

Investigating the Major Causes and Impacts of Disputes in the Road Construction Projects: A Study of the Selected Projects of Pakistan

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Abstract— Due to the complex and competitive nature of construction projects, disputes are inevitable in these projects and road construction projects are no exception. If disputes are not managed or resolved properly, the performance of these projects is badly affected. Thus, it is paramount to investigate the major causes and impacts of disputes and related resolution approaches so that the preventative measures could be undertaken in this regard. This study has investigated the major causes and impacts of disputes and related resolution approaches in the selected road construction projects of Pakistan. This has achieved through descriptive research strategy taking sample data from client organizations (owners), consultants, and contractors and applying exploratory data analysis approach. The results reveal that the most significant causes of disputes are contract related followed by contractor related, and design related. The most important impacts of disputes are “additional expense in managerial and administration” followed by “time delays and cost overruns”. The most suggested technique for dispute resolution is “negotiation” followed by “mediation”. The results contribute to the existing knowledge-base and enhances academic rigor. The results also significant the practice as these point to the major causes and potential impacts of disputes which can hinder not only the performance of the projects, but also affect the credibility and reputation of the parties. The results elicited from this study can be helpful to resolve or reduce disputes in the road construction projects which further result in better quality, management of resources, time saving, reduced hostility, and decreased costs of the projects.

Index Terms— Causes of disputes in construction projects, construction industry, dispute resolution approaches, disputes in construction projects, impacts of disputes, road construction projects, road construction projects of Pakistan

1 INTRODUCTION

THE road construction projects are unique in the sense that these affect the social, financial and political life of the country. These are specific kind of projects in which a big funding is involved and the participants from different technical backgrounds, views, and opinions work together. However, due to the complex and competitive nature of the road construction projects, disputes are inevitable and adversely affect the infrastructure development of the country which further results in cost and schedule over-run along with stress and social un-rest created by the users and parties [1]. Disputes prevent the successful completion of construction projects [2], [3]. Construction projects require project managers with excellent project management skills to prevent and/or reduce disputes before these become very costly [4]. As disputes in construction projects have become the major concern to the parties, construction industry is striving on developing long lasting relationships among various parties to resolve disputes appropriately and expediently. Thus, it is paramount to have an insight into the various causes and impact of disputes and dispute resolution approaches in order to complete construction projects in time, within budget and according to specifications.

Pakistan is a developing country having interest to catch-up the market trends of other developing countries like India, Singapore, Malaysia, and Kenya etc. The real GDP of Pakistan is \$ 1.060 trillion with growth rate of 5.28% in which construction sector takes 9% of the GDP [5] which is a sign of growth of this sector and also the indication of growing economy. This

shows that Pakistan is increasing its capital in spending to manage infrastructure efficiently and effectively. However, the ability of managing disputes in the road construction projects efficiently and effectively may be different among successful and failed projects. It is paramount to combat rising disputes in the road construction projects in a cost-effective way. The most prevailing method in Pakistan to resolve disputes in the construction projects is the court of law which is very expensive and time consuming process. More efficient and effective mechanisms of dispute resolution should be in place to address rising disputes in the road construction projects of Pakistan. The implementation of these mechanisms requires a thorough investigation of various causes and impacts of disputes in these projects.

Although some studies have investigated the major causes and impacts of disputes and approaches of resolving disputes in the construction industry of Pakistan [6], [7], [8], road construction projects largely remained unexplored. This has created the need to conduct this study with specific focus on the road construction projects of Pakistan. Moreover, according to Public Procurement Regulatory Authority (PPRA), a large number of cases related to the road construction projects have been files at various judicial forums in recent years by the contractors. This is a vital concern as it affects the overall performance of construction industry in Pakistan [9]. This study fills this gap by investigating the major causes and impacts of disputes in the road construction projects of Pakistan and providing recommendations about how to resolve these disputes in a

more efficient and effective way. This has achieved through descriptive research strategy taking sample data from clients, contractors, and consultants in twin cities of Islamabad and Rawalpindi and applying exploratory data analysis approach to get credible results.

Following research questions are investigated in this study: What are the major causes of disputes in the road construction Projects of Pakistan? What are the potential impacts of disputes in the road construction Projects of Pakistan? How disputes are resolved in the road construction projects of Pakistan? How can disputes be reduced in the road construction Projects of Pakistan?

The introductory section is followed by the section of literature review. The third section presents the research methodology. The subsequent sections provide the results and discussion and conclusion.

2 LITERATURE REVIEW

2.1 Disputes in Construction Projects

Disputes in the construction projects occur at three phases: design phase, contract phase, and construction phase [10]. Design phase disputes occur due to incomplete, inaccurate, inconsistent, and uncoordinated civil, structural, electrical, and mechanical details and design specifications which can result in unexpected change orders. Contract phase disputes occur due to misunderstanding and lack of appropriate agreement between the client and the contractor on the type of contract or other variations in the scope, time, and cost. Construction phase disputes occur due to unforeseen site conditions, access to utilities, weather, and other working conditions. Causes or sources of disputes may be different in different countries, organizations, and projects, but by large, these are of similar nature with varying order of their importance and frequency of use. Contributors of disputes may also be different in different contexts and play an important role in dispute creation. Impacts of disputes may be varied from country to country depending on the context, but potential impacts influence the construction projects performance negatively everywhere. The dispute resolution approaches may be slightly varied depending on the country's law and system, but the frequency of their use and effectiveness may be largely different in different contexts.

2.2 Causes of Disputes in Construction Projects

Sinha and Woyal [11] argued that the roots of disputes in the construction projects lie in the contract document itself because tenders are often prepared hastily without paying proper attention to the necessary details. They described that proper details must be included so that the tender document become internally consistent in terms of provision of general and specific conditions and drawing and availability of specifications. Obviously, inconsistent, inaccurate, and incomplete details and information are the root causes of disputes in these projects.

Many researchers have investigated various sets/lists of causes of disputes in the construction projects. Rauzana [3]

found that main sources of conflicts and disputes in construction projects are social and cultural factors. Cheung and Pang [12] revealed that construction disputes are mostly contractual but also speculative. He added that in speculative disputes, the main trigger of disputes is people. Farooqui et al. [10] concluded the following reasons of disputes in the construction projects: ambiguities in specifications and drawings, vague contract documents, award of contract at low bid criteria, changes in design, issues of variations, and late payment issues resulted into claims. Isa, Ishak and Nor [13] identifies that vague documents, delays in the supply of material & equipments, and low profits are the major causes of disputes in the construction projects. Sheridan [14] found that valuation of financial accounts, valuation of variations, and payment provisions are the major sources of disputes in the construction projects. Mitropoulos and Howell [15] advocated that uncertainties in project, weak contracts, opportunistic behaviour, financial position of the contractors, cost of conflict, and culture are the reasons of disputes. Brooker [16] found that payments, delays, poor quality/defects, and professional negligence are the causes of disputes in the construction industry. Yates and Epstein [17] concluded that vague contractual documents, bad weather, variations, design information/drawings related issues, site possession delay, contractor appointment delay, and postponement of part of the project are the factors that lead towards conflicts in the construction projects. Kumaraswamy [18] revealed that variation in site conditions, clients requested variations, variations due to design errors, unanticipated ground conditions, vague contract documents, external events, interferences with utility lines, delay in site possession, delay in design information, and unexpected weather conditions are among the major causes of disputes in the construction industry. Conlin, Lanford and Kennedy [19] found that payments, delays, quality, performance, and negligence are the major reasons of the construction projects disputes. Heath, Hills and Berry [20] revealed that contract terms, variations, payments, time delays, nomination and re-nomination, and availability of information are the main sources of disputes in the construction industry. Spittler and Jentzen [21] found that vague contracts, competitive attitude, and dissimilar perceptions of fairness by the participants are among the various causes that create disputes in the construction projects.

Many researchers have also investigated the contributors of disputes in the construction industry. Gould and Capper [22] described three contributors of disputes in the construction projects: people related, process related, and product related. Rhys Jones [23] described dispute contributors into ten categories: management related, design related, communications related, culture related, tendering pressure related, law related, contract related, economics related, unrealistic expectations related, and workmanship related. Cakmak and Cakmak [24] concluded seven categories of dispute contributors in the construction industry which include owner related, contractor related, design related, contract related, human behaviour related, project related, and external factors. Similarly, Totterdill [25] described dispute contributors into the three categories: technical, legal, and managerial. However, Love, Ed-

wards and Smith [26] provided another view of the dispute contributors in the construction industry based on project management and people behaviour. They described three contributors of disputes in the construction industry: organizational management practices, project management strategy, and people (behaviour). Thus, causes of disputes in the construction projects can be categorized into various contributors to better understand them in project management perspectives.

2.3 Impacts of Disputes in the Construction Projects

The disputes in the construction projects put serious impacts not only on the performance of the projects, but also on the credibility, trust, and relationship among parties. Thobakgale, Aigbavboa and Thwala [27] described that disputes in the construction projects can cause long term damage to the rapport between the parties. They further added that projects may experience cost and time over-run, the client may suffer considerable loss and profit, and in worst cases projects may be abandoned or failed. Similarly, Rubino [28] concluded that disputes in the construction projects may influence cash flows, insurance, overheads, and reputation. However, Mashwama [29] provided a list of impacts of disputes in the construction projects which is shown in Table 1.

TABLE 1
IMPACTS OF DISPUTES

No.	Impacts
1	Additional expense in managerial and administration
2	Possibility of litigation cases
3	Loss of company reputation
4	Loss of profitability and perhaps business viability
5	Loss of productivity
6	Time delays and cost overruns
7	Extended and/ or More complex award process
8	Loss of professional reputation
9	Break down in cooperation between parties
10	Diminution of respect between parties and deterioration of relationship and break down in cooperation
11	Additional expense in administration
12	High tender prices
13	Rework and relocation cost for men, equipment and materials
14	Cash flow (Dispute affect insurance coverage and liability risk exposure).

2.4 Dispute Resolution Approaches

Although, there are many approaches to resolve disputes in the road construction projects but the most well-known and important approach is the resolution of disputes through the courts. When the parties belong to the same countries suffer disputes then the courts are established forums for them to resolve disputes. There are also many alternate dispute resolution (ADR) approaches to resolve disputes before moving the matter to the courts interventions [16]. However, in the perspective of the road construction projects, it is vital to adopt a

dispute resolution approach which is cheap, speedy, fair and just, mutually settled, binding, and with minimal negative impacts. ADR approaches are formal and informal procedures which are an alternative of litigation in courts. These approaches are considered to be less costly and speedy as compared to the litigation. A brief [16] overview of various ADR approaches is given here.

Arbitration: It is an adversarial approach in which the parties present the dispute before a neutral and impartial third party. This approach deals with the dispute resolution through a binding agreement or settlement between the parties. The advantages of this approach include awards are enforceable in courts and private parties can control the procedures.

Mediation: This approach is considered to an alternate of arbitration approach due to its non-adversarial nature. Mediation approach is a settlement of dispute through the involvement of an independent individual who assist parties in reaching settlement or agreement. This is a non-adversarial and consensual approach through which desired result can be achieved and encouraged as a prerequisite before litigation. Mediation approach provides many benefits including flexibility, confidentiality, cost effectiveness, reality testing, and relationship between parties.

Negotiation: This is a mandatory pre-trial or voluntary pre-hearing approach. This is usually a follow-up of the earlier negotiation between the parties but with newly appointed attorneys or representatives. When a negotiation is unsuccessful due to some reason, then it can be continued under the supervision of a trial judge. In negotiation approach, any agreement or settlement is only possible when both the parties agree. The success of negotiation depends on the expertise and attitudes of the representatives. However, it may avert trial if successful otherwise the dispute goes for litigation.

Conciliation: This is a non-binding agreement approach based on honour only. It is usually applied between large employers and trade unions for negotiation. However, it takes more time to reach at compromise between the parties because third parties are usually large associations. As compared to mediation, conciliation takes several sessions over many days or even weeks.

Adjudication: This is a speedy and economical approach to resolve disputes by the involvement of a third person known as Adjudicator which results in an immediately enforceable and non-binding dispute settlement. An Adjudicator is usually an expert but he can be a lawyer in some cases. This saves time and expenses. Opinion depends on whether adjudication is for claims of payments only or dispute arising under the contract. In most of the cases, adjudication is used for payment related disputes. However, it can be used for all matters including contract related matters.

Dispute Review Boards: This is a job-site adjudication process comprising of usually three neutral and impartial experts selected by the parties. The board periodically visits the site to monitor progress and potential problems. The board calls an informal hearing when the parties request for dispute resolution and issues an advisory opinion for the parties for further negotiation.

Expert Determination: This is an approach in which a dispute

is submitted to one or more experts by the parties to make a determination on the specific issue. The determination is binding agreement unless the parties agreed otherwise.

3 RESEARCH METHODOLOGY

3.1 Research Design and Method

Descriptive research design has applied due to the descriptive nature of this study and its research questions. A descriptive research design is suitable in situations when research questions start with what, how, who and when key words (Quinlan, 2015). A descriptive research determines and reports the way things are actually exist [31]. Moreover, survey research method has selected due to its greater external validity than case study research. Survey research method has the ability to generalize the results to the entire population whereas case study research has the ability to replicate the results to a limited extent [32].

3.2 Population and Sample

The study population consisted of completed and partially completed road construction Projects of Pakistan. The sampling frame was the Ministry of Planning, Development and Reforms that provided the list of infrastructure development road projects. The projects completed within the last five years and currently under completion formed the study population. A sample of ten (30) projects was selected. The respondents were mainly client organizations, contractors and consultants (Engineers). The unit of analysis was the individual. The cluster sampling technique was applied to get meaningful data and possibility of generalization of the results. A total of sixty (60) questionnaires were sent to respondents. Ten (10) questionnaires were sent to client organizations, Thirty (30) were sent to contractors and twenty (20) were to consultants.

3.3 Data Collection Technique

A survey questionnaire was developed by adopting items from the prior studies. The sources of items are given in the next section along with the structure of the questionnaire. Survey questionnaire is the most simple and efficient way to collect meaningful data (Fowler, 2002). Survey questionnaires are considered as the most effective to reach large number of respondents in short time to gather large volume of data in an economic way [32]. The data collection process started in December 2018.

3.4 Measurements

Adopted instrument was used to investigate the causes and impacts of disputes and dispute resolution approaches in the

road construction projects. However, some minor modifications were made after the consultation with the two construction industry experts. The data collection instrument contains four sections. Section A deals with the respondents profile, section B deals with the guiding items for causes of disputes, section C deals with the guiding items for impacts of disputes, and finally section D deals with the guiding items for dispute resolution approaches. The items of section B were adopted from Cakmak and Cakmak [24], section C from Mashwama [29] section D from Carmichael [33]. All items were measured on "five point Likert scale from 1 (Strongly Agree) to 5 (Strongly Disagree)".

3.5 Data Analysis Approach

Data were analyzed through exploratory data analysis approach. Exploratory data analysis is an approach used to analyze quantitative data. In exploratory data analysis, quantitative data sets are analyzed through statistical tools to comprehend the important characteristics of the data sets [31]. In this study, MS Excel was applied to analyze the collected data due to its ability for quantitative data analysis and presenting data in terms of tables, graphs and charts.

4 RESULTS

4.1 Sample Characteristics

A total of 60 valid questionnaires were returned from the respondents. In this way, the response rate was 100 %. This was due to the fact that the researcher who is also a construction claim administrator used his professional and personnel links to gain 100% response rate. The sample characteristics are shown in Table 2 which show that most of the respondents were contractors (50.00%) followed by the consultants (33.66%) and client organizations (16.67%). This was due to the nature of the cluster that was designed before the data collection phase because there are always less number of client organizations than the consultants (engineers) and the contractors. The sample characteristics further show that the average (median) experience of the respondents was 12 years (with maximum value of 38 years and minimum value of 5 years, although, not shown in Table 2) which is considered good for gaining meaningful data for credible results. As for as, the academic qualification of the respondents was concerned, majority of the respondents were bachelor degree holders (35 out of 60) followed by master degree holders (20 out of 60). Only 5 respondents were without any university level degree but these were included based on their experience in the construction industry.

TABLE 2
SAMPLE CHARACTERISTICS

	Frequency	Percentage
Client organizations	10	16.67
Contractors	30	50.00
Consultants	20	33.33
Experience	Median	
Experience (in years)	12	
Academic qualification		
Master	20	
Bachelor	35	
Others	5	
Age		
Less than 25 Years	0	
25-30 Years	2	
31-40 Years	30	
41-50 Years	22	
Above 50c Years	6	

4.2 Major Causes of Construction Disputes

The responses on major causes of construction disputes were analyzed under various categories. The results are shown in Table 3. The results demonstrate the mean (μ), standard deviation (O) and coefficient of variance (O / μ) of the major causes of disputes. The results indicate 23 causes of disputes under seven categories. The causes of disputes whose mean (μ) score is not according to their coefficient of variance (O / μ) have been dropped from the list. The category-wise analysis shows that the most of the causes are owner related, contractor related, contract related and design related. However, fewer causes of disputes are project related, human behavior related and external factors. Moreover, the results indicate that “ambiguities in contract documents” shows the lowest coefficient of variance (O / μ) score which is 0.06 followed by “late giving of possession”, “delays in work progress” and “design errors” which show coefficient of variance (O / μ) score of 0.09. This shows the importance of these causes in the studied environment. The decreasing order of mean (μ) score with increasing order of coefficient of variance (O / μ) indicates that the results are valid and reliable. The coefficient of variance (O / μ) is considered as an effective measure as compared to the mean (μ) and the standard deviation (O). It provides more accurate measure of data analysis than simple mean (μ) and standard deviation (O). Therefore, the researcher adopted this measure to complement the other measures for establishing the validity and reliability of data. As a result, some causes of disputes which have presented in the questionnaire but not related to the study environment have automatically dropped after the process of data analysis because their coefficient of variance (O / μ) did not support their mean scores. However, the results in Table 3 provide only the category-level view rather than the overall view of the major causes.

TABLE 3
MAJOR CAUSES OF DISPUTES

Dispute category	Causes of dispute	Mean (μ)	Standard Deviation (O)	Coefficient of variance (O / μ)
Owner related	Late giving of possession	4.78	0.42	0.09
	Variations initiated by the owner	4.30	0.46	0.11
	Change of scope	4.15	0.73	0.18
	Acceleration	3.07	0.73	0.24
	Unrealistic expectations	3.08	0.74	0.24
Contractors related	Delays in work progress	4.77	0.43	0.09
	Time extensions	4.65	0.63	0.14
	Technical inadequacy of the contractor	4.53	0.50	0.16
	Financial failure of the contractor	4.50	0.50	0.16
Design related	Design errors	4.78	0.42	0.09
	Inadequate / incomplete specifications	4.75	0.47	0.10
	Quality of design	3.65	0.61	0.17
	Availability of information	3.38	0.64	0.19
Contract related	Ambiguities in contract documents	4.90	0.30	0.06
	Different interpretations of the contract provisions	4.68	0.47	0.10
	Risk allocation	4.30	0.72	0.17
	Other contractual problems	4.08	1.08	0.26
Human behavior related	Lack of team spirit	3.57	0.83	0.23
	Adversarial / controversial culture	3.22	0.92	0.29
Project related	Site conditions	3.33	0.60	0.18
	Unforeseen changes	3.25	0.60	0.18
External factors	Legal and economic factors	4.10	0.57	0.14
	Weather	3.40	0.85	0.25

Figure 1 shows the ranked list of various categories of causes of disputes. The results demonstrate that the contract related causes indicate the highest mean score. It means contract documents are the main source of disputes in the road construction projects of Pakistan. Moreover, the contractor related causes indicate the second highest mean score which is slightly lower than the contract related causes. It means contractor related causes are also the main source of disputes in the road construction projects of Pakistan. Furthermore, design related causes indicate third highest mean score which means design related causes are another source of disputes in the road construction projects of Pakistan. However, project related causes demonstrate the lowest score as compared to the other categories. It means project related matters are comparatively well managed in the studied environment.

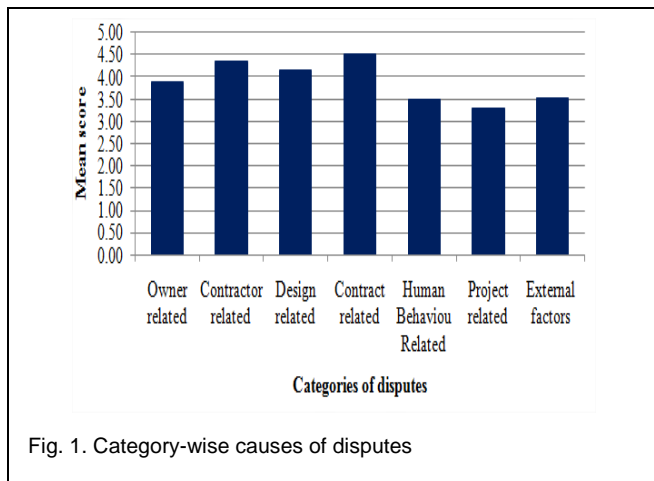


Fig. 1. Category-wise causes of disputes

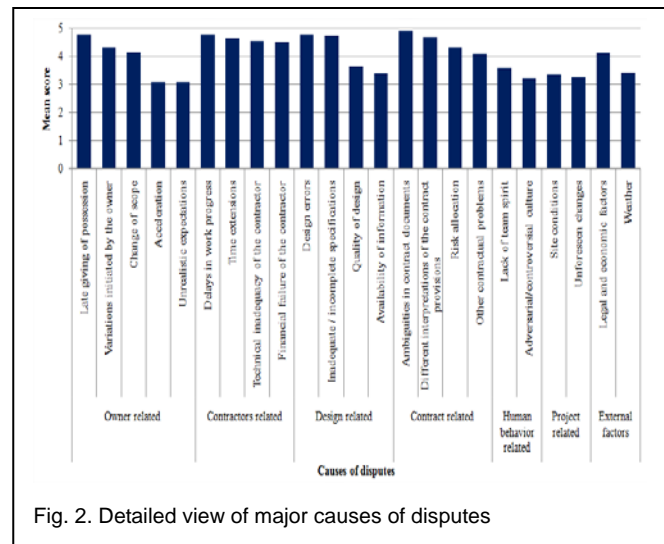


Fig. 2. Detailed view of major causes of disputes

Figure 2 provides the detailed view of the major causes of disputes in the road construction projects of Pakistan. The results reveal that the highest cause of disputes is the “ambiguities in contract documents”. This shows that the contract documents among parties are prepared hastily without going into proper detail and gathering all relevant information. This cause deals with all the parties in the contracting process including the owner, contractor and consultant. Therefore, all the parties are responsible to address this main cause of disputes. The second highest causes of disputes are the “late giving of possession” and “design errors”. The respondents provided equal scores to both these causes. It means these two causes contribute equally towards the disputes in the road construction projects of Pakistan. The former cause belongs to the owner and later belongs to the design, where again all three parties are involved in the designing process. However, most of the responsibility lies on the consultant and contractor who are responsible for the clear designs. The other top causes of disputes include “delays in work progress” which belongs to the contractor, “inadequate/incomplete specifications” which belong to the design, “different interpretations of the contract provisions” which belong to the contract itself and “time extensions” which belong to the contractor. Some of the causes demonstrate comparatively lower score than the others. These include “lack of team spirit” and “adversarial/controversial culture” which belongs to the human behavior, site conditions and unforeseen changes which belong to the project and “weather” which belong to the external factors. All these causes demonstrate mean score less than 4.00. It does not mean that these causes less contribute towards disputes and should be ignored at all. These causes may have more serious impact under other conditions. The results also reveal that most of the causes of disputes are owner related followed by the contract related, contract related and design related. However, less number of causes of disputes are project related, human behavior related and external factors related.

4.3 Potential Impacts of Disputes

The response of the respondents on the potential impacts of disputes in the road construction projects of Pakistan is shown in Figure 3. The results indicate that the most important impact of disputes in the road construction projects is the “additional expense in managerial and administration”. The respondents provided 96 percent score to this impact. It means disputes result into increased costs in terms of managerial and administration expenses. These additional expenses may be in the form of extra work and documentation. Moreover, “time delays and cost overruns” revealed as another serious impact of disputes. The respondents granted 92 percent score to this impact. It means when dispute occurs, it delays the road construction projects which further leads towards increased costs due to delay in the project. The performance of the project is badly affected due to the disputes and even project is halted in some circumstances because future of the project becomes uncertain especially due to serious disputes among the parties. When disputes are not resolved by the parties themselves or through some alternative methods, then ultimately the matter goes to the court of law. Therefore, “possibility of litigation cases” revealed as another adverse impact of disputes in the study environment. The respondents provided 91 score to this impact which shows its criticality in the study environment. The “loss of profitability and perhaps business viability” found to be another impact of disputes in the road construction Projects of Pakistan. This impact gained 88 percent score from the respondents which show its criticality in the road construction projects. When disputes occur, the profit decreased due to the additional expenses involved and extra costs incurred and some time business viability becomes questionable. This is the worst impact of disputes which put serious threat to the survival of the business. Sometimes, organizations have to start from scratch due to serious disputes. Therefore, “rework and relocation cost for men, equipment and materials” revealed as one more impact of disputes in the

study environment. This impact gained 87 percent scores from the respondents. Due to disputes, the project may be halted and project team may be withdrawn from the project up to the resolution of dispute. When dispute are resolved then project team is relocated to complete the remaining work as per new conditions. The overall results indicate that nine impacts of disputes gained 80% or greater scores which made them critical in this environment. Therefore, nine impacts of disputes are more critical in this environment.

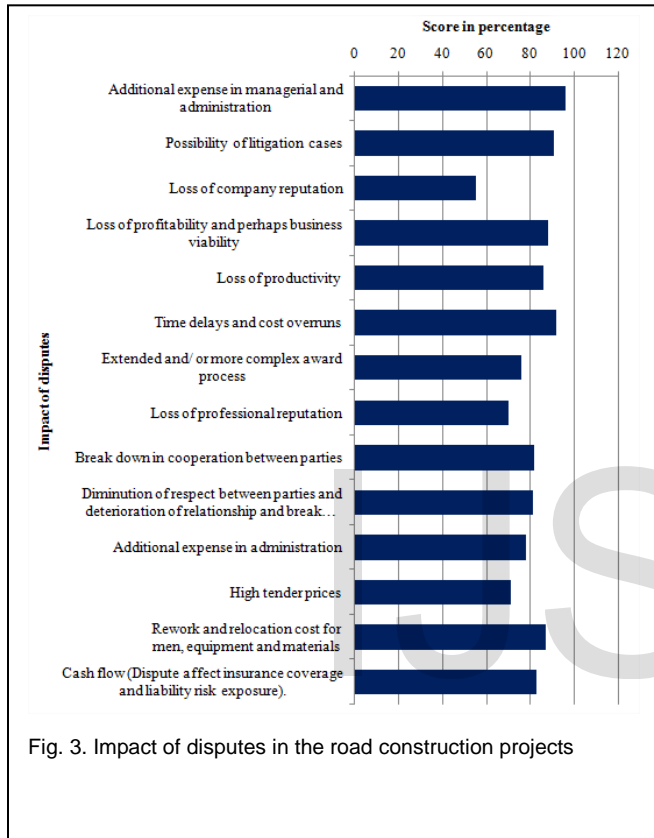


Fig. 3. Impact of disputes in the road construction projects

4.4 Dispute Resolution Approaches

Figure 4 shows the responses on the dispute resolution approaches in the road construction projects of Pakistan. The results reveal that negotiation is the most significant dispute resolution technique because 55 percent respondents were in favor of this technique. Negotiation is followed by the mediation because 48 percent respondents prefer this technique. Mediation is followed by the arbitration because 45 respondents adopt this technique. Arbitration is closely followed by the conciliation which is further closely followed by adjudication. However, only 15 percent respondents are in favor of export determination, 21 percent are in favor of litigation and only 3 percent respondents are in favor of other dispute resolution technique. This shows that negotiation is considered to be the most favorite technique of dispute resolution in the road construction projects of Pakistan. Alternate dispute resolution is considered to be the second best choice. However, litigation is not considered to be the best choice for dispute resolution because it involves a lot of cost in the form of law-

yers' fees and lengthy court procedures. Which technique is more appropriate for which type of dispute is not by choice rather by compulsion? A single party cannot decide which resolution technique should be adopted rather it depends on the mutual understanding among the parties involved in the disputes.

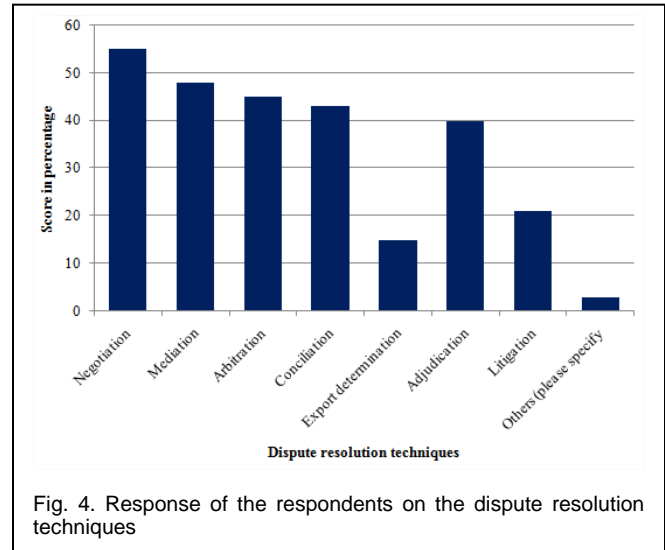


Fig. 4. Response of the respondents on the dispute resolution techniques

4.5 Discussion

When the response was analyzed on the major causes of the disputes, the results revealed that the most important causes of disputes were contract related. This might be due to the fact that contract documents are prepared in haste without pondering upon necessary details and information. When contract related causes of disputes were further analyzed at cause level, then it was found that "ambiguities in contract documents" is the most significant cause of disputes followed by the "different interpretations of the contract provisions", "risk allocation" and "other contractual problems". It means contract documents are usually vague and parties make their own interpretations which are in their interests. Therefore, it is highly recommended that contract documents should be prepared professionally and clearly by covering all major and minor details. Third party services (legal opinions) can also be hired for this purpose. The results revealed that second most important causes of disputes were contractor related. This might be due to the fact that most of the disputes occur between owner and contractor. Contractor submits the claim and when claim is rejected by the owner then it turns into dispute. When the analysis was made at cause level, then it was found that "delays in work progress" was found to be the most significant cause of disputes followed by "time extensions", "technical inadequacy of the contractor" and "financial failure of the contractor". It means delays in work progress by the contractor initiates disputes among the parties especially between owner and contractors. Delays in work progress not only affect the overall cost of the road construction projects but also create economic and social upset for the community. When the response of the respondents was analyzed on the impacts of

disputes, the results revealed that the most important impact of disputes was "additional expense in managerial and administration". This was also supported by the study of Cakmak and Cakmak [24] who found that this impact was at top of the list. One possible reason might be the fact that when disputes occur in the road construction projects, then expenses increase in terms of additional documentation, meetings, litigation costs and arbitration etc. The second most important impact of disputes was "time delays and cost overruns". When a project is delayed, the costs related to the salary of employees and other resources like hired machinery and plants are increased. Therefore, to circumvent additional project costs, disputes should be avoided in the projects. Many other potential impacts of disputes were also revealed with order of their importance. All these impacts are unfortunately negative for the smooth flow of the road construction projects. Therefore, parties should take special care of the disputes in the road construction projects if they want to complete these projects in time, within budget and according to specifications.

When the response of the respondents was analyzed on the dispute resolution approaches, the results revealed that the most respondents preferred "negotiation" among parties. Negotiation is considered to be a best dispute resolution technique because it not only maintains the rapport between the parties but also develops give and take situation among parties. Through negotiation, the long and expenses process of litigation can be avoided. The second most preferred choice of the respondents was "mediation". Mediation involves a third party which assists in settling disputes among the parties. It is also considered as a cost-effective technique to resolve disputes. Many other disputes resolution approaches were also suggested by the respondents with their order of importance in the study environment. However, which technique is more suitable in which circumstances depends on the will of the parties to resolve disputes.

Implications for Practice: The findings of the study can assist the owners (clients), contractors and consultants to recognize the major causes and potential impacts of disputes which adversely affect the performance of the road construction projects. Due to the ranking order and relative importance of the major causes of disputes, potential impacts of disputes, and disputes resolution approaches, they can use the results to prioritize their scarce resources. They can identify weak areas where time and resources can be invested for sustainable success. The results can help them to review and update their existing strategies and plans regarding dispute resolution. As most of the causes of disputes are similar in other types of construction projects, the findings of the study can be extended to the other types of construction projects.

Implications for Theory: The study adds into the existing knowledge-base through a new and updated set of causes and impacts of disputes in the road construction projects. The results complement the findings of the previous studies in other countries, especially developed countries. The study not only creates awareness about the disputes in the road construction projects in a developing country like Pakistan, but also provides new avenues for future researchers who want to do research in this field. The finding of the study can be used to develop

on a dispute resolution strategy or framework for the road construction projects. Other developing countries which are operating in similar circumstances like Pakistan can also take the advantage of this study. Figure 4 shows the responses on the dispute resolution approaches

5 CONCLUSION

The study investigated the major causes and impacts of disputes and related dispute resolution approaches in the road construction projects of Pakistan. The results revealed a ranking list of disputes in seven categories according to their importance in this context. Moreover, the results provided a ranking list of the impacts of disputes. Furthermore, the results highlighted preferred dispute resolution approaches applied in these projects. Due to the relative importance of causes, impacts and resolution approaches of disputes, owners, contractors, and consultants can prioritize their plans and strategies for successful resolution of disputes.

The study provides several recommendations for the future researchers. Future researchers should also sought qualitative opinions of the respondents in the road construction projects of Pakistan to have more insights into the various aspects of the disputes in this industry. Qualitative response provides more detailed view and credible results. When quantitative view is complemented with qualitative opinion, it covers the weaknesses of one method and provides the strength of other method. Moreover, future researchers should involve more respondents even from other types of construction projects like building and dams to depict a comprehensive picture of disputes in the construction industry of Pakistan. In this way, the results can be more generalized to the overall construction industry of Pakistan. Future research can also investigate the statistical effect of identified causes on the performance of the road construction projects of Pakistan. They can also develop various research models and frameworks based on the findings of this study for further investigation of the phenomenon of disputes in this industry.

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