

Claim Causes and Types in Indian Construction Industry - Contractor's Perspective

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Abstract The number and frequency of claims in the current context of very complex and heavy budgeted projects in India are noticeably high which have negative impacts on the budgetary of owners and cause losses of liquidities and restrictions in cash flow for contractors. This study is conducted to determine the main causes of claims and their sources in Indian construction industry. Further, the study is conducted to determine the frequency of different claim types in Indian construction projects, and to provide recommendations and suggestions to avoid/mitigate claims in Indian construction industry. The objectives of the study have been achieved through a valid questionnaire that was distributed and obtained from different contractor's construction organizations working in Indian construction industry. The results showed that the most important factors that contributed to the generation of claims are delay in handing over site, variation between actual and original quantities, excessive change orders by owner, delay of shop drawings approval by owner's representative, and scope change of the project. The results also showed that the most frequent claim type in Indian construction projects is extra-work claims.

Keywords: *claim, construction, dispute*

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1. Introduction

Indian construction Industry plays a major role in the economic growth of a nation and occupies a pivotal position in the nation's development plans. The construction industry is the second largest contributor to the GDP in India after the agriculture sector. According to a report made by CIDC, the construction sector has been contributing around 8 per cent to the nation's GDP. The growth in construction sector in GDP has primarily been on account of increased spending on physical infrastructure in the last few years. With the present emphasis on creating physical infrastructure, massive investment is planned in this sector. The planning commission has estimated that investment requirement in infrastructure to the tune of about 41 trillion rupees, or about \$1 trillion, during the twelfth Five Year Plan, from 2012 to 2017.

In the current context of new standards, advanced technologies, owner desired additions and changes, construction projects are becoming more and more complex. While the successful completion of projects has been thought to depend mainly on cooperation between the contractor, consultant, and owner, problems and disputes have always erupted due to conflicting opinions as to the various aspects of design and construction [1]. Construction industry in most of the countries is infamous for schedule and cost overrun, poor quality, large number of disputes, and many other ills and this is truer in case of

developing countries such as India [2]. There are significant time and cost overruns in projects across sectors, which lead to claims. Projects across different government employers suffer from cost overrun of 50-100 %, primarily driven by EoT (Extension of time). In the recent years, all of the stakeholders in the construction process have become increasingly concerned with construction claims. That is attributed to the fact that construction claims are found in almost every project. They are indispensable in the construction projects, and mostly in nowadays, where the substantially increasing volume of claims are the result of the rising complexity of the projects, the price structure of construction industry and the legal approach taken by a lot of owners and contractors [3]. In fact, there are few contracts in which there are no claims, negotiations and settlement before the contract is finally closed. However, financially strained Indian construction industry crisis are driven by unsettled claims such as 85% of claims raised are still pending and average settlement time is nearly 6 to 6.5 years. Employers always take awarded claims to courts to delay payments and courts normally uphold arbitrators' decisions.

Many research studies on claims and claim management are being conducted in the developed and developing countries on claims and claim management. However in India enough research studies are not reported on the above stated aspect. Hence there is a need to conduct a research in this area to understand in depth the root factors contributing to the generation of claims in Indian construction industry, to identify the most frequent claim types in Indian construction projects and to assist the

professionals in this industry for further development and growth in the management of future projects.

2. Literature Review

Scholars through the past years defined claims in different ways. Diekmann and Nelson [4] defined claims as the seeking of consideration or change, or both, by one of the parties to a contract based on an implied or express contract provision. According to Jergeas and Hartman [5], claim is the application by the contractor for payment that arises other than under the ordinary contract payment provisions. Adrian [6] classified claims into four major types: delay claims, scope of work claims, acceleration claims and changing site conditions claims. Zineldin [7] in his study in the Emirates of Dubai and Abu Dhabi using data from 124 claims, revealed that the types of claims in construction projects in UAE can be classified into six main types: contract ambiguity claims, delay claims, acceleration claims, changes claims, extra-work claims and different site condition claims. Chaphalkar and Iyer [8] in their study of a total of 52 arbitration awards in India found that, out of the 52 arbitration awards, 38 awards are pertained to delay related claims. Chaphalkar and Sandbhor [9] in their study of total 23 arbitration awards for Indian construction projects, a total of 419 claims leading to construction disputes were analysed. Their study indicates that 19% of the claims were variation claims, extra-work claims were 17% and escalation claims were 11% of the total number of claims studied.

Although the available literature on claims in India is less. The causes of claims have been investigated by many scholars worldwide. Claims for added costs and extended performance time can result from a variety of events during the course of a construction project. The claims may be those of the project owner, the prime contractor or by any of the project's trade contractors or suppliers. Diekmann and Nelson [4] have found that the most common causes for a contract claim are design changes and errors. A comprehensive analysis of claims indicated that 46% resulted from design errors. An additional 28% were due to either discretionary or mandatory changes. Thus 72% of all contract claims can be traced to design changes, extra work, and errors. Zineldin [7] in his study in the Emirates of Dubai and Abu Dhabi using data from 124 claims, revealed that the most frequent causes of claims in construction projects in UAE are: change orders, delay caused by owner, oral change orders by owner, delay in payments by owner. Abd El-Razek et al. [10] reviewed the causes of claims in the international literature and then modified these causes according to the Egyptian construction industry using semi-structured interviews with 10 experts. The modified list included 17 causes. Three case studies were utilized during their research to further investigate the occurrence of each cause in the project. They found that the most frequent causes were: variations initiated by owner/consultant, inferior quality of design, drawings and / or specifications, delays of approval of shop drawings, instructions and decision making and stakeholders involved in the project. Enshassi et al. [11] investigated 41 factors causing claims

in Gaza strip, under four categories: Owner related factors, design and bill of quantities related factors, contractual relationship related factors, and emergency cases related factors and the results revealed the main causes of claims were awarding bid to the lower bidder, border closures, residents' interference during project implementation and road blockage and difficulties in passing between cities and governorate. Al-Mohsin [12] studied 26 causes of claims in construction industry and collected data from 45 projects with specific criteria in Oman. He divided these factors into four categories based on the origin of claims: owner related factors, consultant related factors, contractor related factors and contract document related factors. Sibanyama et al. [13] during their study on causes of claims in the Zambian construction categorized 20 causes of claims according to the 4 phases of a construction project: pre tender; contract formulation; construction and post construction phases. Mohamed et al. [14] investigated 31 factors causing claims in Egyptian construction industry and concluded that the most disputable claim factors are extension of time, delay interim payment from client, qualification of team work, variations order by owner, poorly written contracts, late supply of equipment and material, incomplete drawings and specification and cooperation and communication nature.

3. Research Methodology

The study was fact-finding in nature which used a survey approach for data gathering to obtain the needed information for the study. A questionnaire was developed to assess the perception of the contractors towards the factors causing claims and the frequency of different types of claims. The questionnaire is divided into three main parts. Part one is related to general information for both the company and the respondent. Contractors were further requested to answer questions pertaining to their experience in the construction industry, specialization and the size of their organizations. The second part of the questionnaire focused on causes of claims, which includes 39 identified causes of claims in Indian construction projects. These causes are classified into the following six major groups according to the source of claim:

1. Owner/Owner's representative related factors: Owner personality, delay in handing over site, delay in payments to contractor, lack of staff experience for contract provisions management, excessive change orders by owner, delays of shop drawings approval by owner's representative, delay in approval of completed work, slow decisions from owner, acceleration and stop and go operation, and long line of authority in owner's organization.
2. Contractor related factors: Delay caused by contractor, poor planning and management by contractor, contractor's financial problem, poor quality of contractor's work, execution errors by contractor, and lack of control over sub contractor.
3. Contract documents related factors: Poorly written contract and ambiguities, variations between original and actual quantities, incomplete contract documents, design error or omissions, and different

types of contracts, and discrepancies between contract documents.

4. Project related factors: Change scope of the project, different sub grade conditions, complex execution of the project, and change location of the project.
5. Contractual relationship related factors: Lack of coordination and communication among parties, failure of participants to deal promptly with changes and unexpected outcome, termination of contract by one of party, suspension of work by one party, awarding bid to lowest bidder, and insufficient time for bid preparation and inadequate investigation before bidding.
6. External Factors: Force majeure, unexpected changes in exchange, interest, and inflation rate, unexpected change in material price, extreme weather conditions, unforeseen ground condition by all parties, changes in government regulations and laws, and stakeholder (beneficiaries, local community, authorities) interference.

The respondents were asked to indicate the degree of contribution of each factor to the generation of claims in Indian construction industry. The degree of contribution was categorized on a five-point Likert scale as follows: Very high, high, moderate, low, very low, on a 5 to 1 point scale.

Third part of the questionnaire was about the frequency of different types of claims in Indian construction projects. The eight types of claims identified were: delay claims, changes claims, extra-work claims, different site conditions claims, acceleration claims, disruption claims, contract ambiguity claims and price escalation claims. The respondents were asked to indicate the frequency of occurrence of each type of claim. The frequency was categorized on a five-point Likert scale as follows: Very frequent, frequent, medium, low, rare. on a 5 to 1 point scale.

The respondents were also asked to highlight their recommendations to minimize/mitigate claims in Indian construction industry.

The survey instrument was pilot-tested to measure its validity and reliability. The pilot study was conducted by distributing the questionnaire to two panels of experts having experience in the construction field to assess the questionnaire validity and provide constructive feedback. The first panel, consisting of 8 experts (owners, consultants, contractors), was asked to verify the validity of the questionnaire content and its relevance to the research objective. The second panel, consisting of two experts in statistics, was asked to confirm that the instrument used was valid statistically, and that the questionnaire design was well enough for the purpose of this research. Experts' comments and suggestions were accordingly incorporated to ensure the validity and reliability of the questionnaire.

The research was carried out in India, one hundred and seventy sets of questionnaires were distributed to the potential respondents at all levels in the contractor's organizations within the construction industry, and 117 respondents have been received. Though the sample size is relatively small, the quality of the responses was considered to be highly reliable for the analysis due to relevant industry experience.

4. Data Analysis

4.1. Calculation of Relative Importance Index

The suggested claim causes and types in Indian construction projects are ranked by the measurement of the relative importance index. The relative index techniques have been widely used in construction research for measuring attitudes with respect to surveyed variables.

Several researchers used the relative importance index in their analysis. Chan and Kumaraswamy [15] are of the opinion that the mean and standard deviation of each individual factor is not suitable statistics to assess the overall ranking because they do not reflect any relationship between them and accordingly they have used the "relative importance index" (RII) method to determine the relative ranking of factors. The RII is evaluated using the following formula:

$$\text{Relative Importance Index (RII)} = \frac{\sum W}{A * N} \quad (1)$$

$$= \frac{(5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1)}{5n}$$

Where w is the weighting given to each factor by the respondent, ranging from 1 to 5, (n_1 =number of respondents for weight 1, n_2 = number of respondents for weight 2, n_3 =number of respondents for weight 3, n_4 = number of respondents for weight 4, n_5 =number of respondents for weight 5).

A is the highest weight (i.e 5 in the study) and N is the total number of samples. The relative importance index ranges from 0 to 1.

5. Research Findings and Results

5.1. General Characteristics of Respondents

The questionnaire was sent out to a total of 170 contractors, to assess their perception in ranking the identified causes and types of claims in terms of their contribution and frequency using an ordinal scale. A total of 117 filled the questionnaire. The response rate is 69%. The respondents who are included in the survey have an average of ten years of experience.

5.2. Claim Causes

The causes under each group are ranked by the measurement of relative importance index according to Eq. (1). The ranking of relative importance index of the claim causes in Table 1 shows that delay in handing over site, variation between actual and original quantities, excessive change orders by owner, delay of shop drawings approval by owner's representative, and change scope of the project are the top significant factors. Moreover slow decisions from owner, delay caused by the contractor, delay in payments to contractor, design error or omissions, and unforeseen ground conditions by all parties are among the top ten factors. The following is a brief discussion of the ranking of the factors and groups as deduced in Table 1 and Table 2.

Table 1. Relative importance index and ranking of claim causes

Category	Causes of Claims	RII%	Rank
<i>Owner/Owner's representative related factors</i>	Owner personality	61.71	23
	Delay in handing over site	75.04	1
	Delay in payments to contractor	67.52	8
	Lack of staff experience for contract provisions management	60.68	27
	Excessive change orders by owner	71.28	3
	Delays of shop drawings approval by owner's representative	70.43	4
	Delay in approval of completed work	61.88	21
	Slow decisions from owner	67.86	6
	Acceleration and stop and go operation	62.22	19
	Long line of authority in owner's organization	63.08	17
<i>Contractor related factors</i>	Delay caused by contractor	67.52	7
	Poor planning and management by contractor	65.98	12
	Contractor financial problem	62.39	18
	Poor quality of contractor's work	56.07	37
	Execution errors by contractor	55.21	39
	Lack of control over sub contractor	58.80	34
<i>Contract documents related factors</i>	Poorly written contracts and ambiguities	65.98	13
	Variations between original and actual quantities	73.85	2
	Incomplete contract documents	61.71	24
	Design error or omissions	67.01	9
	Different type of contracts	59.49	31
	Discrepancies between contract documents	61.88	22
<i>Project related factors</i>	Change scope of the project	69.57	5
	Different sub grade condition	61.54	28
	Complex execution of the project	65.30	14
	Change of project location	55.56	38
<i>Contractual relationship related factors</i>	Lack of coordination and communication among parties	62.05	20
	Failure of participants to deal promptly with changes and unexpected outcome	60.85	26
	Awarding bid to the lowest bidder	66.32	11
	Termination of contract by one party	56.75	36
	Suspension of work by one party	57.78	35
	Insufficient time for bid preparation and inadequate investigation before bidding	64.96	15
<i>External factors</i>	Force majeure	59.66	30
	Unexpected changes in exchange, interest, and inflation rate	58.97	33
	Unexpected change in material price	63.76	16
	Extreme weather conditions	58.97	32
	Unforeseen ground condition by all parties	66.67	10
	Changes in government regulations and laws	59.66	29
	Stakeholder (beneficiaries, local community, authorities) interference	61.54	25

i) Owner /Owner's representative related factors

The result shows that the average of this group relative importance index is (RII=66.17%) with the first position of the rank order among the six groups as shown in Table 2. This means that this group is considered as the highest contributing group to the generation of claims in Indian constructions projects from the contractor's view. Five factors from this group are among the top ten significant factors, and they are: Delay in handing over site, excessive change orders by owner delay of shop drawings approval by owner's representative, slow decisions from owner and delay in payments to contractor.

Contractors consider delay in handing over site as one of the major issues in Indian construction projects. Most of the respondents agreed to consider this factor as the highest contributing factor to the generation of claims in Indian construction projects.

Excessive change orders by owner ranked at the third position, respondents agreed that this factor affects adversely the smooth implementation of the construction projects, and considered this factor as one of the main factors which is having a great impact on the budgeted cost of the project as it provides some of the most fertile grounds for the construction claims in Indian construction industry.

Table 2. Relative importance index and ranking of major claim causes categories

Category	RII(%)	Rank
Owner/ Owner's representative related factors	66.17	1
Contractor related factors	61.00	6
Contract documents related factors	64.99	2
Project related factors	62.99	3
Contractual relationship related factors	61.45	4
External factors	61.32	5

Delay of shop drawings approval by owner's representative is also one of the important factors in this group which is ranked at the fourth position and the respondents consider it as a highly important cause resulting in claims.

Slow decisions from owners is one of the significant factors which ranked at the sixth position. In most cases, slow decisions from owner, is due to lack of proper coordination and communication between owner and consultant or owner and contractor. So in this group the contractor's respondents showed the high significance of this factor in causing claims.

Delay in payments to contractor is also a troublesome to the contractors as construction works involve high daily expenses and any delays in the payments would cause financial difficulties to the contractor especially for those who are financially unsound, and it will affect the progress of the work and will lead to delays. These issues will push the contractor to request for compensation from the owner.

The bottom ranked factors were: Long line of authority in owner organization, acceleration and stop and go operation, delay in approval of completed work, owner personality, and lack of staff experience for contract provisions management. Most contractor's respondents agreed that these factors have a moderate impact and contribution to the generation of claims in Indian construction industry.

ii) Contractor related factors

Contractor related factors were the lowest ranked group with an average relative importance index value of (RII=61.00%) as shown in [Table 2](#). This group is considered as the lowest contributing group to the generation of claims in Indian construction projects from the contractor's perspective. The results show that the relative importance index for contractor related factors group has a short span; it ranges from 55% to 67%, which indicates that the contribution of causes to the generation of claims is ranging from moderate to high.

Contrary to what expected, respondents ranked delays caused by contractor at the seventh position. Most of the respondents agreed that this factor causes a big problem for both parties as it results in delays in the progress of activities and the whole project. Many causes contribute to the delays caused by contractor. And these causes could be delay caused by supervisor, delay caused by less experience of contract management by contractor, delay in mobilizing the resources, delay in material or equipment procurement or other issues. So the contractors agreed strongly that this factor causes big issues in their projects, which at the end will direct contractors requesting an extension of time as a result of these delays and if the contractor fails to complete the work in the required time, the owner is entitled to make a claim against the contractor for additional costs arising out of the contractor-caused delay.

Poor planning and management by contractor ranked at the twelfth position. Poor planning results in many planning errors and delays which at the end will direct contractors to submit claims requesting an extension of time or additional costs as a result of delays which might be excusable or non-excusable and also the counter claims

presented by the owner to recover losses due to delays in handing over project on time.

The latter factors: Contractor's financial problems, lack of control over sub contractors, poor quality of contractor's work and execution errors by contractor have a relative importance index span ranges from 55% to 62% which indicate that these factors have a less effective contribution to the generation of claims.

iii) Contract documents related factors

The results indicate that the average of group 3 relative importance index is (RII=64.99%) with the second position of the rank order among the six groups. This group is considered as the second highest contributing group to the generation of claims from the contractor's point of view.

Variations in quantities between original and actual quantities was the top ranked factor in this group and is considered as one of the main factors resulting in claims. When the variation between the estimated quantity and the actual quantity of a unit-priced item is more than plus or some agreed percent, an equitable adjustment in the contract price shall be made upon the demand of either the owner or the contractor. The contractor may request an extension of time if the quantity variation is such as to cause an increase in the time necessary for completion.

The respondents also ranked design error or omission at the ninth position. Most contractors agreed that this issue affects their activities and results in delay of the work progress and performance; in most cases, contractor requests changes order for the new drawing issued resulting from design errors or omission which in most of the time hinders the flow of the progress as planned and results in delays and disruption for the project activities leading to claims.

The respondents ranked poorly written contracts and ambiguities at the thirteenth position. Most contractors agreed that this issue affected them when ambiguities were found in the provisions of their contracts. It was found in some contracts ambiguous provisions led to misunderstanding between contractor and the owner's representative, which will end in a conflict leading to claims submission or disputes between the parties involved in the contract.

Incomplete contract documents, discrepancies between contract documents, and different type of contracts were ranked at the last in this group with relative importance index values ranges from 59% to 62% indicating the moderate impact of these factors in causing claims.

iv) Project related factors

This group of causes have an average relative importance index value of (RII=62.99%) with the third position of the rank order among the six groups as shown in [Table 2](#). The top ranked factor in this group is scope change of the project which in overall claim causes ranked at the fifth position. When a contractor's work is delayed or disrupted due to changes in the scope of the project, he will usually seek compensation to cover the unanticipated costs. So the contractors considered this factor as one of the most important factors causing claims in Indian construction projects.

The respondents ranked complex execution of the project at the fourteenth position. As in the current context of very complex and heavy budgeted projects initiated by the Indian government in the infrastructure sector, the claims became inevitable. So the contractor's respondents agreed to consider this factor as an important cause resulting in claims in Indian construction projects. The latter factors include different sub grade condition and change of project location.

v) Contractual relationship related factors

This group of causes have an average relative importance index value of (RII=61.45%) with the fourth position of the rank order among the six groups as shown in Table 2. The top ranked factors are awarding bid to the lowest bidder, and insufficient time for bid preparation and inadequate investigation before bidding. With respect to the first factor, the construction industry as a whole has been plagued by low profits and intense competition. As a result, if a contractor bids low enough to get the job, it cannot make a fair profit. If a contractor bids high enough to make a fair profit, it may be unable to get the job. These unpleasant alternatives place contractors in an extremely awkward position. And because of this approach, the contractors who bids low will seek compensation through claims. Sometimes, owners award bids to the lowest bidder, who are generally low qualified contractors who do not have the capacity to perform the required job which lead to poor performance and cause delay in completion of the work leading to claims against the contractors.

For the second factor insufficient time for bid preparation and inadequate investigation before bidding. Mostly in public works once funds are approved, owners are under constant pressure to get the construction under way. And they may be tempted to shorten the bidding process so that projects may be awarded and begun as soon as possible. As less time taken for adequate bid preparation, which forces the contractor to bid low without any pre-bid planning to win the bid knowingly that he will compensate his losses through the claim process.

The respondents ranked lack of coordination and communication among parties at the twentieth position. Coordination problems may lead to inefficiency in work or delay in work completion, thereby increasing the contractor's costs of work performance. Many contract claims and disputes arise from lack of coordination and good communication between the owner and the contractor or between the contractor and the subcontractors or suppliers during the time of bidding and during the execution of the project. So in this group the contractors showed the significance of this factor resulting in claims in Indian construction industry.

The bottom ranked factors were: Failure of participants to deal promptly with changes and unexpected outcome, suspension of work by one party and termination of contract by one party. Contractor's respondents agreed strongly that these factors are not highly contributing to the generation of claims in Indian construction industry.

vi) External factors

The result shows that the average of group 6 relative importance index value is (RII=61.32%) with the fifth

position of the rank order among the six groups as shown in Table 2. This group is considered as the second lowest contributing group to the generation of claims. The top ranked factor in this group unforeseen ground condition by all parties. Subsurface conditions involve many uncertainties and unknown factors. They are the greatest cause of claims and disputes. Even when extensive subsurface investigations are undertaken, the possibility of discovering differing site conditions still exists.

The respondents ranked unexpected change in material price at the sixteenth position. Most contractors agreed on the impact of this factor in causing claims. As it is drastically affecting the budgeted cost of their projects and eventually leads to claims to compensate their loss.

The respondents ranked the following factors: Stakeholder (beneficiaries, local community, authorities) interference, changes in government regulations and laws, force majeure, extreme weather conditions, and unexpected changes in exchange, interest, and inflation rate at the twenty-fifth, twenty-ninth, thirtieth, thirty-second and thirty-third positions, respectively. Contractors considered these factors of a moderate importance and contribution in causing claims in Indian construction industry.

5.3. Claim Types

The data collected from the third part of the questionnaire were analysed and the ranking of different types of claim based on their frequency shows the top ranked claim type is extra work claims. This means that extra-work claims are the most frequent type of claims in Indian construction projects from the contractor's point of view. Most of the contractors agreed to consider this claim type as the most frequent claim type in Indian construction projects.

The respondents ranked at the second position delay claims with a relative importance index value of (RII=75.38%). This indicates that the frequency of occurrence of delay claims in Indian construction projects is high.

The respondents ranked changes claims at the third position with a relative importance index value of (RII=75.21%). The contractors agreed that this type of claims occurred more frequently in Indian construction projects. The respondents ranked price escalation claims at the fourth position with a relative importance index value of (RII=73.16%). Most of the contractors agreed that this type of claims also occurs frequently in Indian construction projects, whereas the respondents ranked different site conditions claims and contract ambiguity claims at the fifth and sixth positions, respectively, with relative importance index values of (RII=62.39%) and (RII=60.17%), respectively. The contractors considered these types of claims have a medium frequency of occurrence in Indian construction projects.

On the other hand, the respondents agreed to rank disruption claims and acceleration claims at the seventh and eighth positions with relative importance index values of (59.15%) and (56.07%), respectively. Most contractor's respondents agreed that these two types of claims have a medium to rare frequency of occurrence in Indian construction projects.

Table 3. Relative importance index and ranking of claim types

Claim Type	RII (%)	Rank
Delay claims	75.38	2
Changes claims	75.21	3
Extra-work claims	81.54	1
Different site conditions claims	62.39	5
Acceleration claims	56.07	8
Disruption claims	59.15	7
Contract ambiguity claims	60.17	6
Price escalation claims	73.16	4

6. Conclusion & Recommendations

The paper investigated the causes and the frequency of different types of claims in Indian construction industry. A questionnaire was designed and distributed to the contractors. From the results, it was found that the most dominating claim group and source is owner/ owner's representative related factors and the top ten most causes contributing to the generation of claims are: Delay in handing over site, variation between actual and original quantities, excessive change orders by owner, delay of shop drawings approval by owner's representative, change scope of the project, slow decisions from owner, delay caused by the contractor, delay in payments to contractor, design error or omissions and unforeseen ground conditions by all parties. It can also be concluded from this study that extra-work claims are the most frequent claims type in Indian construction industry while delay claims were ranked second, disruption claims were ranked last, indicating that it is the least frequent claim type in Indian construction projects.

In accordance with these results, the recommendations set out from this research have been derived in a manner which makes them feasible, tangible and can be acquired as steps and procedures. Construction professionals may follow in order to avoid / mitigate and manage their claims. Furthermore, this study was conducted in India and the recommendations maybe generalized to an extent to construction projects within the same industry in India. The essential steps project parties can take to minimize/mitigate claims and deal with the aforementioned identified causes are:

- Most of the government contracts have a one sided clause, protecting only the interest of the owners. One-sided clauses in contracts should be avoided and well-drafted unbiased contracts should be adopted in Indian construction industry like FIDIC to reserve the rights of each party involved in the contract.
- Owners should ensure that they understand their duties and obligations under the contract and one of these obligations is to hand over possession of the site to the contractors in a timely manner.
- Owners and their representatives must define and freeze the scope of the work before tendering the documents. A complete set of plans and specifications with adequate details defining the scope of the project reduces the chances of frequent and subsequent changes and extra work claims.

- Legal and technical advice should be obtained before entering the contract to ensure that party's interests are properly and adequately reflected in the contract.
- Owners are advised not to rush the design. They should give the engineering firm and design professionals adequate time to complete and check and coordinate and complete the design, drawings and specification.
- Owners are advised to allow sufficient and enough time for bid preparation for the contractors and sub contractors.
- Allocate risk to the party best able to control and provide equitable rewards for assuming risks.
- Parties should read, study, review and understand the contract documents.
- Proper planning for all the project phases shall be prepared at early stage and coordinated with all sub-contractors.
- A dispute adjudication board (DAB) should be established from the beginning of the project.
- A joint effort between the parties to maintain good coordination and establishing effective communication channels with the all stakeholders throughout the project.
- Qualified staff in all aspects having a proper knowledge on contract provisions management.
- Owners are recommended to ensure timely response to the contractor requests regarding information, design clarification, approval of submittals or shop drawings.
- Parties should use suitable indexation for price escalations so this issue can be settled quickly and amicably between the parties.
- Owners should regularly and promptly release the bill of payments to the contractors for the work approved by the consultant.
- Owners are recommended to admit and accept the genuine claims of the contractor at an early stage without further delay, which in turn affects the cash flow of the contractors.

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