Original Research Article

Construction projectfailure and abandonment in Kaduna State, Nigeria.An analysis of the causes usingtheRelative Importance Index.

Abstract:
The construction industry serves as one of the key players of a nation's economic growth, considering its role in infrastructural development, revenue generation, provision of jobs and shelter for the masses, enriching the esthetical view and influencing the growth of other key sectors of a nation. In this research, a study was carried out on the causes of construction project failures and abandonment in Kaduna state, Nigeria. The study's objective was to identify the possible causes of failure and abandonment of construction projects and evaluate the identified causes in their order of importance. To achieve this, a quantitative research approach using questionnaires as an instrument for data collection in Kaduna state was adopted, usinga total of One Hundred (100) survey-questionnaires distributed among professionals and workers in the construction industry. Analysis of the data acquired from the returned questionnaires was done using SPSS v26 and MS Excel 2016 to obtain the descriptive statistics and the Relative Importance Index (RII). From the ranking, Corruption (RII = 85.9%), Change in government administration (RII = 82.8%), Politics (RII = 82.8%), Government policies (RII = 81.9%) and Inadequate involvement of construction professionals (RII = 81.3%) were the five top ranking causes of project failure and abandonment in the study area.The Spearman rho correlation showed some significant but low relationship among the variables, while the Kruskal-Wallis test indicated the same distribution of all the variables among the construction professionals. The research also revealed that although insecurity was a burning issue for the industry especially in the study area, its ranking showed that it was not considered a significant factor in relation to the other factors.

Keywords: Construction; project failure; abandonment; Relative Importance Index (RII); Kaduna state.

1.0 INTRODUCTION

The reoccurrence of failed and abandoned projects in Nigeria has become an issue of concern as huge investments end up being wasted. [1].

Construction plays an essential role in the economic development of developing countries with an effect on peoples' lives both directly and indirectly in areas such as job creation, socio-economic growth and provision of social amenities. [2]. Construction projects are meant to provide new products and services to the community and promote the beauty of the environment [3], [4]. Therefore its failure and abandonment does not only have detrimental effect on lives of the populace, a nation's development and economy but also the environment.

Based on the criteria of performance with reference to cost overrun, time overrun, quality and functionality, a construction project can be adjudged to be successful, failed or abandoned. A failed project is one that although completed, does not satisfy the end users [5]. An abandoned

project is one for which there is a huge time lag between suspension and resumption of work in so much that there is a loss and weakening of materials[6].

The history of construction projects' successes in Nigeria can only be said to be that of a modest achievement as a good number of projects across the country fail to attain 100 percent completion. Nigeria records about 60 percent failure owing to certain factors such as systemic failure, poor planning, and inefficient management [7].

According to the Guardian of 02 July, 2017 as reported by [8], the AkwaIbom Integrity Group identified a total of over 300 abandoned projects by the Niger Delta Development Commission (NDDC) in the state involving 121 rural roads, 75 classroom blocks, 69 rural water schemes and 43 mini-electrification projects.

In a related development, the Water Resources Committee in the Nigerian Senate uncovered over 400 abandoned water (dam) projects responsible for acute water scarcity across the country. The report further states that some of the dams were not properly cited while most of them had no utilization downstream[9].

In another development, the Senate joint Committees on Health, Primary Health Care and Communicable Disease, Works and Housing were tasked to investigate the abandoned N400 billion naira National Primary Health Centre Project. The projects were to be cited in each of the Local Governments of the Federation for which 100 percent of the project funds were already warehoused in one of the banks in the country[10].This reiterates the fact that construction failure and abandonments affects all sectors.

Several studies to identify the causes of project failures and abandonment have been carried out and ways on how to reduce this menace have been recommended, suggesting that the discourse around this subject is not new. However, Nigeria is still grappling with the issue of failed and abandoned construction projects. This shows the need for the continuous evaluation of the subject matter as this issue is a complex social problem where causes and solutions are ever changing and difficult to identify[11].

Construction projects are complex, take long time, and consist of numerous participants hence, involves a high of uncertainty and risk[12]. It is an industry that includes intricate processes and several distinct parties such as the construction professionals, clients, artisans, manufacturers, local communities, consultants, and others [13], [14]. Consequently, the success of any construction project depends largely on the successful coordination of these participants and processes.

Owing to the difference in geographical location and organizational operation, causes of construction project failures and abandonment differ from one region to another [15]–[17]. As stated by [18] and reported by [11], these factors are nebulous and differ from one company to another and one country to the other.

Ayodele&Alabi[19] in a research covering all the states in the south-western geopolitical zone of Nigeria identified the significant causes of project abandonment to include inadequate planning; inadequate finance; inflation; bankruptcy of contractor; variation of project scope; political factor; death of client; delay in payment and incompetent project manager. [20]considered corruption, inadequate estimation, lack of proper planning, unavailability of skilled personnel and communication gap among personnel. According to Hanachor[21] choice of project site or location, embarking on projects without needs analysis, lack of social analysis of a project, project imposition, improper financial analysis, underbidding of projects, lack of technical analysis were considered as the factors of community development project abandonment.

Ihuah&Benabo[17] identified payment delays, inadequate allocation of funds, leadership instability, demise of the investor/client/owner, inconsistent policies of government, poor project planning and design, improper project estimates, land or legal disputes, unjustified project aim, change of investment purpose, natural disaster, community interference, climatic conditions, increased material costs as some of these project abandonment factors.

A study in Imo, Abia and Rivers states revealed that non-comprehensive designs, ineffective monitoring, understanding of project's mission, project manager's technical knowhow, managerial support, political risks, ineffective procurement process, inadequate financing by the client, ineffective communication and information management were some of the causes of failure and abandonment of public sector construction projects in Nigeria [22].

Alao&Jagboro[23] in a study of Nigerian tertiary institutions in Osun state identified forty (40) factors causing project failure and abandonment. Factors considered significant were those having a mean score ≥ 3.20 on a Likert scale of 5. These factors include delayed payments, bankruptcy of contractor, inflation, fund mismanagement, inadequate budgetary allocation, inadequacy of finance, contractor's incompetence, death of client, under-bidding of projects, community interference, consultant inexperience, inconsistent government policy, pre-qualification procedure, variation of project scope, project manager's incompetence, political factor, inadequate cost control, inaccuracy of estimate.

Housing projects abandonment in AkwaIbom and Cross Rivers states in Nigeria was evaluated using the Relative Importance Index. it was concluded that the major factors causing project failure and abandonment include finance, lack of trust/accountability, professional incompetence, political factors and lack of stakeholders' involvement in project selection [4].

In Ghana, the results from a study showed that overall rankings for the causes of project abandonment in the order of importance were monitoring, corruption, political interference, change in government, bureaucracy, lack of continuity, fluctuation of prices, planning, delays in payments and release of funds[24].

A study on construction projects in South India,Jaihan&Suman[25], identified ineffectiveness in scheduling, planning, execution and monitoring, payment delays, low profit margin due to competition, improper resource allocation and utilization, fraud and briberies, inadequate financing by client, contractor's financial difficulties.

Factors identified as contributing to international development project failure in Afghanistan were, security issues and conflicts, corruption, political interference, ineffective monitoring, inappropriate selection of PM, poor project team formation, weak feasibility studies, inadequate project planning, poor recruitment and low capacity[26].

According to whileAdil et al.,[27], the causes of project failure and abandonment in Iraq include financial corruption, assignment of work to companies that have no experience in that field, and incompetent contractors. Another research identifies inappropriate project management, delay in decision making, poor scheduling, challenging security conditions, delay due to lack of materials, financial corruption, unforeseen poor economic conditions, the owner faces financial difficulties, among others as the factors of construction project failure in Iraq[28].

Kaduna, one of the northwestern states in Nigeria has been bedeviled with serious security problems (insurgency, banditry and kidnapping). This has led to the crumbling of several economic activities in many parts of the state. According to reports, most developers abandoned their sites owing to this very challenge as experts expressed concerns over been adopted and

ransoms requested[29]. This research seeks to explore this existing gap as well as contribute to extant literature on project failureand abandonmentusing the perspectives of construction professionals in Kaduna State.

2.0 Research methodology

2.1 Questionnaire Design

The data employed in this study was obtained by means of a questionnaire survey. The structured questionnaire contained questions designed using a four-point Likert scale (i.e. ratings from 1 to 4). Based on related research, the survey considered 10 factors. The questionnaire consisted of two parts. The first part was for the general information about the respondents. The second part was for the information concerning the factors causing construction project failure and abandonment in the study area. A total of One Hundred (100) professionals with different backgrounds including architects, surveyors, engineers, builders, etc were targeted.

2.2 Data Analysis

Descriptive analysis of data (the frequency mean and standard deviation) obtained from the returned questionnaires was done using the Microsoft Excel (MS Excel) package version 16 and Statistical Package for Social Sciences (SPSS version 26). These tools were employed in the analysis as they are the mostly available statistical tools used for analysis.

Out of the One Hundred (100) questionnaires, distributed, eighty (80) were returned. For a target population of 100, a sample size of 80 is required[30].A Likert scale rating from 1 to 4 was adopted, where 1 stands for "strongly disagree", 2 for "disagree", 3 for "agree" and 4 for "strongly agree".Reliability of thesurvey questionnaire was analysed for internal consistency. Spearman'srho correlation was also done to determine the degree and direction of association among the items. The Relative importance index (RII) was used to rank the factors causing construction project failures and abandonment according to their importance. This method has been used by several researchers in construction to rank different variables such project delay factors, [31], risk assessment [32], labour productivity, [33]. The RII (expressed in percentage) was calculated using the equation below

$$RII\ (\%) = \frac{4n_4 + 3n_3 + 2n_2 + 1n_1}{4[n_4 + n_3 + n_2 + n_1]}\ x\ 100 \qquad (1)$$

Where,

n_4 = frequency of the "strongly agree" responses
n_3 = frequency of the "agree" responses
n_2 = frequency of the "disagree" responses
n_1 = frequency of the "strongly disagree" responses

3.0 Results and discussions

3.1 Results

3.1.1 Questionnaire response

The rate of questionnaire return is as shown in fig. 1. A total of One hundred questionnaires was distributed and a total of 80 was returned. This shows a response rate of 80%.

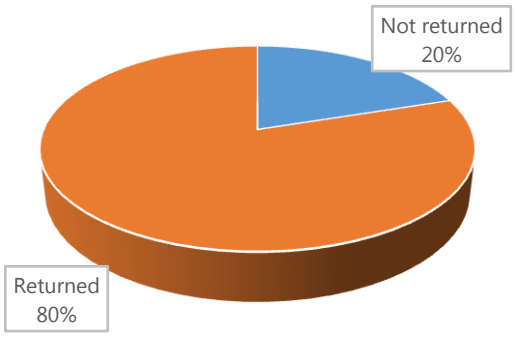

Fig. 1. Return rate of questionnaire

3.1.2 Respondents' profile

The demographic profile of respondents included gender, age, years of experience, professional background etc. This is represented in Table 1.

Table 1: Profile of the respondents

Demographic	*Characteristic*	*Frequency*	*Percentage*
Gender	Male	68	85
	Female	12	15
	Total	80	100
Age Classification	18-24	7	9
	25-35	31	39
	36-45	17	21
	46-55	13	16
	Unknown	12	15
	Total	80	100
Profession	Architects	15	19
	Project managers	3	4
	Contractors	6	7
	Builders	27	34
	Civil Engineers	16	20
	Others	13	16
	Total	80	100
Experience	0-9	37	46
	10-19	20	25
	20-29	14	18
	30-39	2	2
	Unknown	7	9
	Total	80	100

Table 2: Descriptive Statistics

		Corruption	Change in govt. admin.	Politics	Govt. policies	Inadequate involvement of professionals	Client's interference	Lack of professional ethics	Insecurity	Ineffective communication	Claims
N	Valid	80	80	80	80	80	80	80	80	80	80
Frequencies	SA (4)	39	36	36	31	25	25	21	24	14	9
	A (3)	37	33	35	41	50	45	45	29	41	39
	D (2)	4	11	7	7	5	9	14	25	21	30
	SD (1)	0	0	2	1	0	1	0	2	4	2
Mean		3.44	3.31	3.31	3.28	3.25	3.18	3.09	2.94	2.81	2.69
Std. Error of Mean		.066	.079	.083	.075	.063	.075	.074	.095	.087	.079
Median		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Mode		4	4	4	3	3	3	3	3	3	3
Std. Deviation		.592	.704	.739	.675	.563	.671	.660	.847	.781	.704
Variance		.350	.496	.547	.455	.316	.450	.435	.718	.610	.496
Skewness		-.503	-.527	-.961	-.648	.000	-.477	-.094	-.136	-.310	.081
Std. Error of Skewness		.269	.269	.269	.269	.269	.269	.269	.269	.269	.269
Kurtosis		-.633	-.842	.828	.450	-.347	.333	-.656	-1.046	-.173	-.342
Std. Error of Kurtosis		.532	.532	.532	.532	.532	.532	.532	.532	.532	.532
Range		2	2	3	3	2	3	2	3	3	3
Minimum		2	2	1	1	2	1	2	1	1	1
Maximum		4	4	4	4	4	4	4	4	4	4

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.775	.774	10

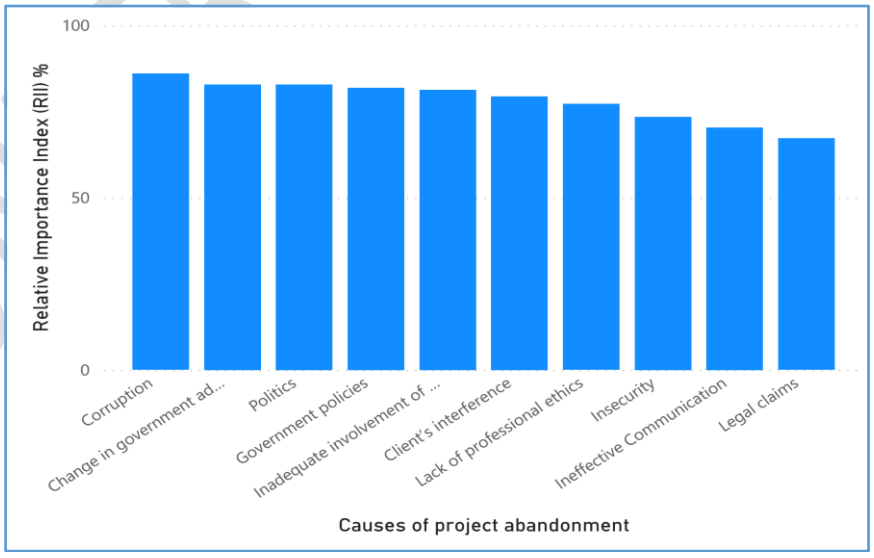

Fig. 2: The RII(%) of the causes of project failure and abandonment

Table 4: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Corruption	.316	80	.000	.729	80	.000
Change in govt. admin.	.286	80	.000	.774	80	.000
Politics	.274	80	.000	.773	80	.000
Government policies	.271	80	.000	.779	80	.000
Inadequate involvement of construction professionals	.359	80	.000	.729	80	.000
Client interference	.290	80	.000	.791	80	.000
Lack of professional ethics	.290	80	.000	.793	80	.000
Insecurity	.203	80	.000	.841	80	.000
Ineffective communication	.282	80	.000	.849	80	.000
Legal claims	.271	80	.000	.827	80	.000

a. Lilliefors Significance Correction

Table 5: Spearman's rho correlation

			Corruption	Change in govt. admin.	Politics	Govt. policies	Inadequate involvement of construction professionals	Client interference	Lack of professional ethics	Insecurity	Ineffective comm.	Legal claims
Spearman's rho	Corruption	Correlation	1.000	.315**	.201	.364**	.258*	.246*	.222*	.425**	.130	.381**
		Sig. (2-tailed)	.	.004	.074	.001	.021	.028	.048	.000	.251	.000
	Change in govt. admin.	Correlation		1.000	.217	.251*	.141	.349**	.347**	.477**	.271*	.278*
		Sig. (2-tailed)		.	.053	.025	.212	.001	.002	.000	.015	.012
	Politics	Correlation			1.000	.212	.095	.178	.017	.305**	.415**	.225*
		Sig. (2-tailed)			.	.059	.402	.113	.880	.006	.000	.045
	Govt. policies	Correlation				1.000	.088	.363**	.159	.314**	.184	.351**
		Sig. (2-tailed)				.	.439	.001	.160	.005	.103	.001
	Inadequate involvement of construction professionals	Correlation					1.000	.261*	.345**	.309**	.080	.216
		Sig. (2-tailed)					.	.019	.002	.005	.482	.054
	Client interference	Correlation						1.000	.225*	.445**	.228*	.130
		Sig. (2-tailed)						.	.045	.000	.042	.250
	Lack of professional ethics	Correlation							1.000	.277*	.228*	.255*
		Sig. (2-tailed)							.	.013	.042	.023
	Insecurity	Correlation								1.000	.266*	.285*
		Sig. (2-tailed)								.	.017	.010
	Ineffective comm.	Correlation									1.000	.295**
		Sig. (2-tailed)									.	.008
	Legal claims	Correlation										1.000
		Sig. (2-tailed)										.

**. Correlation is significant at the 0.01 level.
*. Correlation is significant at the 0.05 level.

Table 6: Hypothesis Test Summary

	Null Hypothesis	Sig.	Decision
1	Corruption	.684	Retain the null hypothesis.
2	Change in government administration	.344	Retain the null hypothesis.
3	Politics	.538	Retain the null hypothesis.
4	Government policies	.734	Retain the null hypothesis.
5	Inadequate involvement of construction professionals	.938	Retain the null hypothesis.
6	Client's interference	.337	Retain the null hypothesis.
7	Lack of professional ethics	.909	Retain the null hypothesis.
8	Insecurity	.729	Retain the null hypothesis.
9	Ineffective communication	.030	Reject the null hypothesis.
10	Legal claims	.137	Retain the null hypothesis.

3.2 Discussion

One hundred (100) Questionnaires were distributed by hand in Kaduna, for which eighty (80) of them were successfully filled and collected. This shows a high response rate of80% and 20% of the questionnaire was not returned which gives an indication that the sample study has interest towards this subject.

The profile indicates that 85% of the respondents are male, while 15% are female, 19% of the respondents are architects, 34% are builders and 20% are civil engineers. In terms of the respondent's experience, 46% of the respondents had between 0 to 9 years' experience, 25% had between 10 to 19 years' experience, 18% had between 20 to 29 years' experience while 2% had 30 and more years of experience.The characteristics listed above indicates that the respondents possess the requisite knowledge and experience to provide reliable information on which reliable conclusions can be made.

The reliability statistics for the survey questionnaire was carried out. It had an internal consistency with a Cronbach's alpha of 0.775. ACronbach'salpha value of 0.70 and above is acceptable.

In the analysis, *Corruption* ranked first with a Relative Importance Index (RII) of 85.9%. The descriptive statistics show the mean and standard deviation to be 3.44 and 0.592 respectively.Corruption is one of the most widely discussed topic in the construction industry today[24], [26], [34]–[37]. It takes the form of "kickbacks", bribery, fraud and so on. Although regulations have been put in place, weak regulatory systems, non-competitive and inequitable bidding practices contribute to the inability to eliminate corruption in the construction industry [38].Corruption distorts decisions, drift projects away from the public benefit with a high probability to fail, and, if peradventure such projects are completed, they provide to the public projects with fundamentally diminished value [39].

The second ranking factor was *Change in government administration* with a RII of 82.8% the mean of 3.31 and standard deviation of 0.704.The change in government administration is one of the several factors leading to project failure and abandonment[24]. Interestingly, this also affects some private developers as most of them have their source of funding from their cronies in government. The abandonment of projects from previous governments may not be unconnected to the desire of each successive government to credit itself for starting its projects, even though completion of projects embarked upon by the preceding administration will have much impact on the masses. This is made worse if the incoming administration is not of the same political party as the outgone administration.

Politics ranked third with a mean of 3.31, standard deviation of 0.739 and RII of 82.8%. Political influence on construction projects usually occur in the form of political decisions that impact the management and administration of such projects. This include areas such asin the allocation of funds, planning and organization.The findings from this study is in agreement with the findings of [24], [26] in which political interference was also ranked third. Other studies [19] ranked political interference the sixth most significant factor while [23] in his study did not consider this factor significant enough to cause failure and abandonment of projects in tertiary institutions.

Government policies ranked fourth with a mean of 3.28, standard deviation of 0.675 and RII of 81.9%. Government policies that affect construction projects may include financial, legal or physical policies. Financial policies could involve change in monetary policy which can affect

loans borrowed as interest rates my go up suddenly as well as unwillingness on the part of the lending agencies to extend credit line etc.Similar studies by other researchers ranked unfavourable government policies second[40], [17] ranked it fifth,[41] ranked government policies as sixth, while[23] ranked government policies eleventh and considered it significant enough to cause project failure and abandonment.

The *Inadequate involvement of construction professionals*in construction projects was also identified as a cause of project failure in the study area. It ranked fifth. The descriptive statistics showed a mean of 3.25, standard deviation of 0.563 and a Relative Importance Index (RII) of 81.3.

Client's interference ranked sixth with a mean of 3.18, standard deviation of 0.671 with a RII of 79.4%. Client interference in construction projects refers to actions or inactions carried out by the client or his design team that may have a negative effect on the project. Some of these include having unreasonable expectations, delay by the client's team, cutting costs arbitrarily, removal of essential items from the project etc.

Lack of professional ethics ranked seventh with a Relative Important Index (RII) of 77.2%. The mean and standard deviation were 3.09 and 0.660 respectively. Engaging in unethical practices can lead to contract disputes, safety incidences, higher costs and lower profits, reworks, loss of reputation etc.

Insecurity ranked eight with a Relative Important Index (RII) of 73.4%. The mean and standard deviation were 2.94 and 0.847 respectively. Insecurity in Nigeria has adversely affected construction project progress as kidnappers and insurgents have caused many construction firms with the technological know how unwilling to undergo construction work, as activities have been put on hold due to unending attacks in the study area. This is however in contrast with the findings of[26] in Afghanistan where insecurity was ranked first. The low ranking of insecurity suggests that other causes of project abandonment have been encountered in the industry over time as compared to insecurity, hence the low perception.

Ineffective Communication ranked ninth with a Relative Important Index (RII) of 70.3%, a meanand standard deviation of 2.81 and 0.781 respectively. Communication is key in project development and management. In any profession, communication is vital especially in cases where delegation of work is inevitable. Hence, without clear and efficient communication of the progress and tasks ahead, various parties may remain unaware of the next activity. Ineffective communication has also been identified by several researchers as a factor of project abandonment. [5], [35], [37], [42], [43].

*Legal claims*ranked tenth with a Relative Important Index (RII) of 67.2%, a mean and standard deviation of 2.69and 0.704 respectively. Claims in the construction industry may be due to delays, change of work orders, site conditions, variations, damage etc. Several other studies have also identified legal claims as a factor causing project abandonment. [41], [44]. The low perception of legal claims in relation to the other factors by construction professionals as a cause of project failure and abandonment in the study suggests that, parties involved in the construction of projects now seek other considerate means such as early settlements and/or mediation. This helps to forestall project delays, cost overrun and abandonment as it provides a means for both parties involved to come to a compromise quickly.

The Kolmogorov-Smirnov and Shapiro-Wilktests of normality (Table 4) shows that the data does not pass the normality test as the P value for all the items was less than the alpha value of 0.05.

The Kruskal-Wallis test was therefore used in the analysis of the data to determine if the distribution of the causes was the same across the profession of the respondents. The Kruskal-Wallis test is the non-parametric test equivalent of the Analysis of variance (ANOVA). The results shownine out of the ten causes identified hadprobability of significance (P values)above 0.05, so we fail to reject the null hypothesiswhile ineffective communication, statistically, showed some significant difference with a p value of 0.03.The analysis shows that the distribution of the causes of project failure and abandonment was the same across the categories of the correspondent's profession except for the variable "ineffective communication" for which the null hypothesis was rejected.

The degree and direction of association of the identified variables was analysed using the Spearmanrho's correlation. The Spearman's correlation coefficient is a statistical tool that determines the direction and degree of relationship between two variables with values ranging from -1 (a perfectly negative relationship) and +1 (a perfectly positive relationship). The degree of relation depends on the closeness to the absolute value of 1. The correlations as examined between the causes of construction projects failure and abandonment are presented in table 5. Although the relationships did not show high correlation values, 30 significant correlations were recorded between the items at a 0.01 and 0.05 alpha levels. This suggest that there exists significant relationship between the variables.

4.0 Conclusion and recommendations

This paper studied failure and abandonment of construction projects in Kaduna State, Nigeria. Ten (10) factors were identified and through a questionnaire survey, the perception of construction professional was assessed. The identified factors were analysed using the Relative Importance Index (RII) to determine their relative ranking.From the ranking, Corruption, Change in government administration, Politics, Government policies and Inadequate involvement of construction professionals were the five top most ranking causes of project failure and abandonment in the study area. This study can educate the professionals, policy makers and entire public on the causes of failed and abandoned projects in the construction industry while also serving as an additional resource for further research in the study area for other researchers.
In order to overcome this menace, contractual processes leading to the award of contracts should be made as transparent and as simple as possible. Transparency, accountability and strict adherence to professional ethicsbe exhibited at all stages of the contract. Regulation put in place to compel an incoming administration to complete projects that have commenced under the outgoing administration before embarking on new projects. It is worthy to note that in 2019, the government of one of southwestern states in Nigeria did sign into law an act to prevent the abandonment of projects by new administrations [45]. Acquisition and compliance with all necessary documentation signifying ownership, agreements, bills and other aspects of the construction project be put in place before the commencement of new projects. Regulatory agencies should ensure that relevant and certified professionals be involved in the execution of projects. Construction professionals should ensure the timely dissemination of information through effective communication.

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

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