

Impact of Risk Factors for Project Abandonment of Building Construction Projects in Sri Lanka

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Abstract— In Sri Lanka there are many building projects which are either incomplete or simply neglected. It is challenging for any country to see significant development if its construction industry is inefficient. This is especially true for nations where numerous initiatives are frequently abandoned. Around the world, projects are still being abandoned. In Sri Lanka number of abandoned projects has increased. Structured questionnaires and interviews and comprehensive literature survey guided the study. The responses were composed via e-mail and interviews. There were 50 responses from questionnaire survey and 10 interviews including project managers, architects and chief Quantity surveyors which, were chosen at random. Using SPSS, these statistical data were examined using correlation and regression techniques, and content analysis was used to evaluate the interviews. The findings demonstrated that there is a strong correlation between the risk indicators and the project abandonment. The findings and recommendations that were gained from this study can be applied for reducing the abandonment of building construction projects in Sri Lanka.

Keywords— Risk factors, Project abandonment, Building constructions, Sri Lanka

I. INTRODUCTION

The economic and physical growth of Sri Lanka is significantly influenced by construction industry. Construction is the fourth-highest sector in Sri Lanka's economy, behind services, manufacturing, and agriculture (Kandalama & Lanka, 2008). If a nation's construction sector is inefficient, progress in that nation will be challenging (Olanrewaju & Abdul-Aziz, 2015).

Building and civil engineering projects fall into two basic types. Building projects include residences, offices, shops, schools, hospitals, railroad stops, etc. All other manmade constructions in our environments, such as roads, bridges, trains, canals, and docks, are subject to civil engineering (Kulkarni, 2007).

This is especially true for nations where the majority of their projects are frequently abandoned and failing to achieve their original goals. Russia, Spain, Abu Dhabi, Dubai, and Saudi Arabia, Malaysia, Ghana are just a few of the countries where projects that are abandoned. (Abdul-Rahman, Wang, & Mohamad, 2015). Project abandonment is a challenging problem in Sri Lanka,

especially with this financial and economic crisis.

However, the majority of Sri Lankan construction firms do not find what risks cause them. As a result, this circumstance could abruptly result in project failure defined by cost overruns, schedule overruns, and unsatisfactory performance.

Because the construction business is so dynamic, it has been discovered that it is constantly looking for ways to reduce hazards. The significant need for adapting risk mitigation practices is demonstrated by the numerous claims, delays, and budget overruns associated with infrastructure building (Churchill & Coster, 2001).

According to prior research, recently contractors have become more open to sharing responsibility of the risks that come with contractual and legal issues. According to prior studies, the absence of combined the industry has switched from risk transfer to risk reduction, present risk management systems are insufficient to manage project risks, and risk management processes are the main impediment to adequate risk management (Mills, 2001). There is a need of finding risk factors for project abandonment. To achieve those targets this paper aims to get the base knowledge by identify the impact of risk factors on project abandonment in Sri Lankan building constructions.

In previous research, the major factors for risk abandonment in Sri Lanka were not investigated clearly. Also, a proper analysis of the relationship and impact of project abandonment with risk factors on building projects in Sri Lanka could not be found. The recommendations which can minimize project abandonment in building construction projects also would not have been proposed. Also the issues related specially with the building project abandonment also not discussed previously. The identification of such a relationship leads to the minimization of project abandonment in Sri Lanka. The identification of the components and their impact may help relevant authorities to enhance the project abandonment and the the project's success as well. As a result, it was found that the aforementioned factors satisfied the study gap to reduce project abandonment in building construction

The objectives of the study are identifying the relationship between the risk factors and project abandonment in construction, identify the impact of risk factors on project abandonment in construction, prioritizing risk factors affecting building project abandonment in Sri Lanka, identify the issues of project abandonment in building constructions in Sri Lanka and to figure out the recommendations to minimize project abandonment in Sri Lankan building construction

II. LITERATURE REVIEW

A. Building Constructions in Sri Lanka

There are so many challenges in front of the Sri Lankan construction industry. The civil war which occurred before 2009 was one of that. The Colombo-based brokerage NDB Securities (NDBS) estimates that Sri Lanka's construction industry grew by more than 20% in 2014, the construction industry contributed 9.6% of Sri Lanka's GDP, a significantly higher share of the economy., according to NDBS data, than other most of the other countries in Sri Lanka. Building construction in Sri Lanka decreased recently after COVID-19. Sri Lanka's central bank forecasted 4.5 to 5% economic growth, but currently anticipates economic growth of 2.2% (Perera et al., 2020). Again now Sri Lankan financial crisis deeply affects the building constructions in Sri Lankan Construction Industry. Slowing business in process was carried the nation's economic crisis that Contractors in Sri Lanka's construction industry are in desperate trouble as a result of 150 billion rupees in unpaid work undertaken for the government. (Perera et al., 2020).

B. Risk factors of project abandonment in building construction

There are several reasons why projects are abandoned globally, with some reasons predominating over others in different circumstances. For instance, between 2005 and 2010, problems with a contractor, a lack of funding, political concerns, a change in governments, and the construction of projects in Nigeria including government roads, a bridge, and independent power producers were abandoned. (Amade et al., 2015).

Poor project planning, insufficient funding, inflation, contractor bankruptcy, changes in the project scope, political reasons, incorrect estimates, and unqualified/inexperienced consultants are some of the factors cited by Olusegun for an analysis of abandoned construction projects in Nigeria (Olusegun, 2011).

All those factors for risk abandonment can be categorized mainly as follows (Abdul-Rahman, Wang, & Ariffin, 2015).

1) *Financial risks*: Cost overruns can have catastrophic effects on construction projects. A cost to the client that is over and above what was initially agreed upon, resulting in a lower return on investment. The increased costs are transferred to the final consumer as higher or lower costs or pricing. Cost overrun signifies a failure to provide value for the money, which to professionals can damage their reputation and cause clients to lose faith in them. It involves lost profits due to non-completion and libel that, if committed, could harm the contractor's chances of landing future contracts (Xenidis & Angelides, 2005).

13 of the 23 risk factors were designated the 13 most critical risk factors since their mean rates were higher than 4. The experts' new risk factor, "poor contract management," which they found is specific to Sri Lanka, is the second most important of those 13 is financial problems (Perera et al., 2020).

The probability of almost all financial risks was considerable, with 70% of respondents assigning "over budget" and "bankruptcy by developer" high or very high possibilities. A moderate probability of unstable third-party financing was reported by 37.5% of respondents. (Abdul-Rahman, Wang, & Ariffin, 2015).

2) *Political Risks*: The ruling parties of a nation can have a variety of effects on a construction project. (Tchankova, 2002). Contractors are exposed to risk from government authorities since shifting government and government policies have the ability to negatively impact the project's success (Harinarain et al., 2006). As possible causes of building project abandonment, inconsistent government regulations, a lack of accountability, a high level of corruption, incompetent contractors, a shortage of construction materials, a lack of facilities or infrastructure, the wrong location, etc., have all been put forward (Adeleke, 2005).

50% of respondents said that bureaucracy and unstable political environments were very probable important dangers in Malaysian construction projects. However, respondents did not view any of the following as substantial dangers that could result in abandoned housing projects. The risks include disruption caused by the local government and suspension of the foreign worker by the government. (Maseko, 2018).

3) *Legal Risks*: One of the key reasons why construction projects are abandoned is the law. All stakeholders should be quite educated about the rules and regulations in this sector of the economy. Risks associated with this category include contract breaches, disputes between developers and landlords, delays in the resolution of such disputes, changes to the law governing the housing business, and developer ignorance of such laws (Abdul-Rahman, Wang, & Ariffin, 2015).

Further that the ambiguity of contractual terms and conditions, the inefficiency of addressing conflicts and disagreements among project stakeholders, and the legal risks associated with conducting business with project participants are major factors contributing to the failure of construction projects. (Nguyen & Chileshe, 2014)

4) *Constructional Risks* :In projects where design changes and construction methods are the main risk factors, lack of technical advice was one of the dangers(Elahi et al., 2011).

Risks associated with construction are those that management can easily foresee and control. Requirements are constantly changing globally, so project managers must stay up to date on these changes. Project managers must avoid utilizing unproven technological techniques, incorrect programs, too-high quality standards, and inferior equipment (Maseko, 2018).

5) *Management Risks*:Another critical element in the development of a construction project is management .The management could make sure the project is well-organized and finished on schedule and within budget. Risks under management are weaknesses by inexperienced developers and contractors, delays in work due to third-party management failures, risks posed by subcontractors, and partner withdrawals from joint ventures(Abdul-Rahman, Wang, & Ariffin, 2015).

Project abandonment is also a result of inadequate planning, poor risk management, misinterpretation of the required skills, inadequate quality control by regulatory authorities, corruption, and a lack of communication among the staff, all of which come under the category of management risks(V Doraisamy, 2015).

6) *Environmental Risks*:One of the dangers that those participating in the building sector must consider is the impact on the environment. However, almost half of the respondents (47.5%) concurred that there is a high probability of unforeseen site conditions.

The environmental effects of abandoned construction projects include visual effects, landscape modification, erosion, biodiversity loss, and pollution. Every project has a start and end date that are used to determine contract values.The expansion of uncontrolled and unsupervised garbage disposal, the encouragement of population marginalization, and visual defects at the job site are some examples of the problems caused by abandoned projects.(Margaret, 2022).

III. RESEARCH METHODOLOGY

Under the methodology, the methods used to achieve the objectives should be described. it is a way of describing how the research problem solves systematically. The research was completely evaluated through questionnaire survey & interviews with the concerned authorities. The combinations of qualitative & quantitative methods are highly appreciated because it gives a comprehensive picture & enhance the study about the research area(Audhkhasi ., 2018).

A. Data Collection Methods

A web based detailed questionnaire (Google forms) was

circulated among professional groups in construction industry, Sri Lanka sent through e-mails to the construction firms. Questionnaires were distributed among professionals in order to obtain suitable responses to the questionnaire & different viewpoints were ranked accordingly to the “Likert Scale”. A total number of filled questionnaires were 50.

Semi-structured interviews provide the freedom to discuss about numerous areas widely.A purposive sample was selected for the semi-structured interviews since the objective is to select the partakers who have better knowledge & industry experience in the area of research study.

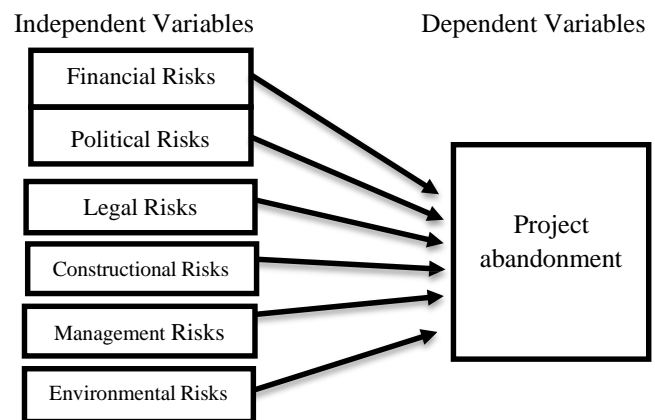


Figure 1: Conceptual framework

To examine, the agreement among respondents the hypotheses were developed as follows. Based on the above conceptual framework figure 1 the following assumptions are proposed.

HA₁ (Alternative factor) - There is a relationship between financial risks and Project abandonment

HB₁ (Alternative factor) - There is a relationship between the Political risks and Project abandonment

HC₁ (Alternative factor) - There is a relationship between the Legal risks and Project abandonment

HD₁ (Alternative factor) - There is a relationship between the Constructional risks and project abandonment

HE₁ (Alternative factor) - There is a relationship between Management risks and project abandonment

HF₁ (Alternative factor) - There is a relationship between Environmental risks and project abandonment.

C. Data Analysis Methods

Primary data has been analyzed using quantitative techniques and secondary data has been analyzed using a content analysis.The results of the questionnaire survey have been analyzed by SPSS to check the reliability using Cronbach's Alpha test, relationship and impact of the data.

1. *Correlation analysis:* This helps to analyze the relationship between different variables in a multivariable analysis study. In this correlation coefficient is measured by the “Pearson Correlation Analysis” which is analyzed with the use of SPSS software. The output value of analysis is always been -1 and +1. Correlation coefficient equals to -1 shows there is negative relation between selected two variables, correlation coefficient +1 shows there is positive relation between selected two variables & correlation coefficient 0 shows there is no relation between selected two variables. For this research the coefficient value is determined as “P” & the significance level is 0.05.

2. *Regression analysis:* Regression analysis was carried out using the same statistical data that was gathered and examined using SPSS software. This study set out to determine which factor has the most influence on abandonment in Sri Lanka's building industry. The linear regression is computed for this investigation.

IV. DATA ANALYSIS

A. Correlation Analysis

This analysis was used to examine the intensity of the relationship between the risk factors and project abandonment. The relationship between dependent and independent variables was determined using the Significance (P). There are two types of outputs that can be seen in this analysis. When P is less than 0.05, there is a relationship between the independent variable and dependent variable which satisfies the H1 (Alternative Factor). When the P is greater than 0.05, there is a relationship between the independent variable and dependent variable which satisfies the H0 (Null Factor). The correlation results between the risk factors and project abandonment are represented in Table.

Table 2: Correlation coefficient analysis of variables (SPSS software generated)

		Correlations						
		PA	FR	PR	LR	CR	MR	ER
PA	Pearson Correlation	1	.342*	.553**	.665**	.730**	.692**	.628**
	Sig. (2-tailed)		.015	<.001	<.001	<.001	<.001	<.001
	N	50	50	50	50	50	50	50
FR	Pearson Correlation	.342*	1	.086	-.026	.081	.084	.083
	Sig. (2-tailed)	.015		.554	.860	.578	.561	.564
	N	50	50	50	50	50	50	50
PR	Pearson Correlation	.553**	.086	1	.535**	.291*	.225	.201
	Sig. (2-tailed)	<.001	.554		<.001	.040	.116	.162
	N	50	50	50	50	50	50	50
LR	Pearson Correlation	.665**	-.026	.535**	1	.434**	.341*	.254
	Sig. (2-tailed)	<.001	.860	<.001		.002	.015	.075
	N	50	50	50	50	50	50	50
CR	Pearson Correlation	.730**	.081	.291*	.434**	1	.616**	.446**
	Sig. (2-tailed)	<.001	.578	.040	.002		<.001	.001
	N	50	50	50	50	50	50	50
MR	Pearson Correlation	.692**	.084	.225	.341*	.616**	1	.452**
	Sig. (2-tailed)	<.001	.561	.116	.015	<.001		<.001
	N	50	50	50	50	50	50	50
ER	Pearson Correlation	.628**	.083	.201	.254	.446**	.452**	1
	Sig. (2-tailed)	<.001	.564	.162	.075	.001	<.001	
	N	50	50	50	50	50	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

PA=Project abandonment

FR=Financial risks

PR=Political risks

LR=Legal risks

CR=Constructional risks

MR=Management risks ER=Environmental risks

Financial risks (FR), it has a positive relationship with a value of 0.342, has obtained 0.015 (P<0.05) significance level over the project abandonment as indicated in Table 2, and it is indicated that there is a relationship between Financial risks and project abandonment. Therefore, the assumption of HA₁ of the hypothesis is accepted.

Political risks (PR), it has a positive relationship with a value of 0.553, has obtained <0.001 (P<0.05) significance level over the project abandonment as indicated in Table 2, and it is indicated that there is a relationship between Political risks and project abandonment. Therefore, the assumption of HB₁ of the hypothesis is accepted.

Legal risks (LR), it has a positive & strong relationship with a value of 0.665, has obtained <0.001 (P<0.05) significance level over the project abandonment, and it is indicated that there is a relationship between Legal risks and project abandonment. Therefore, the assumption of HC₁ of the hypothesis is accepted.

Constructional risks (CR), it has a positive & strong relationship with a value of 0.730, has obtained <0.001 (P<0.05) significance level over the project abandonment, and it is indicated that there is a relationship between Constructional risks and project abandonment. Therefore, the assumption of HD₁ of the hypothesis is accepted.

Management risks (MR), it has a positive & strong relationship with a value of 0.692, has obtained <0.001 (P<0.05) significance level over the project abandonment, and it is indicated that there is a relationship between management risks and project abandonment.

Therefore, the assumption of HE₁ of the hypothesis is accepted.

B. Regression Analysis

The regression analysis was applied to identify the impact of the risk factors on project abandonment. When focused on independent variables and dependent factors, this includes certain simulation and regression approaches for multiple variables.

Table 3: Regression analysis (SPSS software generated)

Model		Coefficients ^a				
		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
1	(Constant)	-.124	.198		-.628	.533
	FR	.232	.036	.273	6.399	.003
	PR	.111	.031	.179	3.547	.001
	LR	.212	.035	.321	6.013	.002
	CR	.135	.031	.247	4.362	.024
	MR	.149	.033	.249	4.503	.011
	ER	.190	.035	.267	5.494	.012

a. Dependent Variable: PA

Dependent variable: PA

V.CONCLUSION

From the above table 4 explained to the regression model as follows,

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

$$Y = 1.621 + (0.129 * AM1) + (0.278 * AM2) + (0.266 * AM3) + S.E$$

$$(X_1 = AM1, X_2 = AM2, X_3 = AM3, \alpha = \text{Constant})$$

Equation 1: Regression analysis

Every time the beta value shows a positive value, there is a positive association with financial risk factors. More specifically, the project abandonment will rise by 23.2% as financial risks rise by the same percentage. The association will be inverse if the Beta value suggests a negative value.

The beta value 0.111 indicates 11.1% variance of project abandonment in Sri Lankan building construction industry is affected by Political risks. Every time the beta value shows a positive value, there is a positive association. Specifically, project abandonment will rise by 11.1% while political risks rise by the same amount.

The beta value 0.212 indicates 21.2% variance of project abandonment in Sri Lankan building construction industry is affected by Legal risks. Every time the beta value shows a positive value, there is a positive association. More specifically, the project abandonment rate will rise by 21.2% while legal risks.

The beta value of project abandonment in Sri Lankan building construction industry is affected by Constructional risks. Every time the beta value shows a positive value, there is a positive association. More specifically, the project abandonment rate will rise by 13.5% while construction risks rise by the same amount.

14.9% variance of project abandonment in Sri Lankan building construction industry is affected by management risks. Every time the beta value shows a positive value, there is a positive relationship. More specifically, a rise in management risks of the same amount will cause a 14.19% increase in project abandonment.

The Sri Lankan building construction industry is affected by environmental risks. Project abandonment will rise by 14.19% while environmental risks rise by the same amount.

The beta value 0.190 indicates 19% variance of project abandonment in Sri Lanka. Every time the beta value shows a positive value, there is a positive relationship.

Financial crisis is the most affected factor for project abandonment, bankruptcy and unstable political and economic condition of the country are among the highest factors which affect building project abandonment. Risk factors are ranked according to priority. To fulfil the third objective ranking these activities were used RII (Relative Importance Index) analyzing method.

To achieve the fourth objective of this study is to identify the issues of project abandonment in building projects in Sri Lankan Construction Industry.

The experts' ideas included decreasing tax rates, Removing import bands of raw materials, and requiring a professional team to procure and deliver, Only projects, which can be finished within the time frame and with available resources, should be initiated, Client must be a good paymaster, Obligations and duties of the parties must be fulfilled, Selection process of contractors and consultants should be by honesty, integrity, transparency, accountability and capability, Using new technologies like BIM, Be conversant with contractual matters and contractual rights, Needs to make sufficient time available for consultants to do a proper design.

Based on the research findings the long term recommendations of experts are to increase the usage of new technologies, maintaining prequalification assessment of client/contractor and the ground conditions as well, maintaining a system of abandoned projects in Sri Lanka with the steps they have taken to minimize them, decrease the tax rates, removing the import limitation decrease the loan rates. Also short term recommendations are require a professional team, project members must be convenient with contractual matters, improving the efficient project planning, client should provide sufficient funds and be a good paymaster, obligations and the responsibilities of the parties must be performed.

This research was limited only to study the impact of risk factors on project abandonment in Sri Lankan building construction industry. Another limitation that was faced in this research was even though this is for the Sri Lankan building constructions only the ideas of the experts in some major projects and major companies were taken to this study

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