2017). The identification of risks, assessment of their impact and mitigation is an essential aspect of project finance.

The formation of the Project Company or Special Purpose Vehicle (SPV) is one of the risk mitigation initiatives. The success of any financial deal rests upon future cash flows of the project. The creation of the SPV is a way of ringfencing project cash flows and assets (Yescombe, 2013). This, according to Srivastava (2014), provides bankruptcy remoteness of the project and its assets from financial problems the sponsors may have. The reverse benefit for the sponsors is that they do not have the project difficulties contaminating their existing balance sheets. This aspect encourages Sponsors to venture into projects under this arrangement as they do not fear that the failure of the project will affect their

existing businesses. Srivastava (2014) also gave a brief insight into how lenders appraise risks for project finance. The study noted that banks in India identify project risks and appraise them then categorize them into high, medium and low risk based on the probability of the risk factor happening and the severity of the impact.

Another study by Babatunde and Perera (2017) looked at the risks involved in traffic revenue for road projects under the Build Operate and Transfer (BOT) model. In the BOT model, where the project cash flows arise from user payments, traffic volumes must be predicted during the project conception. These predictions or estimates may be far from the truth during the operation phase. If they are lower than predicted, then the project will be in trouble, and so this is a risk that must be considered and mitigated. The users may also refuse to pay, and the E-tolls in South Africa is a case in point. Babatunde and Perera (2017) identified 25 risk factors to road traffic revenues, and 13 of these were considered to be critical. The top five most risks include Loss due to adverse government decisions/policies, Loss due to resistance to pay, faulty project structuring, Politically motivated resistance, and Government inaction due to political/social reasons.

Therefore, risks are real impediments to the implementation of project finance for infrastructure development. The risks must, therefore, be mitigated effectively to allow structuring of project finance deals.

The share of projects finance that ends up in the developing countries is minimal in comparison to the developed world. Sub-Saharan Africa, which is one of the least developed continents, only had 3% of the project finance in the years between 2003 and 2013 (Dornel, 2014). The influence of political and other risks on the ability to develop countries to access project finance is an area that still needs to be explored.

Several studies have been conducted in Sub Saharan Africa on the various aspects of the employment of project finance in infrastructure development. These included the state of project finance research (Kumari et al., 2016), the critical success factors for accessing project finance (Babatunde et al., 2012; Ameyaw et al., 2016; Sharma, 2012), the barriers to accessing project finance (Babatunde et al., 2015; Badu et al., 2012), risk mitigation in project finance deals (Crăciun, 2011; Srivastava, 2014; Babatunde and Pererab, 2017), the application of innovation in the provision of project finance (Mostafavi et al. 2014; Annamalai and Hari, 2016). However, it is clear from the literature that a few of the studies cited cover Zimbabwe specifically, and this was the subject of this research.

3. Research Methodology

This study employed a quantitative approach to investigate and gather data on project financing in a developing country.

3.1. Questionnaire Development and administration

A questionnaire was prepared for this research based on the aspects usually considered necessary by project finance providers. Previous studies on the subject matter were also considered when designing the questionnaire (Ameyaw et al., 2017; Al-shareem and Yusof, 2015; Wibowo and Alfen, 2015; Swamy et al., 2018).

The questionnaire employed in this research was carefully crafted and the quality checked by individuals with knowledge on the subject matter. This is the approach that was employed for this research to solicit responses that assisted in answering the research questions.

The questionnaire had some sections dealing with different aspects of the research. The first part of the questionnaire comprised of questions that sought to gather information on participating organizations and respondents. The intention was to distribute the questionnaire to people with knowledge and experience on project finance and could, therefore, comment appropriately.

The second section consisted of various aspects that are considered to be important when lenders advance project finance. These aspects are Project attributes, Government attributes, Financing attributes, Political and economic attributes, and Special purpose vehicle attributes.

The respondents were asked to rate various important factors that fall under the attributes documented above according to their importance for accessing project finance.

The opinions of people considered experts on the subject matter were sought through their responses on a set of questions posed in a questionnaire. The questionnaire was pre-tested to assist in determining whether:

i. The instructions of the questionnaire were easy to follow and understand.
ii. The statement sequence is logical.
iii. The language and wording were understandable.

This method offered the benefit of providing information on large groups of people with ease and convenience in a timely and cost-effective manner. The questionnaires made it possible to determine the most important factors for those who offer project finance.

3.2. Data Collection

The data was collected from organizations in Zimbabwe involved with infrastructure development or in the provision of project finance. The research sought to establish the reasons for the failure to access project finance. There were two groups involved in this study, those who use the project finance and those who provide it. A questionnaire was sent out to all parties concerned who are;

i. Banks operating in Zimbabwe that ordinarily would offer project finance for infrastructure.
ii. Pension funds which invest in infrastructure.
iii. Multilateral agencies operating in Zimbabwe and the region
iv. Municipalities of the major cities in Zimbabwe;
v. Parastatal organizations;

The data was drawn from both the lenders and the borrowers of project finance.

Survey questionnaires were distributed electronically, and also hard copies were delivered to the sample population, requesting them to participate in the survey. Respondents were required to submit the questionnaires within 15 days after receiving them.

3.3. Data Analysis

The completed questionnaires were checked for any obvious errors. Any clarification required was sought from the respondents. The questionnaires were coded with respondents being identified as AA001 to AA00N the last number. The various responses on the Likert scale were coded with numbers from 1 to 5 or as appropriate. The data was then entered onto an excel workbook. Worksheets were created in the workbook, each one representing each of the attributes. The data was thoroughly checked for transcription errors before any evaluation was done.

The study was descriptive, as it sought to establish the relationship between the conditions within the country and the attitudes of organizations and investors to get involved in infrastructure development. A significance index was calculated from the responses given by the respondents according to the formula below (Ameyaw et al., 2017);

$$SI_i = \frac{\sum a_i \times X_i}{5} \quad (1)$$

Where SI_i is the significant factor for the ith factor, a_i is the constant applied to the ith response, for example, a_i = 1 extremely low significance and a_i = 5 is extremely high significance, these are the extreme ends of the Likert scale.

$X_i = n_i/N$, where n_i is the variable expressing the frequency of the ith factor and N is the number of respondents.

The significance index is categorized according to Jannadi (1996), SI >0.57 is significant, and it is called critical success factor, SI < 0.57 are not regarded as critical, and SI>0.86 is extremely significant.

The reliability of a measurement refers to the ability to produce the same result over repeated measurements consistently. The interrater reliability of the individual factors was calculated. Besides, the aggregate interrater reliability for the different attributes was also determined using Cronbach's alpha value. This was calculated from the analysis of variance (ANOVA) two factor without replication from excel. The interrater reliability values were also calculated using the formula below (Ameyaw et al., 2017);

$$\alpha = 1 - \frac{2 \times S_X^2}{[(H+L)M - (M^2) - (H \times L)] \times \left[\frac{k}{k-1}\right]} \quad (2)$$

Where: S^2_X is the average variance of the critical success factors, α is the interrater agreement, H is the highest value of the measurement scale, L is the lowest value of the measurement scale, M is the mean score, K is the number of respondents

The study used interrater reliability measurement guided by LeBreton and Senter (2008), 0.00 - 0.3 (lack of agreement), 0.31 - 0.50 (weak agreement), 0.51 - 0.70 (moderate agreement), 0.71 - 0.90 (strong agreement) and 0.91 - 1.00 (very strong agreement). The cut-off point greater than 0.70 for interrater reliability, denotes a high level of agreement among the survey respondents (Brown and Hauenstein, 2005).

4. Results and Discussions

The participating organizations consisted of lenders, borrowers and investors with the greater numbers being borrowers as depicted in table 1. While the population may not be as representative a sample as desired, the research covered the important groups that are involved with project finance in Zimbabwe.

Table 1: The distribution of participating organizations

Type of organization	Number of organizations	Number of respondents
Lender	1	2
Borrower	3	9
Investor	1	1
Other	0	0

Table 2: The loan tenure preference according to participants

Loan tenure preference	Number of respondents
Less than 10 years	0
11-15 years	6
16-20 years	1
Greater than 20 years	6

It was observed that the respondents from the same organization indicated different loan tenure preferences. The results are presented in Table 2 above, which indicates that the preferred loan tenures are generally long, the most prevalent being 11-15 years, followed by greater than 20 years. This is consistent with the loan tenures usually encountered in project finance for infrastructure development (Pinto, 2017; Yescombe, 2013).

4.1 Individual participant information

The individual participants were required to indicate their qualifications and years of experience with project finance. This was used to gauge their level of knowledge and experience with project finance. This would also generally indicate their ability to comment competently on factors affecting the access to project finance.

The respondents possess degrees from tertiary institutions. The respondents with Bachelors' degrees were 46% while the rest have masters' degrees. The results show that 31% of the respondents have less than five years of project finance experience, while 38% have between 11-15 years' experience. It can, therefore, be inferred from the above that the respondents had sufficient knowledge of project finance to comment on its attributes and application.

4.2 Data Reliability

The Cronbach alpha index measured the reliability of the data. The Cronbach alpha index is a way in which interrater reliability is verified. This research looked at factors that were considered to be critical for accessing project finance, and these were grouped into five categories namely, project attributes, government attributes, financing attributes, political and economic attributes and the special purpose vehicle attributes. The Cronbach alpha values were calculated for the above

attributes based on the responses given by the respondents and are presented in Table 3.

Table 3: The Cronbach's alpha values for the attributes studied

Attribute	Alpha value	Data reliability
Project attributes	0.61	Questionable
Government attributes	0.74	Acceptable
Financing attributes	0.89	Good
Political and economic attributes	0.60	Questionable
Special purpose vehicle attributes	0.94	Excellent

The results in the table above indicate that the responses obtained for project and, political and economic attributes are questionable based on the interpretation of the Cronbach's alpha values. The rest of the data for the other attributes has been rated from acceptable to excellent. The questionable attributes seem to have very divergent respondent views on the factors in question but do not seem to apply universally. The interrater reliability value has also been calculated and interpreted for the individual factors.

The individual results for each of the factors are discussed below for all the attributes studied. The review of the individual factor reliability results can give a better indication of what is affecting the aggregate results for the different attributes.

4.3 Validity of results

The questionnaire was administered in a limited duration of time, and its contents were not changed. Respondents were also not affected by the history of having been given the same questionnaire before this research. The respondents who are also considered experts in the subject matter understood the questions in the survey questionnaire. This can be taken as a sign of construct validity. The other matters related to the administering of the questionnaire are also part of the internal validity of the research. This research is, therefore considered to be valid.

4.4 Projects attribute results

The project attribute is at the centre of all activities related to project finance. The project is why financial resources are required, and its characteristics, therefore, may determine access to the project finance. This research would not be possible or make any sense without looking at the project attributes. There were 11 factors examined under project attributes and out of these, there were three attributes in which respondents agreed and strongly agreed with their importance. These are profitability of the projects and demand for the infrastructure, revenue realized from the project and Project repayment period. While the majority of the respondents agreed or strongly agreed with the importance of the other factors, there was also notable numbers of neutral respondents who neither agreed nor disagreed. These ranged from 8% to 25%. Concerning the factors of on-time completion of the project and completion time of the project, 8% of the respondents even disagreed that these were important in accessing project finance. The highest numbers of neutral responses were for the factors related to minimization of risk and the nature of the concession agreement being important to accessing project finance.

Table 4: The interrater reliability values for the different factors for the project attributes

Project attributes	IRA
The repayment period	0.71
The revenue to be realized by the project	0.44
The profitability of the project and demand for the infrastructure	0.61
The cost of the project	0.65
The scope of the project	0.65
The construction period of the project	0.57
The concession period of the project	0.65
The On-time completion of the project	0.27
The Project risk (minimization of risk)	0.33
The nature of the concession agreement	0.33
The existence of an Insurance coverage	0.57

The interrater reliability values obtained for the factors under the project attribute show a general acceptable trend except for nature of the concession agreement, minimization of project risk, the on-time completion of the project and the revenue to be realized by the project, which are all unacceptable. The factor for the revenue to be realized has a high level of respondents agreeing that it is essential for accessing project finance and it is surprising to find it in the list of factors where interrater reliability is deemed unacceptable. This factor shows a very low level of variance of responses and the expectation would be that the interrater reliability would be acceptable. There was strong unanimous agreement among respondents that the revenue to be realized from the project was necessary for accessing project finance.

4.5 Governmental attributes results

The government is a significant stakeholder in the provision of infrastructure in a country. This includes acting as the sponsor of public infrastructure and providing guarantees when required in PPP deals. It also sets the environment in which project finance deals are negotiated and agreed in so many ways. Under the government attributes, ten factors were considered and out of these 6 had an outright agreement, that they were important for accessing project finance. These are the existence of government guarantees, availability of tax exemption or reduction, the existence of Government control and charges, the availability of government permits and approval, clarity of government objectives and the existence of a favourable legal framework that is enforced. It may not be difficult to see why these are important as they have a direct bearing on the success of the project.

The interrater reliability values for factors under the government attributes were all generally found to be acceptable or higher except the stability of the government factor, which was questionable. The

responses from the respondents under this attribute can, therefore, be reviewed without suspicion and be considered reliable. There was very good agreement among respondents for the following factors, the existence of a favourable legal framework that is enforced, the clarity of government objectives, the availability of government permits and approval and the existence of government guarantees. These factors can be considered to strengthen the rights of lenders and investors as well as facilitating the implementation of the project. The factor on the existence of government control and charges received the highest proportion of neutral responses (50%) than any other factor in the questionnaire. A high number of neutral respondents indicates some level of ambiguity in the question or lack of knowledge on the part of respondents regarding the enquiry. The other half of the respondents indicated that this factor was necessary for accessing project finance.

Table 5: The interrater reliability values for the factors under the governmental attribute

Government Attributes	IRA
The existence of Government guarantees	0.76
Availability of Tax exemption or reduction	0.72
The existence of an Incentive for new market penetration	0.63
The availability of Government permit and approval	0.76
The existence of Government control and charges	0.73
The existence of Government support for supply and distribution	0.69
The stability of the Government	0.51
The clarity of Government objectives	0.71
The existence of a favourable legal framework that is enforced	0.82
The existence of a committed public agency as part of infrastructure development	0.65

4.6 Financing attributes results

The financing attribute in this research is concerned with the factors involving the financial characteristics of project finance. The financial resources required for implementing the project are advanced under a set of conditions agreed upon by the contractual parties, the lenders, investors and the borrowers. Some of these conditions are exogenous to the parties involved in the deals. In this research, nine factors were studied under the financing attribute. Out of the nine factors, four of them had a strong agreement among respondents that they are essential for accessing projects finance. These are the equity repayment period, the currency exchange rate, the interest rate and the inflation rate. The rest of the factors while having the majority of the respondents agreeing on their importance for accessing project finance, there was a fair amount of neutral responses ranging from 8% to 17%. No respondents either disagreed or strongly disagreed with the importance of the factors

The interrater reliability values for the different factors were generally in the acceptable range except a few that were questionable. These were the available financial market, the internal rate of return of the project, the payment mechanism and the interest rate. The data for the financing attribute factors can generally be taken to be acceptable.

Table 6: The interrater reliability values for the factors in financing attributes

Financing Attributes	IRA
The Inflation rate	0.71
The Interest rate	0.52
Currency exchange rate	0.71
High equity to debt ratio	0.72
The Payment mechanism	0.57
The Internal rate of return of the project	0.40
The Return on equity of the project	0.66
The Equity repayment period of the project	0.71
The Available financial market	0.57

4.7 Political and economic attributes results

The political and economic attributes of the project are very important for its success. Many projects have run into problems because of a lack of appropriate consideration for these attributes. Four factors were selected for these attributes and respondents asked to rate their importance. The results indicate strong agreement on the importance of factors on the political and economic stability of the country and an effective market for the project outputs. While the responses for the other two factors have an overall agreement for the social acceptability of the project and the existence of political support for the project, there are significant neutral responses and disagreements.

Table 7: The interrater reliability values: factors in the political and economic attributes

Political and Economic Attributes	IRA
The existence of Political support for the project	0.51
The Social acceptability of the project	0.65
The political and economic stability of the country	0.61
An Effective market for the project outputs	0.66

The interrater reliability values for the factors considered lie in the questionable to acceptable categories. The factor on the existence of political support for the project has a questionable reliability value. Again it may be a question of ambiguity that has returned a response that disagrees with its importance in the accessing of project finance.

4.8 Special Purpose Vehicle (SPV) attributes results

In the context of project management, a Special Purpose Vehicle is a company created for the specific purpose to implement and manage the project. Its functions will depend on the scope and model of the project. This is done for several reasons chief among them, the ringfencing of the project revenues and creating bankruptcy remoteness between the project and its sponsors (Yescombe, 2013). This arrangement benefits both the project company as well as the sponsors' other business operations. Respondents were asked about the importance of a Special Purpose Vehicle in accessing project finance. While the majority was in agreement with its importance, a significant number (42%) were neutral, not agreeing or disagreeing with its importance. This may not be a question of ambiguity as with other previous cases of

factors. The infrastructure projects that have been implemented in Zimbabwe may not have followed this model in the past. A good number of them have been run from government departments or the project departments of state-owned enterprises or local authorities.

Table 8: Interrater reliability results for the factor on the existence of the SPV

Special Purpose Vehicle	IRA
Existence of Special Purpose Vehicle	0.74

The interrater reliability value for the factor on the existence of a Special Purpose Vehicle lies in the acceptable category. This means the responses given can be taken as being reliable for this factor.

The nature of the Project Company or Special Purpose Vehicle (SPV) can take many shapes or forms. The characteristics of the SPV may, therefore, have a bearing on the ability of the project to access project finance. Nineteen factors were examined under the SPV attribute, and all of them had high levels of agreement.

Table 9: The interrater reliability results for the SPV factors

Special Purpose Vehicle Attributes	IRA
The Size of the company	0.85
The Type of company	0.85
The Technical Expertise available in the project company	0.40
The Resources available in the project company	0.65
The legal structure of the project company	0.60
The Financial strength of the company	0.65
The Return on asset of the project company	0.65
The projected cash flow of the project	0.47
The Contractor's liquidity	0.54
The existence and magnitude of outstanding loans of the project company	0.33
The Debt level of the project	0.60
The Reputation of the project company	0.80
The level of project management experience	0.57
The Strong commercial track record of the project team members	0.60
Familiarity with industry and client	0.90
The Quality of subcontractors	0.87
The level of Management skills in the project company	0.80
The existence of good corporate governance	0.57
The existence of financial management knowledge in the project company	0.65

However, all the factors also had significant amounts of neutral responses. This may be because there were a significant number of neutral responses to the factor regarding the existence of the SPV. It may follow that if one is neutral about the existence of the SPV, one may also become neutral on the characteristics of the SPV. However, the magnitude of the neutral responses is not uniform and is varying from factor to factor, and their percentages are from 8% to 58%. This may be an indication that the respondents were considering each factor individually in most cases. The factors on the type and size of the SPV were the ones where the most neutral respondents were obtained. This tends to point to a perspective by the respondents that these factors may not be essential in accessing project finance. However, they have not expressed strong sentiments in this regard. The overall verdict is that the factors under this attribute were generally found to be essential for accessing project finance according to the respondents.

The interrater reliability values indicate that the respondents produced reliable results except for the factors on the existence and magnitude of outstanding loans of the SPV, the projected cash flow of the project and the technical expertise of the SPV. These factors are characterized by higher levels of variance in comparison to the other factors under the SPV attribute.

4.9 The critical success factors

The factors studied under the different attributes cannot be assumed to be equally important to the study. This research suffered a major setback in that there was a high rate of poor interrater reliability. The number of factors that were investigated in this study was 54, and out of this 21 did not pass the interrater reliability test giving compliance of 61%. The factors that did not pass the interrater reliability test though important for the study were excluded in the final analysis. The remaining 33 factors were subjected to a significance test to obtain an index between 0 and 1.

These factors were ranked according to their significance index of importance, and only the extremely important factors are discussed below. There were 12 such factors.

The discussion below concentrated on the factors that are considered extremely important for access to project finance. The significant factors were calculated for all the factors in the study, and these were then ranked. The results are reported in Tables 10, 11, 12, 13 and 14 according to the attributes under which they are classified.

Table 10: Critical success factors: accessing project finance under the project attribute

Critical Success Factor – Project Attribute	SI
The profitability of the project and demand for the infrastructure	0.91
The repayment period	0.89
The cost of the project	0.85
The scope of the project	0.83
The concession period of the project	0.83
The construction period of the project	0.78

The above factors were found to be critical for the successful access to project finance, and the SI value indicates their importance relative to each other. These findings are consistent with Ahmadabadi and Heravi (2019) whose research identified reliable contractual agreements and project resilience as some of the critical success factors for project attributes that influence the success of the construction phase of the project. The importance of contractual agreement also came out from other studies, Wibowo and Alfen (2015) who emphases the importance of irrevocable contract; Osei-Kyei and Chan (2017 a) emphasized the importance of well-organized and committed contracting authority; Sharma (2012) who emphasized the importance of the ideal type of PPP contract in use; and Ameyaw et al. (2017)

emphasized the importance of well-designed PPP contract.

These factors are important to ensure project performance. Swamy et al. (2018) identified the importance of stakeholder consent, project structure and baseline information as critical success factors for project performance. The most important factor under project attribute is the profitability of the project and the demand for infrastructure. Ahmadabadi and Heravi (2019) emphasized the importance of economic viability for a project and Alteneiji et al. (2019) emphasises that there has to be a demand for and debt-paying project.

Table 11: Critical success factors: accessing project finance (the Government attribute)

Critical Success Factor – Government Attribute	SI
The clarity of Government objectives	0.88
The availability of Government permit and approval	0.86
The existence of a favourable legal framework that is enforced	0.86
The existence of financial management knowledge in the project company	0.86
The existence of Government guarantees	0.85
Availability of Tax exemption or reduction	0.82
The existence of a committed public agency as part of infrastructure development	0.80
The existence of Government support for supply and distribution	0.77
The existence of an Incentive for new market penetration	0.74
The existence of Government control and charges	0.72

The factors for the governmental attribute, depicted in the above table were considered to be critical in the accessing of project finance in Zimbabwe. This is consistent with literature findings, for an example, Ameyaw et al. (2017) emphasise the existence of an enabling policy and legal framework; and sound legal basis (Wibowo and Alfen, 2015). While, government policies are the main predictor to PPPs implementation in Yemen (Al-shareem and Yusof, 2015); government guarantees, a favourable legal framework, political support and stability (Alteneiji et al., 2019); favourable existing legal framework and policy (Osei-Kyei and Chan 2017 (a)); the importance of government guarantee and experience, and favourable legal and political support as the components of government capability for the success of PPP highway projects in the operation stage; legislative frameworks that support quick and transparent decision making (Zangoueinezhad and Azar, 2014).

Table 12: Critical success factors: accessing project finance (the financing attribute)

Critical Success Factor – Financing Attribute	SI
The Inflation rate	0.89
Currency exchange rate	0.89
High equity to debt ratio	0.83

The factors that respondents considered to be critical under the financing attribute are shown in Table 12. The inflation rate affects the cost of money as it affects interest rates. The currency exchange rate is significant, especially in cases where lending is done in a different currency to the local one. The availability of foreign currency as well as the exchange rate is significant in reviewing the viability of the project and ultimately ability to borrow project finance.

Table 13: Critical success factors (the political and economic attributes)

Critical Success Factor – Political and Economic Attributes	SI
The political and economic stability of the country	0.92
An Effective market for the project outputs	0.88
The Social acceptability of the project	0.82

There were three factors found to be critical for accessing project finance under the political and economic attribute. The most significant of the factors was the political and economic stability of the country. This is expected as the level of certainty or uncertainty in a country usually rests on these two factors. This is consistent with the literature; for example, Ameyaw et al. (2017) emphasised the importance of political commitment from elected leaders toward PPPs. Studies by Sharma (2012) show that macroeconomic stability, quality of regulation and governance are important factors in determining PPP in the infrastructure. While, Wibowo and Alfen (2015) emphasised the importance of clearly defined mechanisms of PPP needs and strong political support; Al-shareem and Yusof (2015) emphasised the importance of market readiness and environmental uncertainty; political support and stability (Alteneiji et al., 2019); political support and acceptability for PPPs, positive government attitude towards private sector investments (Osei-Kyei and Chan, 2017 (a)); and stable macro-economic environment (Ahmadabadi and Heravi, 2019).

Table 14: Critical success factors (the Special Purpose Vehicle attribute)

Critical Success Factor – Special Purpose Vehicle Attribute	SI
The Resources available in the project company	0.83
The level of project management experience	0.83
The level of Management skills in the project company	0.83
The Reputation of the project company	0.82
The Financial strength of the company	0.82
The legal structure of the project company	0.80
The Quality of subcontractors	0.80
Familiarity with industry and client	0.75
The Size of the company	0.72
Existence of Special Purpose Vehicle	0.72

There were ten factors under the SPV attribute that were found to be critical in the ability to access project finance in Zimbabwe. It is interesting to note that although considered significant, the existence of an SPV ranks lowly compared to other factors under the SPV attribute. It may be because many of the respondents are from organizations where the use of SPV is very limited or not done at all, for instance, local authorities and parastatals.

5. Limitations of the research

The size of the sample in this study was a major limitation. The participants who completed the questionnaires were chosen by the organizations approached. The researchers did not have an in-depth knowledge of these participants only the information about themselves that they provided on the questionnaire. This is a limitation in that it assumes competence in project finance that may not be at the level of expert. The Cronbach alpha values for interrater reliability for aggregate project attributes, political and economic attributes were questionable. As a result, some of the factors under the said attributes were not included in the conclusions. However, these factors are critical, and their exclusion diminishes the value of this study.

Several factors that ranked high on the significance index were not considered in the conclusions because they failed the interrater reliability test. There is a need to investigate these factors with a different group of experts to avoid the study being affected by history. The size of the sample must also be expanded to achieve a higher level of representativeness than achieved in the current study.

6. Conclusions

The economic condition in developing countries is an important factor in the ability to access project finance. The results of this study confirmed this. Macroeconomic conditions within a country determine the inflation rate, interest rates and other economic factors which have a direct bearing on lending and investments in that country. This study also concluded that the legal environment of a country has a bearing on access to project finance. Investors and lenders prefer to go to countries where there is a strong legal framework that is enforced. The respondents in this study agreed that this was an important factor in accessing project finance. While the legal systems in Zimbabwe are sound, they are not always applied consistently to provide confidence in their impartiality. Almost all the factors investigated in this study regarding access to project finance were found to be important. However, some of the factors could not be included in the conclusions to this study because of the poor interrater reliability values. The developing countries, as represented by Zimbabwe, have a huge potential to improve their economies and the well-being of their citizens. Infrastructure is an enabler in this endeavour, and all efforts must be made for its provision. A total of 33 factors under five attributes were identified: governmental, financing, project, special purpose vehicle, and politics and economics were identified as being critical for accessing project finance. These factors were ranked according to their significance index or importance. Only 12 factors were considered as extremely important as critical success factors for project financing in Zimbabwe.

The critical success factors list will assist governments in determining what the private sector requires before participating in government infrastructure projects. These factors will also assist financial institutions in making financial decisions when investing in public infrastructure projects.

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Construction Subcontracting Policy Framework for Developing Local Contractors Capacities in Zambia

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Abstract

The Zambian construction industry, like many developing countries has over the past years experienced an imbalance in the distribution of works between local and foreign contractors. In a bid to bridge the gap, the Government of the Republic of Zambia in 2012 introduced a policy on subcontracting which provided for mandatory subcontracting of 20% of all major contracts to local contractors. There has however been outcries from subcontractors that the policy has not been beneficial. The study sought to investigate subcontracting practices in order to develop a framework for building capacity for local contractors within the construction industry in Zambia. The objective of the study was to explore the regulatory requirements on subcontracting in Zambia and establish the 20% subcontracting policy inadquescies . The study adopted the mixed method approach in which both semi-structured interviews (main contractors, sub-contractors consultants and project owners) and survey questionnaire were adopted for primary data collection. The questionnaire was distributed to 70 respondents and a response rate of 71% was attained. The investigation was conducted on 40 projects implemented in Zambia between 2012 and 2015. The study established four major deficiencies of the policy which include: subcontractors do not participate early in the procurement process and are introduced after contract is awarded; no clear guidelines on the implementation of the policy; subcontractors do not take part in determining works; and it is difficult to grow capacity of local contractors using the 20% subcontracting policy because contractors engaged to be main on projects do not show interest in developing and building local contractors capacity due to lack of incentives. A framework was developed that can be used to meet the study objectives and that of the policy in sucbcontracting and reduce the current inadequacies. The studyrecommended the use of the proposed framework by the government to reduce the current gaps.

Keywords: Construction industry, Developing capacities, Local contractors, Subcontracting, Zambia

1. Introduction

National economies develop with a thriving construction industry as it is a very significant industrial sector. . Mwanaumo et al. (2018) cited Deloitte (2018) highlighting that at global level, the industry is very enormouse and was valued around USD $17 trillion in 2017 and is expected to grow to USD 69.4 trillion by 2035. Additionally, the contribution of the contruction industry at global level in relation to the gross domestic product (GDP) is estimated at 15% of the GDP in 2020 (PricewaterhouseCoopers, 2013) and is expected to increase by 3.9% per annum to 2030 (PricewaterhouseCoopers, 2017). In South Africa, the construction industry is significant and contributed 3.9% of the countries' GDP in 2017 according to the PricewaterhouseCoopers (2017) as cited by Lekula (2018) and contributes 11% of employment (Construction Industry Development Board (CIBD), 2018). In the recent past, the construction industry in Zambia contributed about 10.6% of the Zambian GDP in 2016 compared to 9.9% in 2014, indicating an increase in activity in the development of infrastructure in the country, according to the KPMG 2017 cited by Mwnaumo et al. (2018).

The construction industry in Zambia has however been monopolised by contractors of foreign origin who are aquivalent to 20% of contractors registered, yet having a market share in excess of 80% in contract value as noted by the National Concil for Construction (NCC) (2018). This dominance is attributed lack of adequate capacity

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local contractors according to the report by the Ministry of Works and Supply (2018). To respond to this challenge, the Zambian Government adopted a requirement on the subcontracting of all public works in 2012(NCC, 2014) which saw the increase in the contract sum threshold from 10% to 20% of major constructs in the country; . The aim of the 20% policy threshold in subcontracting was to empower local contractors in order to build their capacity and also to creat jobs (National Council for Construction and Zambia Institute for Policy Analysis and Research, 2017).

According to Kulemeka et al. (2002), the existing variances disables local contractor capacities in relation to registration according to institution requirements And in the recent years, Zambia has seen major construction works that are capital intensive hence are limited to contractors who are in higher grades based on the contractors' classification system in Zambia as highlighted by National Council for Construction (2018) and the National Road Fund Agency (NRFA) (2015) and Conferring to the NCC (2018), local contractors registered in Grade 1 and 2 are only 34% of the total contractors registered, implying that foreign contractors take the remaining 66%. . This eliminates most of the local contractors in participating to procure major construction works since a large number of them are registered in lower categories.

Nonetheless, despite the introduction of the policy, subcontractors, who are the intended beneficiaries, have complained that this policy had not been implemented well and is not beneficial to them (Daily Nation, 2018; Zambia National Broadcasting Corporation, 2015). There has also been little documentation on subcontracting practices in Zambia. This study however, focused developing a manadatory subcontracting practice framework that would help in capacity building of local contractors in the Zambian construction industry. It was thus important to assess the existing subcontracting regulatory framework in Zambia , inaguarate inadequacies of the mandatory 20% policy manadatory to develop the local contractors' capacities in, then recommend improvements that would culminate into the development of a framework in subcontracting for development of capacity for local contractors. The results will benefit the Zambian government in making policy improvements on the 20% subcontracting policy. It is envisaged that the study findings would add to the construction industry body of knowledge in relation to subcontracting of local contractors.

2. Literature Review

Hoban and Francis (2010), defines subcontractors as being specialists hired by main contractor to perform specific tasks on a project as part of the overall contract. It has been generally accepted that subcontractors play a significant role in the execution of construction work (Akanni & Osmadi, 2015; Abbasianjahromi, et al., 2013; Hoban & Francis, 2010). The general contractors' performance is strongly dependent on subcontractors (Albino & Garavelli, 1998). Mbachu (2008) reinforced this notion and stated that the ability of the general contractor and consultant to deliver the project within time, quality and cost depends largely on the performance of subcontractors. Additionally, the contribution of subcontractors in construction works can be more than 50% while in some sectors it can be as much as 90% of the total project value (Kumaraswamy & Mathews, 2000). According Arditi and Chotibhongs (2005) subcontracting has proved to be efficient and economical in the use of available resources. They argued that qualified subcontractors are usually able to perform their work specialty more quickly and at a lesser cost than the general contractor. It is also noted that subcontracting can improve quality of work and reduce project time and costs (Ng, et al., 2008).

Kulemeka et al. (2015) in their study posit that what prevents performance of local contractors are economic related in nature and concluded that local contractors remain unsustainable and their performance unsatisfactory if governments do not intervene. They further added that in order to address the challenges faced by the Malawian local contractors , the review of policies by the governmebt for the development of small scale contractors programmes ensures that local contractors contribute to the growth of the economy..

While there are ethical issues to be considered in the construction industry, the Transparency International (2005) notes that the industry is classified as the most fraudulent industry worldwide. Studies carried out in various countries such as United States of America (USA) (FMI/CMAA, 2004; Jackson, 2013), Australia (Vee & Skitmore, 2003), South Africa (Pearl, et al., 2005), and Hong Kong (Fan & Fox, 2005) provide evidence that the construction industry is plagued with ethical issues due to its substantial capital investments (Adnan, et al., 2012). Additionally, Adman et al. (2012) stated that unethical practices can take place at every phase of a construction project, during planning and design, pre-qualification and tender, project execution and operation and maintenance. Such practices have been seen to result in projects which when completed, are considered unnecessary, unsuitable, overlay complex components, overpriced or delayed as postulated by Hamzah et al. (2010) Akintan and Morledge (2013) and Dainty et al. (2001). Within the Zambian construction industry, unethical issues arise from SME's tendency of selling their subcontracted portions back to main contractors (Muya & Mukumbwa, 2013).

Literature has shown that there is a general propensity of transmitting huge risks on the projects to small scale contracting firms whose capacity is inadequate to manage the risks (CIDB, 2013; Marzouk, et al., 2013; Laryea, 2010). This makes subcontractors uncertain of main contractors on their authenticity in the association. On the other hand, main contraintors are uncomfortable with subcontractors as they consider them to under employ or employ unskilled employees thus affecting the rate at which the works on site are implemented, thereby leading to conflicts. The subcontractor's lack of capacity is often used as an excuse for harsh conditions and terms leading to failure to meet project set objectives (Construction Excellence, 2004). Various studies to improve subcontracting practice from the point of registration, to selection and monitoring have been done (Ng, et al., 2008). According to Lew et al., (2012), most of the researchers focus on constituents that influence

subcontracting and on the development of new techniques that can be used for subcontractor selection or management . Kulemeka et al. (2015) notes that it is critical for governments to continuously review policies on contractor development programmes to ensure contribution to their success. While Yoke-Lian et al. (2012) indicated that effective subcontractor selection and monitoring would minimise the problems during construction. Additionally, Laryea (2010) emphasised that governments has a lot to do to enhance capacity for subcontractors to be involved in large projects through the creation of access to capital and improve structures.

2.1 Subcontracting policy, practices and challenges

Many countries are encouraging the promotion of SMEs who are mostly subcontracted, strive to industrialise and bring about economic development, for governments developing policies that encourage subcontracting (Hoban & Francis, 2010). The participation of local constructing firms as subcontractors to foreign firms is an important element in the concept of skills and technology transfer as well as building the capacities of local contractors (Abu Bakar & Tufail, 2012). Choudry et al. (2012) pointed out that as a deliberate policy, governments should formulate regulatory bodies to monitor the policy implemetation on subcontracting.

However, CIBD (2013) postulate that successful skills and technology transfer happens if both the main and subcontractors are on long-term strategic relationships, as most subcontractors are reluctant to share confidential information with other companies, especially financial information.

Wells (2000) postulates that the construction industry in Africa is characterised by extensive subcontracting, temporary and insecure employment, and poor working conditions. The CIDB (2013) study on subcontracting in the construction industry in South Africa, indicated that legislative and policy interventions around subcontracting should be aimed at improving the environment within which subcontracting takes place. In South Africa, various projects that are related to the public sector encourage the development of local economies by the adherence to set policies and regulatory requirements as can be seen in the targets set on the socio-economic front on training and development of skills, employment of the locals and the black economic empowerment , (CIDB, 2013). However, Mwanaumo et al. (2014) argued that contractors feel that such requirements on projects have worked well especially in creating employment, but are difficult to sustain in times of difficult economic climate where projects are hard to come by.

Cheng et al. (2011) in the research on evluating subcontractor performance proposed twelve (12) significant factors to be included in the subcontractor selection policy and concluded that trained input-output mapping relationship and subcontractor final scores should be used as key policy factors in building subcontractor capacity. However, Laryea, (2010) in the Ghana study on the evolution of indegenous constractors revelead that with the dominance of foreign contractors, local contractors lack capacity to carry out major projects and hence recommended the government to develop policies that would encourage local participation including subcontrating them in huge contracts to develop skills.

It has been argued that there is no common practice that is standard, in the formulation of subcontracting policy and each country comes up with its own framework based on the local factors, prime contractors, clients the other related policies that support subcontracting (Choudry, et al., 2012). They noted that some of the factors that could positively encourage local contractor capacity building should include technical and professional training through knowledge and skills transfer in financial, managerial, technical and technology transfer; efficient communication; evaluate roles and responsibilities for enforcement. This was also affirmed by CIDB (2013) and Martin (2010) who added that these factors should be guiding the subcontracting policy formulation and should aim at improving the environment in which subcontracting takes place, the contract forms and improve at management level the organisational aspects of the attached to subcontracting firms.

Thwala and Mvubu (2007) however, suggested that identification of local capacity is imperative for planning purposes in future projects. They also added that the usage of an integrated construction unit method of procurement helps in growing local contractors in economies such as that in developing countries. Kalemuka et al. (2015) and CIBD (2013) emphasised training at planning and design stage be incorporated for local contractors. While Muya & Mukumbwa (2013) proposed that a policy should have integrity improvements in the supply of equipment done by deducting costs at the beginning of certification, and consultants should approve payments to be executed by local contractors who are expected to be available for a particular period they are engaged. A similar notion was also attested by Abbasianjahromi, et al. (2013).

Nonetheless, though subcontracting is widely used in the developed world, it has been criticised to bring about challenges for the firm that is subcontracted and these challenges are mostly common in developing countries than in developed countries according to Mlenga (2002). The Zambian 20% subcontracting policy features provide for empowering and capacity building of local contractors, , employment creation for Zambian people and mandatory subcontracting of 20% of the contract sum be allocated to local contractors on all public projects awarded to foreign contractors. However, Zambia has been experiencing challenges to implement the policy requirement (Kaliba, 2015). Kaliba (2015) pointed that the 20% subcontracting policy is not legally supported as it has not been passed through parliament for ratification and has no existing guideline for implementation, while main contractors are uninterested in helping local contractors, and there is evidence of poor planning to help the local contractors build capacity in managing subcontracted works. While Choudry et al. (2012) noted that knowledge sharing is very power between main contractors as they prefer to continue enjoying the monopoly.

Several challenges have been highlighted from subcontracting firms by the CIDB (2013) and range from lack of security payment, weak management practices, poor attitudes, skills shortages, lack of working capital and failure to meet up with the competition from low

barriers to entry. These challenges inhibit subcontractors to grow their companies and move to a higher grading system, and thus fail to execute quality work. However, some improvements to the subcontracting policies in countries were similar or related policies have been adopted have suggested review of the policy if its not working (Abbasianjahromi, et al., 2013). This was also affirmed by Kaliba (2015) though he noted that even if the policy can be reviewed, the client needs to have a long term plan on assisting local subcontractors in capacity building to meet deliverable milestones.

3. Research Methodology

The study sought to examine practises in subcontracting to develop a framework of capacity building for the Zambian local contractors within the construction sector. The study adopted the exploratory mixed method approach in which semi-structured interviews and a survey questionnaire were used. Only 26 out of the targeted 30 stakeholders participated in the interviews to obtain an in-depth understanding (Creswell, 2014) of the subcontracting practices in Zambia. The target group included management of subcontractors, main contractors, clients and consultants. Data was captured through audio recording and note taking and was analysed using thematic analysis. Purposive sampling was used because it purposely targets a group of people perceived to be reliable and useful to inform the field survey questionnaire (Creswell, 2014) which was pretested for validity. A sample size of 70 was adopted for convenience of which a total of 50 questionnaires were successfully completed giving a response rate of 71.4% and hence acceptable (Creswell, 2014). The distribution was as presented in Table 1.

Table 1: Questionnaire distribution per project and category of respondents

Group	No. of projects	No. distributed
Clients	5	10
Consultants	3	20
Main Contractors (Grade 1 to 3)	8	10
Subcontractors (Grade 4 to 6)	24	30
Total	40	70

The structured questionnaire survey was based on the 40 projects implemented between 20th March 2012 and 20th April 2015 and targeted foreign contractors, local contractors, consultants and clients. Clients included technical persons working for Government Ministries and Agencies. Consultants were drawn from member firms of the Association of Consulting Engineers while contractors were drawn from organisations registered with the National Council for Construction (NCC) (2014) in category B, C and R and grades 1 to 6 which was biased to road and building construction sectors. The study respondents rated the statements using a 5-point Likert scale of 1 to 5. The results from the survey questionnaire was analysed using descriptive statistical techniques while Microsoft Excel Spreadsheets and Statistical Package for Social Science (SPSS) Version 26 were used as tools.

4. Results

The following are the results from the survey questionnaire approach:

4.1 Category and Grade of Companies' registration

This section of the findings presents information on characteristics of the respondents who were contractors. The results represent the contractors in the Building (B), Civil engineering (C) and roads (R) categories. These are recipients of the many public contracts related to the construction of scools and hospitals, health posts, roads and bridges. The highest percentage of the respondents at 27% came from the category 4R followed by the category 1R at 22%; the category 6R at 14%; the categories of 1B, 1C and 6B were at 9% and, lastly, those in 5R and 5B categories were at 5%. The distribution of contractors according to categories and grades obtained from NCC is presented in Table 2.

Table 2: Category and Grade of companies' registration

Category and Grade of companies	Percentage of Respondents
1R	22%
4R	27%
5R	5%
6R	14%
1B	9%
1C	9%
5B	5%
6B	9%

4.2 Contractual arrangements

The proportion of respondents who had been involved in traditional contractual arrangement was 71% followed by those who had been involved in the design and build at 16%. The third common arrangement was the Integrated Construction Unit (ICU) which accounted for 10% while 3% had experience in the Management Contracting method. Table 3 represents a summary of the findings.

Table 3: Results of respondents based on contractual arrangements

Contractual arrangements	Percentage of Respondents
Traditional method	71%
Management contracting	3%
Design and Build	16%
Integrated Construction Unit	10%

On the preference of the contractual method for the subcontracting policy, it was established that 48% of the respondents favoured traditional methods of procurement while 45% were of the view that the management contracting method would be better in implementing the policy. However, 5% and 2% preferred integrated construction unit, and design and build method respectively.

4.3 Analysis on implementation, constraints and improvements to the policy

The respondents were asked to rate statements concerning the mandatory subcontracting policy on a Likert scale of 1 to 5. A total of 46 statements obtained from preliminary interviews and literature review were adopted for this study. The nine statements relating to inadequacies of the mandatory subcontracting policy were established and included "the 20% subcontracting policy is not legally supported as it did not pass through parliament for ratification; and difficult to grow capacity of local contractors using the 20% subcontracting policy as main contractors are not interested in building capacities of local contractors due to lack of incentives".

Other statements include "the lack of strategic plan on subcontracting makes it difficult to build capacity of local contractors, no participation of subcontractors in the determination of work; and main contractors want to retain maximum benefits, thus reluctant to subcontract". Additionally, main contractors are not willing to impart skills on subcontractors in order for them to continue enjoying the monopoly; lack of local contractor capacity infringes on main contractors to build capacity for local contractors ; there are no clear guidelines on the implementation of the policy. Lastly, subcontractors do not participate in the procurement process and are only introduced after contracts are awarded. These statements are similar to the ones in the literature reviewed such as by CIBD (2013), Kulemeka et al. (2015), Kaliba (2015), Mbachu (2008), Abbasianjahromi, et al. (2013) and Thwala and Mvubu (2007).

4.3.1 Inadequacies in the 20% mandatory subcontracting policy

The statements submitted by respondents were analysed with respect to the 20% subcontracting policy inadequescies. The results show that out of the nine statements, six had a man mean score greater that 3.5 . The descriptive statistics are presented in Table 4 indicting that there were dissimilarities in the way respondents alleged the existing inadequacies of the mandatory subcontracting policy by different construction practitioners in Zambia.

Table 4: Descriptive statistics of inadequacies in the mandatory subcontracting policy

No.	Statement	Mean score	Variance	Mean score > 3.5
1.	The 20% subcontracting policy is not legally supported as it did not pass through parliament for ratification	3.39	2.021	-
2.	Difficult to grow capacity of local contractors using the 20% subcontracting policy as a result of lacking interest by main contractors in local contractor capacity building due to lack of incentives.	3.64	1.801	Yes
3.	Lack of strategic plan on subcontracting makes it challenging to build local contractors capacity.	3.89	1.445	Yes
4.	No participation of subcontractors in the determination of work	3.81	1.815	Yes
5.	Main contractors want to retain maximum benefits, thus reluctant to subcontract	4.20	1.672	Yes
6.	Main contractors are not willing to impart skills to subcontractors so as to continue enjoying the monopoly	3.48	2.211	-
7.	Lack of capacity of local contractors make it difficult to build capacity of local contractors by main contractors.	3.00	1.745	-
8.	No clear guidelines on the implementation of the policy	3.67	1.546	Yes
9.	Subcontractors don't participate in the procurement process and only introduced after contract is awarded	4.10	1.635	Yes

The statements from Table 4 were further analysed in order to identify those which were either important or very important. The cut off point for the mean score was set at 3.5. Out of the nine statements, six were found to have a mean score greater than 3.5. After taking a standard t-test it was found that only four statements were statistically significant ($p<0.05$) and they include: subcontractors don't participate in the procurement process and only introduced after contract is awarded; and no participation of subcontractors in the determination of work. The other two are: no clear guidelines on the implementation of the policy, and difficult to grow capacity of local contractors using the 20% subcontracting policy as there is disinterest in capacity building of local contractors by main contractors because of lacking incentives.

4.3.2 Improvements to the 20% mandatory subcontracting policy

The results from this part of the questionnaire were analysed with respect to respondents' perception on possible improvements to the implementation of the subcontracting policy. The initial stages of the analysis used descriptive statistics and the results are presented in Table 5.

4.4 Interview results

The purpose of the interviews was to obtain an in-depth understanding on how the various stakeholders in Zambia view 20% subcontracting policy. The interviewees agreed that "work allocation has to be done by the engineer/consultant at design stage instead of foreign or main contractors in order to remove bias". The subcontractors indicated that they needed to be involved in work allocation.

On establishing the common methods of engaging contractors, the interviewees stated that "it would be difficult to achieve the objective of empowering and creating jobs for the local contractors if main contractors were left alone to engage subcontractors". Prefernance on the nominating of clients was justified that "it would enhance fairness and reduce the cases of main contractors buying off subcontracts whilst pretending to have subcontracted".

On awareness of the subcontracting policy, the results showed that generally the respondents understood the main features of the 20% subcontracting policy. Over 90% of the interviewees stated that the main features of the subcontracting policy included:

(i) Mandatory subcontracting of 20% of the contract sum to local contractors on public projects provided the contract sum was above Thirty Million Kwacha and contract was awarded to a foreign contractor;
(ii) Building capacities and empowering local contractors; and
(iii) Fostering employment creation for the Zambian people.

To assess if the policy addresses the interests of both main and subcontractors, about 76% indicated that the current policy does not support the interest of contractors and their subcontractors. However, when asked about the functionality of the laws in the construction sector, majority of the respondents, 64%, were affirmative while 36% were not sure.

To establish challenges in implementing the subcontracting policy, the data was recoded and analysed qualitatively. The main reasons, in order of importance, attributed to the policy's failure to meeting the interests of the main and subcontractors included:

(i) Lack of interest by Main foreign contractors to build capacity of local contractors;
(ii) Main contractors view subcontractors as potential competitors;
(iii) Main contractors not willing to subcontract 20% of the contract sum;
(iv) Main contractors allocate low value works to subcontractors so that they maximise profits;
(v) Lack of experience, personnel, equipment and poor financial resources among local subcontractors;
(vi) Insufficient capacity in project management among subcontractors inhibits the possibility of subcontracting 20% of huge or high value projects.

Table 5: Descriptive statistics of constraints to the subcontracting policy

No.	Statement	Mean score	Variance	Mean score > 3.5
1.	Reviewing the current policy on subcontracting so that is can include supporting and key sectors considered significant in the construction industry.	4.59	0.455	Yes
2.	Need for the client to strategically plan on local contractor capacity building through deliverables that are attainaible e.g. upgrading in every 3 years, at least 10 Grade 1 contractors.	4.50	0.511	Yes
3.	Identification of local contractors by clients who have the capacity to develop so that they can be placed in 5 years deliberate programmes.	4.12	1.110	Yes
4.	Using Interated Construction Unitmethod of procuring works done by local contractors for them to grow.	4.16	0.723	Yes
5.	Training identified local contractors by consultants based on the works identified.	4.00	1.333	Yes
6.	Client to procure equipment from suppliers for the identified local contractors and start deducting the cost through interim payment certificates for a medium term period	3.76	1.730	Yes
7.	Consultants approve payments made by local contrators identified	4.10	0.802	Yes
8.	The project design to include identified local contractors training	4.18	0.653	Yes
9.	Ensure the availability of work for a period of 3 years for all identified local contractors.	4.14	0.833	Yes
10.	Provision of development of skills and employment with main contractors continues in other related projects	4.27	0.883	Yes

5. Discussion

The study identified four major inadequacies of the 20% mandatory subcontracting policy. The first one relates to non-participation of subcontractors in the procurement process as they are introduced onto the project after award of contract to the main contractor. This inadequacy was also similar to the insufficiency that was highlighted by Hoban and Francis (2010) in their study on improving the relationship between contractors and subcontractors. The second inadequacy relates to non-participation of subcontractors in the determination of work. This was also highlighted as a major concern in the procurement system of subcontractors and considered a major challenge in traditional procurement method (Mwanaumo, et al., 2014; Akintan & Morledge, 2013) culminating to inappropriate periods of activities that critical at projects duration of critical activities. However, the study found that adequate and broad view of information about the works was not properly done, thereby increasing programme failure possibilities and leading to project delays (Hoban & Francis, 2010; CIDB, 2013). To avert this inadequacy, it would be necessary to engage subcontractors during the design stage, a sentiment which was shared by Ng et al. (2008) . The awareness level in technical professional subcontracting was found to be high from clients, consultants and contractors, and a similar result was affirmed by Akanni and Osmadi (2015) that such subcontracting was widely used.

The study also established the third inadequacy that lack of clear guidelines on the implementation of the

policy was one of the major deficiencies of the mandatory subcontracting policy as applied in Zambia. CIDB (2013) underscored the importance of legislation and policy interventions around subcontracting firms in a bid to improve the environment within which subcontracting takes place. In the absence of clear guidelines, policy implementation would be a challenge and subject to individual interpretation (CIDB, 2013). Policy should be accompanied by clear strategies on building local contractors capacities. The strategy must be clear as how many local contractors have to be upgraded according to the NCC classification (NCC, 2018). This relates to Kulemaka et al. (2015) on the notion that proving an environment that empowers an small subcontracting firms include the elimination of entry to market barriers , growth and sustainability.

The fourth inadequacy established that the 20% subcontracting policy made it futile for local contractors to build capacity because thare was lack of interest by main contracors to assit build capacity attributed to due to lack of incentives. This finding relates to the adversarial relationship which exists between main contractors and subcontractors. The findings agree with Kaliba (2015) and Choudry et al. (2012) whose assertion was based on unconcerned main contractors in developing local contractors subcontracted under them.

Main and subcontractors operate with the conflict theory which emphasises the presence of conflicting forces in society, social structures, groups and individuals generally (Abbasianjahromi, et al., 2013; Akintan & Morledge, 2013). The theory perceives the society of humans as a gathering of interest groups and individual that are competitive with each other in relation to motives and expectations. However, this was non affirmative from the study which established that the Zambian construction industry's main contractors are not willing to subcontract their works.

Subcontractors can therefore be enganged through nomination by clients. However, Yoke-Lian et al. (2012) and Laryea (2010) difficulties are attained when striving to empower and create jobs for loal contractors whenever main contractors are engage subcontractors on their own.The study disclosed that preference in the nomination of subcontractors by clients enhances fairness and reduces the cases of main contractors buying off subcontracts whilst pretending to have subcontracted. The study findings is affirmative with that of Mwanaumo et al. (2018) in which subcontracts were alleged to be bought off by main contractors. Hence, it is logical to conclude that, once main contractors were left alone to implement the policy in its current state, very few subcontractors would be engaged.

Improvements and modifications to the policy enables mandatory subcontracting policy reviews that includes all other sectors in the Zambian construction industry in order to empower and create jobs for local contractors. This is in line with Kumaraswamy and Mathews (2000) who avowed that the contribution of subcontractors in other sectors of construction is more than 50% and as much as 90% of the total project value to a construction process.

Other improvements include the identification of local contractors with potencial for growth under a deliberate programme; using Interated Construction Unitmethod of procuring works done by local contractors for them to grow.; training identified local contractors by consultants based on the works identified.; and Consultants approve payments made by local contrators. These relates to findings by Thwala and Mvubu (2007). The study also gathered that at project design, training of local contractors be included; ensuring that works are made accessible in not less than 3 years for local contractors identified; and the continuation of skills development and employment in other projects subcontracted by main contractors for the identified local contractors and are in line with CIDB (2013).

The study established that empowering and developing capacities of small scale contractors involves strategic planning on the part of government. The findings on this study conforms with the findings of Kulemeka (2015) who established that the comprehensive and detailed planning processes with set quantitative and qualitative targets guide implementing institutions. However, Thwala and Phaladi (2009) stated in their study that significant lessons can be drawn from those initiatives that have been done before such as advocate the interest of emerging contractors and ensure that policies and procedures in the construction industry create an environment conducive to the development and promotion of emerging contractors; increase the participation of emerging contractors in construction activities; substantially increase the emerging construction enterprises share of work opportunities within the public sector. Additionally, several proposals were made to develop a subcontracting policy framework as a starting point and a means to develop local contractors' capacities so that they can participate major contracts implementation in the country. This was the basis and one of the main study objective.

5.1 Development of the subcontracting policy framework

The study established that the majority of construction companies in Zambia are small scale in nature. Thwala and Phaladi (2009) mentioned in their study that one success factor was not effective to the success of small scale contractors unless different factors are considered to ensure that the capacity is developed in the local contractors, a model was developed.

The subcontracting framework was developed to ameet the objectives of the 20%the 20% mandatory subcontracting policy as illustrated in Figure 1. The key stakeholders involved are: the client (public, private or quasi-government), the consultant (engineers, architects, and quantity surveyors), the equipment suppliers or key material suppliers, commercial banks and financial institutions, the main contractors and the subcontractors. The framework is in two ways, firstly the client can make a preliminary assessment whether or not proposed project can be used for capacity building program. And secondly, if a project is useful for capacity building, the client proceeds with the procurement of a design and supervision consultant whose responsibility includes: designing of the project; preparation of project specifications as well as work breakdown packages for the subcontractors; and project supervisionThe consultant can

then allocate a prime cost sum to identified works for subcontracting and then propose the equipment and key project materials required for the subcontracting works.

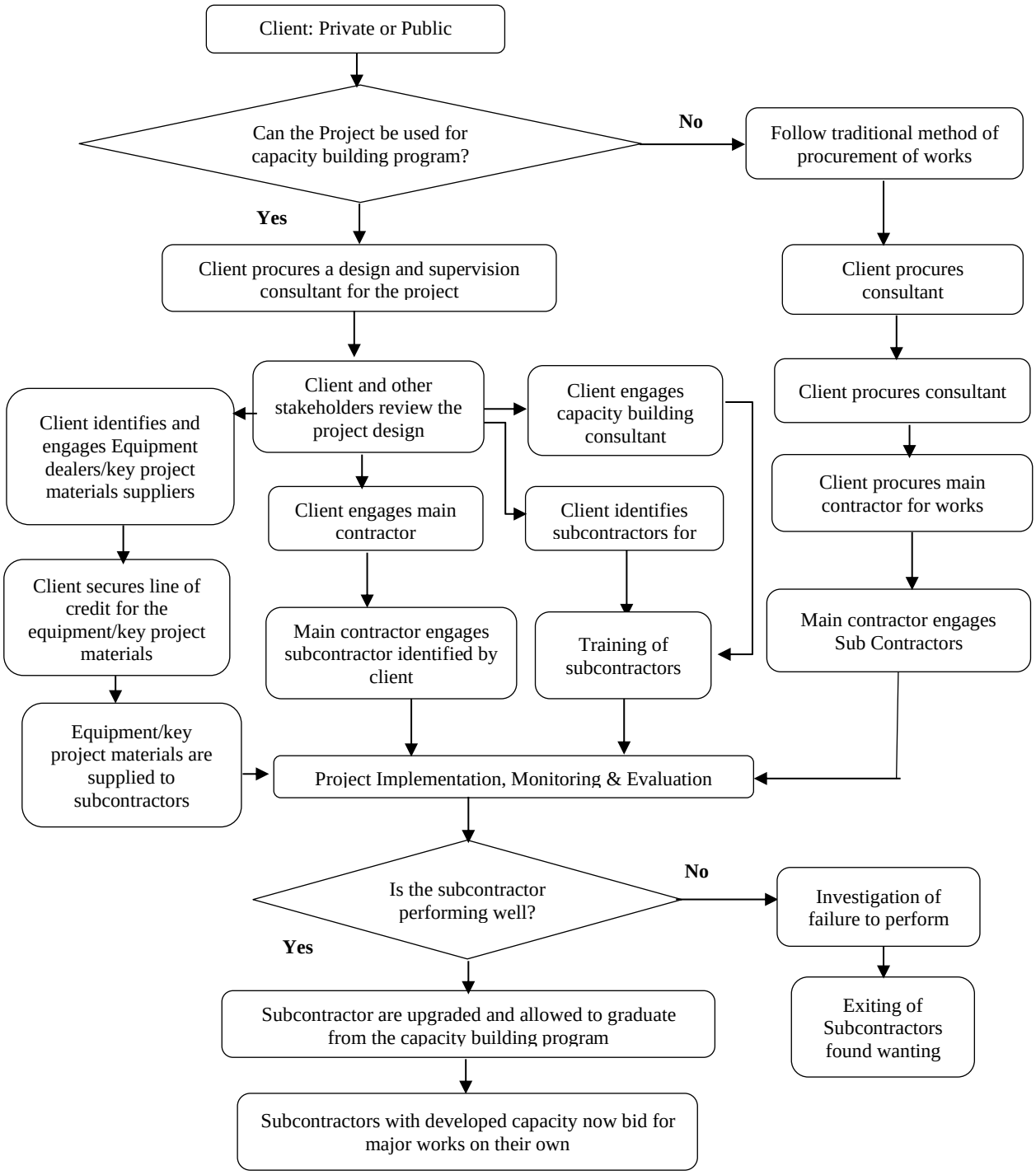

Figure 1: Subcontracting framework for capacity building

Key points regarding the proposed framework include: the client would provide advance payment to subcontractors to kick start the subcontracting works; a meeting would be set up for all the stakeholders involved to explain the roles and responsibilities of all the parties to the contract; during the project implementation process, the cost of the procured equipment/key project materials would be deducted proportionately through the interim payment certificates (IPCs); the authorisation on the use of funds would not be left to the subcontractors alone; the client would guarantee contracts for the earmarked subcontractors for the project duration to ensure that the equipment and or key project materials procured during this time would be paid for by the subcontractors from proceeds of the project.

5.2 Stages and roles of the stakeholders in the framework

The client is the employer of the project team members. The client has the responsibility of empowering and building capacities of its citizens. The client will have the overall responsibility and control of the project. The client will have to assess initially if the project can be used for capacity development of subcontractors or not.

The consultant is responsible for designing and supervising the works. The consultant would be responsible for allocating works for subcontracting at design stage. Works to be subcontracted would be reviewed together with the client and other stakeholders upon completion of the designs by the consultant. At this stage, comments on work allocation are added. The consultant's overall responsibility is of delivering the project.

The capacity development consultant is responsible for supervising and providing training to the subcontractors. The training package include technical and financial management while subcontractors will be encouraged to maintain qualified personnel. The capacity development consultant would advise and report to the client on all matters relating to subcontracting and capacity development of subcontractors.

This stage shall be used to review the designs and works allocated to subcontractors. The stakeholders involved in the review process include the capacity development consultant, design consultant, client and any other stakeholders relevant to the capacity development programme. This stage would eliminate the allocation of low value works to subcontractors.

The client will issue the expression of interest for local contractors. Then the client will have a list of local contractors according to their specialisation. Capacity development criteria would be developed in order to shortlist the local contractors. The subcontractors for capacity development programme would then be nominated from the list of approved local contractors.

The equipment/key materials suppliers will provide materials, equipment and back up spares to the subcontractors through the projects. The suppliers of equipment will provide on-site service and training to subcontractors' personnel for sustainability purposes. Key materials like cement, steel, fuel, bitumen, aggregates to mention but just a few would provide reasonable boost to the implementation of the project by the subcontractors who are usually financially week compared to major foreign contractors.

The role of main and subcontractors would be to deliver the project according to the specifications to the client. The subcontractors will have a duty to learn and develop their technical and financial management skills from the main contractors and consultants.

The scope of works for subcontractors will be well defined in the contract documents. The contracts will also provide the criteria on how performance and quality required for the works will be measured, the methods for performance measurement and the acceptance. The terms and conditions for subcontracting will be included in the contract documents, especially payment terms, retention, advance payment bond, defect liability period and liquidated damages.

The monitoring of the subcontractors and the project would be carried out for purposes of checking progress and evaluating the capacity building programme. The evaluation would also be carried out to assess which subcontractors would graduate from the programme. The process would also be used to reassess those subcontractors failing to perform. Performing subcontractors would be recommended for upgrade according to NCC grades and categories. At the end of the project, it is expected that some subcontractors would have been capacitated and upgraded. The upgraded local contractors would then be assisted to tender jobs with high values especially those who will be in Grades 1and 2.

6. Conclusions and Recommendations

The paper examined the mandatory 20% subcontracting policy in the Zambian construction sector. The policy was formulated to help bridge the gap between firms of foreign origin and indigenous contractors. Through this study, it was established that the current policy has four major deficiencies in as far as meeting the objectives of empowering and building capacities of local contractors is concerned.

The mandatory subcontracting policy operates within the traditional procurement realm where the main contractors normally engage subcontractors to carry out part of their contractual work based on the skill and capacity set which the subcontractors supposedly possess. This conflicts with the objective of the policy which emphasizes on the transfer of skills and building capacities of local contractors. Thus, even though the policy is in place, the implementation of this policy could be difficult. The study developed a subcontracting policy framework that would help build local contractor capacities in Zambia so that they can be able to participate in the construction projects.

It would therefore be imperative that the procurement and contracting strategies be modified if the objectives of the policy are to be met. The Government of Zambia should thus review the method of engagement, work allocation system and formulate clear guidelines on implementation of the policy. The procurement and contracting strategies should also take into consideration the ever present adversarial tendencies that exist between main contractors and subcontractors.

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