Risk Level of the Types and Causes of Claims in Construction Projects of Pakistan

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Abstract

Managing claims is very essential for successful construction projects. For this, the identification of claims and the causes of occurrence of the claims are very crucial. Hence, this research investigated the types and causes of claims and their risk level in construction projects in Pakistan. The study was carried out based on a quantitative mode of research using a questionnaire survey. The survey was conducted amongst the professionals (client, consultant, and contractors) involved in handling construction projects. The survey was done by visiting the participants in person and electronically. A total of 51 completed questionnaire forms were received. Data were analyzed using the SPSS (v20) and Microsoft Excel spreadsheet program. The results suggested that payment-related issues, evaluation of the quality and quantity of completed works, Final cost, Awarding bid to the lowest bidder, and Change or variation orders are the top 5 claim causes with the highest risk level. At the same time, the top 5 types of claims with the highest risk level are Extra-work claims, Payment/Financial, Extension of time, Change claims, and Escalation. This study will help practitioners to recognize the risk-related issues of claims occurring in construction projects.

Keywords—Construction Claims, Types of Claims, Causes of Claims, Construction project, Pakistani Construction Industry.

1 Introduction

The construction industry is regarded as the backbone of a country's economy[1][,2]. It is the essential component and key role player in accomplishing the physical needs required for living and survival of life[3]. If the construction sector grows, it typically means that the economy is rising. Like other developed and developing countries of the world, the construction sector of Pakistan also has received high attention and significant growth in residential and commercial projects during the last few years. But, due to the high level of fluctuation in the market, the development works are suffered a lot. Besides this, the complex and resource-driven nature of the construction industry has increased the number of claims. The increased number of claims reflects the poor management of the projects. Consequently, many of the projects have failed in accomplishing the tasks within the set time and cost [4]. Time and cost overruns are reported as common issues in construction projects in Pakistan. A claim is a request for reimbursement for damages suffered by any contracting parties [5]. It is a formal demand or assertion by any contracting parties for reimbursement, the adjustment, and clarification of contract conditions or other relief resulting from or relating to a particular contract [6]. Construction claims directly and significantly affect project performance [7]. Therefore, claims are considered the most disruptive and undesirable aspects of a project [8]. The construction sector is plagued by a hostile attitude between clients and contractors due to conflicts and disputes over claims [9]. [10], investigating the effect of the claims on construction projects, highlighted that the construction claims directly affect the time and quality. Since the contractor's claim to the owner causes an increase in project duration, it sometimes

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causes temporary suspension of the work. Therefore, it is essential to manage the claims before they turn into disputes[11]. Therefore, understanding the claims' types and causes for effective claim management is essential. Hence, this study assessed the risk level of different causes and types of claims in Pakistan. The findings of this research work will be helpful for the practitioners to prepare risk management strategies for controlling claims on-site and achieving effective and successful project management.

2 Literature review

Several studies have been conducted in different parts of the world to find the types and causes of construction claims. Ref[12] researched to study construction claims in the Kingdom of Bahrain. The top five causes of construction claims were changed or variation orders; delay in payments to contractors and resulting cash problems during construction; insufficient time for bid preparation and inadequate investigation before bidding; delayed approval of shop drawings, instructions, and decision-making; and estimating errors. Similarly, "Changes and extra work claim", "Delay claim" and "Fluctuation in the price of building materials claim" were the most common types of claims. Ref[13] attempted to identify and analyze the most common causes of claims in UAE road-building projects, and the core reasons that lead to claim occurrence were found a lack of proper design, the speed with which tenders are issued, the speed with which construction is completed, and client changes all contribute to claims. Contractor delays were the second most common cause of claims.

Ref [14] researched to determine the most common causes of claims in India and revealed that the most significant factors leading to claims were late site handover, variation in quantities, overzealous changes by the owner, late approval of shop drawings, and change in scope. The most common types of construction claims were delay claims, changes claims, extra-work claims, other site conditions claims, acceleration claims, and disruption claims. Ref [15] studied the reasons for claims in the UAE construction industry through a questionnaire survey based on 124 common claims on various projects in both Emirates (Abu Dhabi and Dubai). The study revealed that common causes of claims are change orders, owner-caused delays, and planning errors were reported as significant reasons. At the same time, common types of claims were contract ambiguity claims, delay claims, acceleration claims, changes claims, extra-work claims, and unforeseeable site conditions. From the above studies, it can be seen that construction projects suffer from different types of claims. Furthermore, these claims occur due to a variety of causes. Therefore, a comprehensive review of the literature was conducted, which identified 25 common causes and 9 common types of claims as summarized in Table 1 and Table 2.

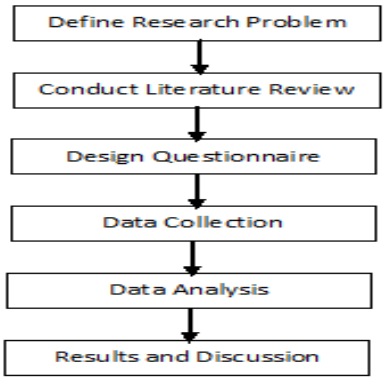

Fig. 1: Research Methodology

3 Methodology

This study conducted research work using quantitative mode for collecting the data. It used a structured questionnaire to record the response of the practitioners involved in handling construction projects. The detailed research methodology adopted for this study is represented in Fig. 1.

The questionnaire was developed in three sections, where section 1 focuses on recording the demography of the respondent. Section 2 of the questionnaire collects the frequency and significance of each cause of the claims while section 3 focuses on collecting information regarding types of claims in construction claims. Investigation for causes and types of claims involved the data collection regarding the level of occurrence and significance for each cause and type. The participant's response was recorded with the help of a likert scale, which is one of the widely used scales for rating[33], from 1 to 5 as explained in the table.

As depicted in table 3, the degree of occurrence and significance were used to evaluate the data. This degree was assessed using the Average Index (AI) value and the level of risk was evaluated based on the risk matrix[34,35] as illustrated in Fig. 2.

To calculate the level of risk, the risk matrix combines the AI values of the level of occurrence and level of significance. It is divided into three zones, each of which corresponds to a distinct level of risk:

- Green zone: The risk is minimal and may be disregarded;

TABLE 1: Causes of the Claims

S. No	CAUSES OF CLAIMS	REFERENCES															
		[15]	[16]	[17]	[18]	[19]	[14]	[20]	[21]	[22]	[23]	[24]	[25]	[13]	[26]	[27]	[28]
1	Change or variation orders	✓					✓		✓		✓	✓	✓	✓	✓	✓	✓
2	Delay caused by owner	✓					✓	✓	✓		✓				✓		
3	Payment related issues	✓		✓			✓		✓		✓		✓	✓	✓	✓	✓
4	Low price of contract due to high competition	✓		✓			✓								✓		
5	Variations in quantities	✓					✓		✓							✓	
6	Quality of work	✓					✓		✓		✓		✓	✓	✓	✓	
7	Estimating errors	✓							✓	✓	✓				✓	✓	
8	Scheduling errors	✓							✓								
9	Design errors or omissions	✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓	
10	Execution errors	✓					✓										
11	Unforeseen site Conditions	✓					✓	✓			✓	✓	✓		✓	✓	
12	Specifications and drawings inconsistencies	✓			✓	✓		✓		✓	✓		✓	✓	✓	✓	✓
13	Final cost		✓										✓				
14	inflation						✓				✓		✓			✓	
15	Lack of coordination among parties		✓	✓			✓			✓						✓	
16	Slow client response (decisions)		✓								✓						
17	Inadequate documentation									✓				✓			
18	Inadequate site investigation before bidding	✓												✓			
19	Delays of shop drawings approval by owner's representative						✓										
20	Discrepancies between contract documents						✓										
21	Complex execution of the project						✓										
22	Awarding bid to the lowest bidder						✓										
23	Changes in government regulations and laws						✓					✓					
24	Project government extrinsic factors									✓							
25	Evaluation of the quality and quantity of completed works															✓	

TABLE 2: Types of the Claims

S. No	TYPES OF CLAIMS	REFERENCES														
		[15]	[29]	[16]	[30]	[17]	[18]	[19]	[14]	[20]	[21]	[22]	[31]	[23]	[24]	[32]
1	Changes claims	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
2	Extra-work claims	✓		✓					✓		✓		✓			
3	Contract ambiguity claims	✓	✓	✓		✓		✓	✓		✓				✓	
4	Escalation			✓					✓							
5	Delayed approval/ design information			✓		✓										
6	Extension of time				✓	✓										✓
7	Payment/Financial					✓						✓			✓	✓
8	Project Safety											✓				

TABLE 3: Scale of the level of occurrence and level of significance

Indexing Value	Level of Occurrence	Level of Significance	Scale
1.00 AI 1.50	Never	No Significant	1
1.50 AI 2.50	Rarely	Slightly Significant	2
2.50 AI 3.50	Sometimes	Moderately Significant	3
3.50 AI 4.50	Mostly	Very Significant	4
4.50 AI 5.00	Always	Extremely Significant	5

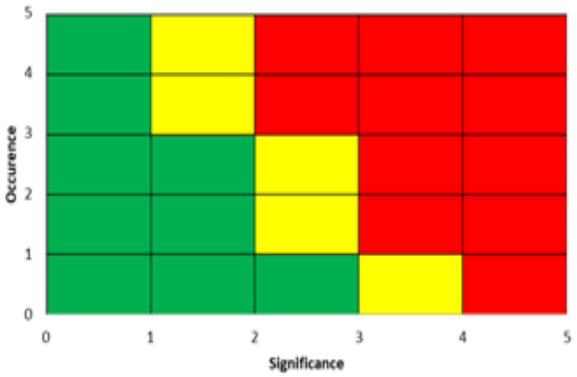

Fig. 2: Risk Matrix

- Yellow zone: The risk is moderate and of moderate concern; if the variables occur, they should be managed with certain measures and mitigations.
- Red zone: The risk level is high, and the situation is critical; quick action is necessary to cope.

4 Demography of the Respondents

Questionnaire sets were distributed among the practitioners of the construction industry of Pakistan through Google Forms and by hand. The respondents involved the practitioners representing client, consultant, and contractor organizations. As a result of the questionnaire survey, 59 questionnaire sets were collected back in 3 months. There were 8 incomplete questionnaire sets deemed invalid and inappropriate for further analysis, while the remaining 51 questionnaires were valid for further research. Before analyzing the data for assessing the causes and types of claims, the demography of the respondents was evaluated. Demography illustrates the factual information of the respondents [36]. The respondents participating in this survey worked in various construction industry sectors for several years. The demographic information of the respondents is presented in Table 4.

TABLE 4: Demography of the Respondents

Description	Frequency	Percent	
Type of Organization			
Contractor	24	47.1	
Consultant	15	29.4	
Client	12	23.5	
Experience of the Respondents			
0 - 5 years	29	56.9	
6 - 10 Years	9	17.6	
11 - 15 years	3	5.9	
15 Years	10	19.6	
Size of Projects			
Rs 20 M	7	13.7	
Rs 20M - Rs 50 M	6	11.8	
Rs 50M - Rs 150 M	7	13.7	
Rs 150 M - Rs 400 M	12	23.5	
Rs 800 M - Rs 1800 M	3	5.9	
Rs 1800 M - Rs 3000 M	4	7.8	
RS 3000 M	12	23.5	
Academic Qualifications			
Diploma	1	2.0	
Degree	31	60.8	
Masters	18	35.3	
PhD	1	2.0	

Table 4 shows that most respondents (24 of 51) are contractors, with a percentage of 47.1 percent. A

significant number of respondents, 15 of 51 with a percentage of 23.5 percent, are consultants, while 12 with a percentage of 23.5 percent are clients. According to Table 4, most respondents (24 of 51) are contractors, accounting for 47.1 percent of the total. A significant number of respondents, 15 of 51 (23.5 percent), are consultants, while 12 (23.5 percent) are clients. A significant proportion of respondents, 29 of 51, have 0-5 years of experience managing major projects, 9 have 6-10 years of experience, 3 have 11-15 years of experience, and 10 have experience beyond 15 years. These respondents have handled projects of varying sizes in terms of project cost. As shown in the table, 7 of 51 projects with a percentage of 13.7 percent have a cost of less than 20 million, and similar results exist for projects with a cost range of Rs 50 million to Rs 150 million. Similarly, 6 of 51 projects with a percentage of 11.8 percent have a cost range of Rs 20 million to Rs 50 million. 12 of 51 projects with a percentage of 23.5 percent cost between RS 150 M and RS 400 M, 3 projects cost between RS 800 M and RS 1800 M, and 4 projects cost between RS 1800 M and RS 3000 M. The table also shows that 12 of the 51 projects with a percentage of 23.5 percent are large projects with a project value of more than 3000 M. The column chart below depicts the percentage of various project costs. The respondents have completed a technical education program. According to the findings, most respondents, 31 of 51 with a percentage of 60.8 percent, hold a bachelor's degree. It is followed by the Masters level, which received 35.3 percent (81 of 51) of the votes. While one respondent has a diploma and one has a Ph.D. with a percentage of 2 percent of the respondents.

5 Risk Level of the Causes and Types of Claims

The risk level of the causes and types of claims was assessed by multiplying the Average index value of the level of occurrence and the Average index value of significance. The Average index values of the level of occurrence and significance with respective risk values for each cause of construction claim are presented in Table 5.

Table 5 shows that the AI value of the probability of occurrence for causes of claim causes is 3.549 to 2.275. These values of AI were based on the response of the respondents in Pakistan's construction sector, where 4 out of 25 causes fall into the Mostly Occur category, and 20 into the Sometimes Occur category. Just one cause of claim falls into the Rarely Occur category. Similarly, A. I values of the significance

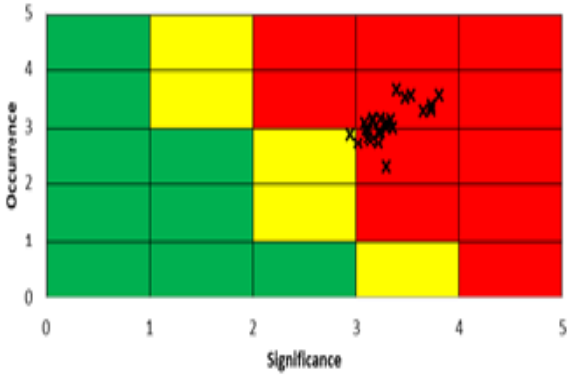

Fig. 3: Plotted Risk Matrix for causes of claims

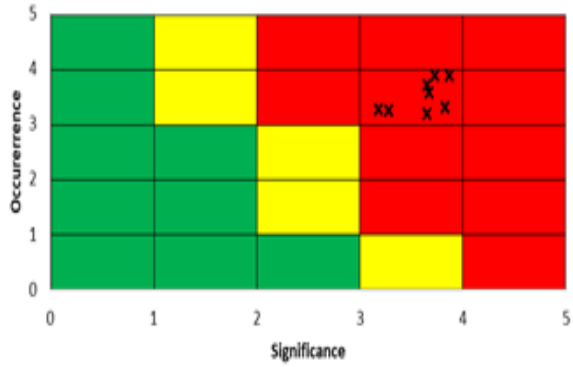

Fig. 4: Plotted Risk Matrix for Types of claims

of causes are within the range of 3.804 to 2.941. Among the cause, 5 causes are in the category of very significant while the remaining 20 causes fall into the moderately significant category. These values of occurrence and significance were plotted on the risk matrix to determine the risk level as shown in fig. 3.

Fig. 2 illustrates that 24 of 25 causes of claims lie in the red zone, indicating a high risk. This means that all of the causes of claims must be considered to manage claims. Only 1 cause falls in the yellow zone showing a moderate level of risk. AI value of the level of occurrence and significance for types of claims are calculated and presented in table 6, while risk levels determined with the risk matrix are illustrated in Fig. 4.

The findings of the level of risk calculation for types of claims as in Table 6 show that the probability of occurrence for claim types is in the range of 3.863 to 3.176. These values are obtained from the practitioners' responses where eight types of claims fell into the category of Mostly Occur while four types fell into the category of Sometimes Occur. The AI values of the types' significance fell from 3.863 to 3.176. The

TABLE 5: Causes of Claims

Causes of Claims	AI value of Occurrence	AI Value of Significance	Risk Level	Rank
Payment related issues	3.549	3.804	13.5	1
Evaluation of the quality and quantity of completed works	3.373	3.725	12.6	2
Final cost	3.549	3.529	12.5	3
Awarding bid to the lowest bidder	3.647	3.392	12.4	4
Change or variation orders	3.294	3.725	12.3	5
Variations in quantities	3.510	3.471	12.2	6
Quality of work	3.275	3.647	11.9	7
Inflation	3.118	3.333	10.4	8
Unforeseen site Conditions	3.137	3.235	10.1	9
Estimating errors	3.078	3.294	10.1	9
Inadequate site investigation before bidding	3.000	3.353	10.1	9
Low price of contract due to high competition	3.137	3.157	9.9	10
Lack of coordination among parties	3.000	3.294	9.9	10
Complex execution of the project	3.098	3.157	9.8	11
Delay caused by owner	2.922	3.235	9.5	12
Changes in government regulations and laws	3.059	3.078	9.4	13
Inadequate documentation	2.922	3.216	9.4	13
Scheduling errors	2.980	3.098	9.2	14
Delays of shop drawings approval by owner's representative	2.941	3.118	9.2	14
Execution errors	2.824	3.118	8.8	15
Design errors or omissions	2.706	3.216	8.7	16
Specifications and drawings inconsistencies	2.745	3.137	8.6	17
Project extrinsic factors	2.882	2.941	8.5	18
Discrepancies between contract documents	2.706	3.020	8.2	19
Slow client response (decisions)	2.275	3.294	7.5	20

participants' response shows that six of the eight types of claims are considered extremely substantial, while the other two are considered moderately significant. Fig. 4 depicts the risk level plotted region based on these assessed data in the risk matrix. It is found that all eight types of claims are in the red zone. This means that all types of risks are significant risks. This implies that all sorts of claims must be considered for claims management.

6 Conclusion

The study assessed the risk level of causes and types of claims occurring in the construction industry in Pakistan. Through a comprehensive literature review 25 causes and 8 types of claims were identified which were used for the investigation. The frequency and significance of causes and types of claims were determined using a questionnaire survey of respondents from various construction firms in Pakistan. The risk level of each cause and type of claim was calculated using the AI technique and shown on a risk matrix based on the probability of occurrence and degree of importance. According to the conclusions of this study, all of the studied causes of claim except one have a high-risk level and fall into the red zone of the risk matrix. Payment-related issues, evaluation of the quality and quantity of completed works, final cost, awarding the bid to the lowest bidder, and change or variation orders are, nonetheless, more significant causes of claims than others, according to AI values. Similarly, for types of claims, extra-work claims, Payment/Financial, Extension of time, change claims, and Escalation is more significant types of claims as per the risk level value.

7 Limitations of the Study

The limitations of this study are the number of respondents; the more respondents, the more accurate the results. Because each respondent will be an expert in only those elements that are relevant to his daily expertise, he will be able to provide accurate replies to those that are relevant to his part. The data was gathered from different stakeholders of various projects, so all respondents did not need to be completely knowledgeable about each element.

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