SUBCONTRACTING PRACTICES– CONTRACTUAL RELATIONSHIP AND DISPUTE RESOLUTION

by

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MY PARENTS & SIBLINGS

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Muhammad Umer Zubair

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ABSTRACT

Disputes are found to be very common in the construction industry. It has been reported that the amount spent in resolving disputes through litigation is US $5 billion annually in the United States. This study is focused on the causes of disputes in the construction industry with special emphasis on those between the contractor and subcontractor in the local and the international construction industry. For identifying the causes of disputes in literature a three step content analysis approach was used to analyze the data from the research papers retrieved from selected journals and conference papers. The top five causes of disputes identified through literature review include delays in payments, change orders, quality of works, delays in work and contractual anomalies. A survey conducted in the local market indicated that delays in payments, poor quality of works, delays in works, poor contractor selection and change orders are the critical cause of disputes in the local construction industry. A second survey was conducted globally to determine the causes of disputes between the general contractor and the subcontractor. A similar trend has been observed in Developed countries, Middle East and South Asia subcontractor's relationship where delays in payments, delays in work and poor quality of works are the critical causes of disputes. Afterwards a third survey was carried out to determine the recommendations for the general conditions of subcontract in Pakistan. The questionnaire was developed on the basis of conditions of subcontract proposed by various international organizations. The conditions selected by most of the respondents were carried forward to the legal experts for which semi structured interviews were conducted. Based upon these interviews 36 suggestions were made. Through these suggestions 19/20 disputes can be addressed

CHAPTER 1

INTRODUCTION

1.1 A WORD ON CONSTRUCTION INDUSTRY

Construction Industry contributes to economic growth all over the world. It provides job opportunities to the skilled, semi skilled and unskilled labor force. The impact of construction towards the economy can be witnessed in the developed countries where it is considered to be a driver in improving the economy. The construction industry can generate jobs for the people, helps in creation of improved infrastructure, better housing facilities and therefore causing uplift in the life style of the people (Anaman and Osei-Amponsah, 2007). The development in the construction industry leads to progress in various other industries that ultimately contributes to overall wealth of the countries. Hence construction can be regarded as a significant part of any country's economy and growth (Field and Ofori, 1988). According to International Labor Office report in 2001 the output from construction industry has been found over $3000 billion in 1998. About 77% of this revenue generated lies in the high income countries like Western Europe, North America, Japan and Australasia while only 23% is found in low income countries. The employment status is a reverse of the output ratio. In the high income countries the employment provided is 26% of the total employment while in low income countries it is 74%. Therefore the conditions in the working environment of the low income countries is required to be improved so that the output could be increased in the areas having a large workforce working in the construction sector.

In Pakistan, the situation is pretty unfortunate where Construction contributes only 2.3% to the GDP (State Bank of Pakistan 2010). 5.5 % of the total employed work force in Pakistan is hired by the construction industry (Economic Survey 2004-2005). Khan (2008) studied the role of construction

industry in the economic growth of Pakistan. He determined that there is a strong linkage between the economic growth and the progress in the construction industry. With the improvement in the construction industry the GDP rate increases. Construction industry widely contributes to the aggregate economy of Pakistan. Therefore the factors that impact the output of the construction industry are required to be effectively managed. According to Aslam (2013) the reasons for the problems in construction industry are changes in prices of raw and manufactured material, high cost of machinery, lowest bidding practice, poor cost control, long gaps between the bidding and design phase, poor estimation practices, reworks and additional works, improper planning and inappropriate government policies. To obtain the prospects associated with the construction industry proper management practices in this field is required.

1.2 AN OVER VIEW OF SUBCONTRACTING

Subcontracting is a process where a firm contracts with the main contractor to perform a part of general contractor's work (Clough et al., 2015). Specialty contractors are hired to perform specific tasks on the project like plumbing, air conditioning, steel erection, formwork erection etc. The subcontractors are more specialized in executing specific tasks (Gunderson and Cherf, 2012). The construction field is diverse and consists of variety of tasks. The main contractor cannot master all of those tasks. Therefore the main contractor subcontracts their work to other parties and in many cases, the whole of the work is subcontracted and the main contractor only plays a role of a construction manager. Subcontracted works account to 70% of the total project (Al-Hammad, 1993). According to Hinze and Tracey (1994), on numerous building projects the subcontracted works constitute 80 to 90% of the works and the general contractor performs the duty of guiding the subcontractors. A similar practice has been observed by Mbachu (2008) that 85% of the construction project in building industry is handled by subcontractors. Abundant practice of subcontracting is also reported in numerous other countries, including the UK (Flanagan, 1989) and Japan (Kimura, 2002). This shows that in today's world the contractor in concentrating more towards transfer of specialized tasks to the specialty contractor. Therefore the successful

execution of projects depends upon the performance of subcontractors (Mbachu, 2008).

A major reason behind subcontracting is the decentralization of risks by the general contractor. By hiring the subcontractor the main contract attempts to minimize their risk and tends to transfer the works to the parties that are more specialized in executing those tasks. This not only leads to reduction in risks associated with the project, but the chances of gaining profits are increased as well (Ng et al., 2003). Oliver (1997) stated that since the construction market is fluctuating, so in order to deal with the risks associated with the sporadic conditions, general contractors subcontract the work and it leads to reduction in financial and technical risks for the contractor. Other authors like Gunderson and Cherf (2012) and Elazouni and Metwally (2000) consider factors like transfer of risk, cost cutting and utilization of specialized work force to be the reason behind subcontracting. However, if subcontractors fail to perform they become another risk for the project. The problems in that case exceed the benefits obtained from subcontracting.

Major advantages associated for the general contractor with the subcontracting include lesser direct workforce and the additional costs due to delays may be borne by the subcontractor (Ng et al., 2003). Contractor cannot hire individual work force for each of the specific trades and incorporation of subcontractor work force has been proved to be economical in terms of available resources (Arditi and Chotibhongs, 2005). Since the quality of final product depends upon the works executed by the subcontractor, the main contractor should be concerned about the selection of the subcontractors. The subcontractors were selected solely on the basis of price in the past but after the report “Constructing a team” submitted by Latham (1994) many authors have suggested alternate criteria for the selection of subcontractors. The main contractor wants the subcontractor to be competent in the following five domains (Gunderson and Cherf, 2012).

- Quality of works executed
- Executes work reliably and is responsive to the queries
- Communication
- Managerial and Technical Capabilities

- Pre Construction Services

The relationship between the main contractor and the subcontractor is adversarial since both parties try to look out for their own interests. The main contractor carries considerable amount of risk which he wants to transfer to the subcontractor and at the same time, the main contractor aims at full filling his own contractual obligations (Greenwood, 2001). The effective management by the main contractor can reduce the intensity of adversity in this relationship. Due to adversity in the relationships disputes are pretty common in the construction industry. The disputes can lead to inferior quality, cost over runs, project delays etc and severely impact the project. Enshassi et al. (2012) enlisted the factors that cause interface problems between the Contractor and the Subcontractor. These include assigning part of subcontracted works without informing subcontractors, financial problems, delay in payments, delay in provision of materials by the main contractor, low experience of main contractor, failure to use insurance, interaction among subcontractors leading to delay of work, delay in shop drawings ad material approval, delay in activities, partial understanding of contract by the main contractor, provision of inferior quality of material, selection of subcontractor based on lowest price only, failure to provide subcontractor with necessary utilities, conflicts in scheduling, interruptions and termination of work, lack of proper security, distant material storage place, absence of main contractor from site and involvement in multiple projects at the same time by the main contractor. These issues can be addressed without any impacts on the project if the roles and responsibilities of the subcontractor and contractors are well defined, frequently occurring problems on site and the procedures to resolve disputes are pre determined in the general conditions of the contract. There are no standard subcontractor agreements in Pakistan. The contractor some time uses their own forms of contract that contain onerous conditions (Choudhry et al., 2012). Therefore a standard contract that can address these issues is required.

To further transfer their risks and to hire less direct workforce these days the practice of sub subcontracting the works is also pretty common in the construction industry. The subcontractor transfers the works to the lower tier subcontractors. The responsibility of the management of these sub sub contractors

lies with the subcontractor. The practice of sub subcontracting was virtually nonexistent twenty five years ago but these days due to scarcity of skilled workforce this practice is very common. The subcontractors tend to increase their profits by hiring the sub subcontractors (Markowitz, 2007). Nowadays the subcontracting is very important in the construction industry. If managed well it brings fruitful results for the projects. To obtain the benefits associated with the subcontracting an understanding of the management practices in this field is required.

1.3 LEVEL OF RESEARCH ALREADY CARRIED OUT

A research on the major causes that leads to interfacing problems between the Subcontractor and Contractor has been done by Al-Hammad (1993) and Enshassi et al. (2012). Other than this, various researches have been done in various parts of the world to determine the disputes in the construction industry including a research by Farooqui et al. (2014) to determine the causes of disputes in Construction industry of Pakistan. A research to determine the subcontractor practices in Pakistan has been carried by Choudhry et al. (2012). Little research has been carried out in the past to determine the interface problems between the general contractor and the subcontractor. In Pakistan no study has been carried out on the subject topic.

1.4 OBJECTIVES OF THIS STUDY

This study will cover the following objectives

- To collect the causes of disputes in the construction industry through literature
- To rank the impact, probability and the risks of these factors
- To analyze various international subcontracts
- To make recommendations for the general conditions of contract between the general contractor and subcontractor
- To validate these suggestions

1.5 SCOPE OF STUDY

This study will target the construction professionals not only in the local industry but international industry as well. This will lead to a comparison in the point of view of the respondents of the Pakistani and those working in the international market. The recommendations regarding the general conditions of subcontract will target the local industry only.

1.6 SIGNIFICANCE OF THESIS

The research will identify the causes of disputes worldwide so that they can be avoided beforehand. The subcontractors are a significant portion of the construction industry. This research will target their critical issues. Also recommendations will be made for the general conditions of subcontract that will propose a framework for both parties.

1.7 LAYOUT OF THESIS

Chapter 1 provides the introduction, significance and objectives of the research. Chapter 2 gives details of the literature review. The root causes of the disputes are identified and the stance of various international subcontracts on critical issues is presented. Chapter 3 explains the methodology of research while 4^{th} will give details of data analysis and results. Chapter 5 summarizes the research with conclusions and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 DISPUTES IN COSNTRUCTION INDUSTRY

Construction industry is getting complex day by day. It is riddled with dynamism and uncertainties owing to multidisciplinary nature of projects and stakeholders. Owing to the diversity, differences of opinion are bound to occur which may escalate to conflict (Jha and Jha, 2010).Some authors suggest that a minimum level of conflict is beneficial for the organization. Moderate levels of conflict create satisfaction for the project participants. However, if the intensity of conflicts increases, it creates an environment of tension and the performance declines as a result(Hughes, 1994; Gardiner and Simmons, 1995) harming the positive impacts of conflicts (Leung et al., 2005).

The construction industry being a multiparty operation venturing into temporary undertakings is no different when it comes to conflicts (Nyarko, 2014; Ankrah and Langford, 2005).The interaction of several parties like architects, engineers, constructors, skilled and semi-skilled labor, financiers, owners, developers, etc. may lead to inevitable conflicts which can quickly turn into disputes(Cakmak and Cakmak, 2014; Kishor Mahato and Ogunlana, 2011).These disputes can take place at any phase of the construction project i.e. during the design or execution (Hall, 2002).

The construction industry consists of three prime stakeholders that include owners, architects and contractors. The contractors are supported by various subcontractors and suppliers. By virtue of their function, magnitude and role, there is a huge amount of difference among the interests of these parties which may give rise to disagreements (Mitkus and Mitkus, 2014). The owner is interested in getting a quality facility as economical as possible. The consultant wants to show their creativity and contractual compliance while the contractor tends to deliver the project in a timely and economical manner such that the owner is satisfied against a handsome profit margin (Acharya et al., 2006). Having different set of goals, the

environment poses great potential for adversaries among the project parties which becomes the root cause of conflicts and disputes (Ng et al., 2007; Kassab et al., 2010).These diverse people, the process to achieve the objective and the final deliverable are at the foundation of disputes (Diekmann and Girard, 1995).

Since every construction project is unique and has no standardized format, the interface problems are bound to occur(Gudienė et al., 2013).These turn into disagreements due to which the team members loose the spirit to perform resulting into compromised quality of work (Cheung and Suen, 2002).Another aspect of damage materializes into the time and cost overruns putting a strain on the business relationships among the parties which creates a state of dissatisfaction. (Ilter, 2012). Conflicts which turn into disputes escalate quickly and the matter may reach the court of law.

The conflicts and disputes are found to be increasing in construction industry (Nyarko, 2014; Yates and Hardcastle, 2003) escalating the direct and indirect project cost. The direct cost is the amount spent in dealing with lawyers, claim consultants and the costs associated with the delays of project. The indirect costs are the mistrust and poor work quality which deteriorate project success. Conflicts in construction industry has been ranked to be the highest factor behind the increase in project cost (Brockman, 2013). It has been reported that the amount spent in resolving disputes through litigation is US $5 billion annually in the Unites States(Ng et al., 2007). Therefore, efforts should be made by modifying the work practices to reduce the conflicts and disputes. For that their underlying causes should be identified so that their overall impact and rate of incidence can be decreased (Ilter, 2012) . As a general guideline coordination is required among the construction parties to ensure a seamless project execution (Mahamid, 2014).This can be achieved if parties recognize the duties being assigned to them in the construction contracts (Klimas, 2011).

Based on the critical review of published literature, this study takes an epistemological and pedagogical position by differentiating between the various outputs of disagreements and differences of opinion namely conflicts, claims and disputes. Not only a didactic view is presented but attempts are made to exhibit the evolution from disagreement to dispute. Further, the probable causes of disputes in

the construction industry are identified. The possible value-add of this study into the body of knowledge comprises of a better understanding of causes due to prime stakeholders which may practically imply an insight into occurrence of major issues during the project lifecycle.

2.2 CONFLICTS, CLAIMS AND DISPUTES

Disputes and conflicts are used synonymously by some authors in their research like Mitkus and Mitkus (2014). Likewise many other authors state that conflicts, claims and disputes are used interchangeably but their meanings are different (Al-Tabtabai and Thomas, 2004; Love et al., 2008).

Conflicts take place between two parties that compete over scarce resources, unharmonious goals and interfere with one another(Love et al., 2008).They also occur when the parties involved in the project reach a point where they become incompatible on the priorities and objectives. This creates an environment of frustration due to lack of cooperation among the parties(Acharya et al., 2006; Peansupap and Tachi, 2013).The unrealistic expectations, interpersonal relations, administrative procedure, tradeoffs between technical and performance issues are also a cause of conflicts (Li et al., 2012) and more specifically of those in the construction industry (Dada, 2013). Conflicts can be external or internal (Ng et al., 2007). Internal conflicts results due to issues among the project participants. External conflicts are due to political and weather risks, and other external agents. Similarly, the conflicts can either be functional or dysfunctional. Functional conflicts aide in progress of the project while dysfunctional ones hamper it (Gould, 1999). In construction industry it is impossible to achieve a conflict-free environment. Though completely eliminating them is not possible, efforts should be made to keep them under control (Younis et al.). Conflicts can be and should be managed so that they do not lead to disputes.

As per Acharya et al. (2006), unmanaged conflicts may result into claims. According to Semple et al. (1994). "*Claims are a request submitted by a party in order to recover the damages incurred*". The construction industry has been experiencing an unprecedented rise in claims (Zaneldin, 2006). These are the contractual tools to obtain benefits to which the aggrieved party considers himself

to be entitled (Bassioni et al., 2007).Claims are filed mainly due to the growing complexity of construction projects; the contractors are required to work on more risky undertakings in a sophisticated way under serious business competition. Owing to such challenging conditions, claims are inevitable (Ho and Liu, 2004). Delays in project, cost overruns, restricted cash flow and loss of liquidity to the contractors are usual repercussions due to claims (Bassioni et al., 2007). To increase the chance of acceptance, the aggrieved party must submit all the supporting documentary evidence (Zaneldin, 2006). After the claim is submitted, the owner and the contractor can come to a consensus and resolve it by issuing a change order or modification.

Claims settled by variations in the contract do not lead to any dispute (Kumaraswamy, 1997). In case such settlement is not done amicably, a dispute is created among the parties (Zaneldin, 2006; Kumaraswamy, 1997). Disputes are "*matters or controversies outside the scope of jobsite management that must be settled*" (Diekmann and Girard, 1995).They are regarded as disagreement by some authors while others argue that a dispute cannot take place until a claim has been put up by one party and the other party rejects it. The party initiating the claim tends to refuse the rejection of their claim, giving rise to a dispute (Kumaraswamy, 1997; Diekmann and Girard, 1995; Chynoweth et al., 2007). Difference of anticipated response against a particular claim between the two parties is at the core of disputes. It is a conflict that needs a resolution (Mustill, 1995). The parties in the construction projects watch out for their own interests. During the dispute resolution, if one party tends to compromise or show flexibility on the matter in hand, then the dispute has more chances of getting settled. The organizations should find the ways of resolving them as early as possible before they cause serious damage.

The conflicts should be managed at their earliest so that they do not result into claims and further into disputes. The disputes are often resolved by the involvement of the third parties in the process of litigation and arbitration(Fenn et al., 1997; Frey, 2002). A taxonomy of dispute resolution proposed by Fenn et al. (1997) states that conflict resolution is based only upon non-binding decisions but in case of disputes, both binding and non-binding options are available. Non-

binding resolution procedures to resolve disputes include conciliation, executive tribunal and mediation while dispute review boards, dispute review advisors, negotiations and quality matters are conflict management strategies. Binding methods to resolve disputes include negotiations, adjudication, arbitration, expert determination and litigation. According to Gould (1998), the non-binding dispute resolution procedures include negotiation, mediation, conciliation, executive tribunal/mini trial and expert determination. While the binding procedures include mediation-arbitration, adjudication and arbitration. However, the general guidelines enable the mutual agreement among the parties to determine the binding and non binding status of above mentioned strategies (Bristow and Vasilopoulos, 1995).

Disagreements are that risks that if not managed properly can turn into conflicts, claims and disputes (Kumaraswamy, 1997; Acharya et al., 2006; Mitkus and Mitkus, 2014).Hence, their root cause is same. When the matters remain unresolved, they ultimately reach the point where projects and stakeholders suffer tangible and intangible losses. Therefore, this study will aims at identifying the root causes of disputes for better understanding and resolution.

2.3 CAUSES OF DISPUTES – LITERATURE REVIEW

The primary objective of this study, i.e. identifying the factors leading to disputes in construction industry was achieved by reviewing the literature. The methodology was divided into two stages; in the first stage, a three-step content analysis as suggested by Yi and Wang (2013), Hong et al. (2011) and Osei-Kyei and Chan (2015) for collecting and analyzing the factors was performed. In the second stage, the identified factors were subjected to a two-step screening process based on their frequency of appearance in the published literature.

2.3.1 Stage 1

In the first step, the pertinent journals publishing high quality research in the field of construction and project management were identified. The journals targeted included “Journal of Construction Engineering and Management (JCEM)”, “International Journal of Project Management (IJPM)”, “Journal of Civil

Engineering and Management (J Civ Eng Manag)", "Construction Management and Economics (CME)" and "Engineering, Construction and Architectural Management (ECAM)".For this purpose, ASCE library, Science Direct and Taylor and Francis online were searched to find out the relevant articles. The journals JCEM, IJPM, CME and ECAM fall into the category of top six construction management journals (Osei-Kyei and Chan, 2015). Articles belonging to other journal were searched using Google Scholar.

The search phrase for finding the relevant articles include *"disputes in construction industry"*, *"conflicts in construction industry"* and *"claims in construction industry"*. The search was carried out to find the relevant information in the title, keywords and abstracts of the research papers. The abstracts were studied to identify the articles that contained the desired information. In JCEM a total of 530 articles were found out of which 10 were found to be related to the subject topic. Upon detailed study 6 research papers were found most relevant and used for further analysis.

In IJPM a total of 1425 articles were found. Based upon their abstract 6 articles were considered for further study in which only 2 papers were found to contain the required data. In J Civ Eng Manag 272 articles were found out of which no article made it into the relevant ones. Similarly, none of the 88 retrieved articles from CME were found to be relevant to the subject topic. In ECAM 165 results were found from which 8 were considered on the basis of abstract. However, only 3 among them were found relevant to the topic.

Afterwards search was conducted using "Google Scholar" to find out more papers on the subject topic. A total of 60 research papers from the entire retrieved were studied. Those having the required information include 2 articles from "Building Research and Information" "Procedia Social and Behavioral Sciences" and "International journal of construction management" each and only 1 article form "Journal of Performance and Constructed Facilities", "Construction Law Journal", "Journal of Professional Issues in Engineering Education and Practice", "IEEE Transactions on Engineering Management", "IOSR Journal of Mechanical and Civil Engineering", "Journal of Marine Science and Technology", "Journal of Financial Management of Property and Construction" and "Journal of King Saud

University - Engineering Sciences". A total of 8 conference papers were also studied. In total, 33 articles were selected from the literature search process and used for further analysis.

The papers were sorted out to determine the origin of their authors. One score point was given to a particular country if all the authors have the same origin. In case of multi-authored papers having contributors from different countries, the formula was given in Equation 2.1 determined by Howard et al. (1987) and used by Osei-Kyei and Chan (2015) is considered.

$$\frac{1.5^{\mathrm{n}-1}}{\sum_{i=1}^{n} 1.5^{\mathrm{n}-1}} \qquad \text{Equation (2.1)}$$

In Equation 2.1 "n" denotes the number of authors and "i" indicates the order of each author. For example, three authors from Pakistan contribute with an American author to write a research paper who is second in order. The scores given to the authors in the order of their position in the publication are 0.42, 0.28, 0.18 and 0.12. Thus, a total of 0.72 score was given to Pakistan while 0.28 to the USA. After assessing the contribution of various countries in the research, the factors were identified and shortlisted for further processing. The factors having at least two citations were considered which then pass through the Stage 2 screening process.

2.3.2 Stage 2

Step 1: The factors appearing in at least 25% of the total papers were considered for further study. For example, out of 33 papers on which this study is based upon, the factors appearing in at least 8 papers were considered for further analysis.

The factors are subjected to another screening process where their quantitative and qualitative significance was evaluated. For the quantitative evaluation, Equation 2.2 is used.

Quantitative marks = (No of citations/Total Citations) x 50 Equation(2.2)

The factors were also marked qualitatively and stated as High (H), Medium (M) and Low(L) significant. They were given 1, 0.75 and 0.25 score respectively as given in Equation 2.3.

Qualitative marks = Rating (H, M, L) x 50 Equation (2.3)

On the basis of sum of quantitative and qualitative marks, 5 most significant factors that could lead to disputes were identified.

2.4 ANALYSIS AND RESULTS

2.4.1 Classification of Research papers according to Countries

The studied literature has been contributed by authors from a total of 19 countries as shown in Table 2.1. Out of them, Hong Kong, Saudi Arabia, Pakistan, USA and India were among the top five countries contributing research in the field of conflicts and disputes in construction. From the top five cluster, 80% belong to Asia. Not only this but most of the articles were contributed by researchers belonging to Asia; 34 authors from 10 Asian countries have contributed 20 research papers. Further, 7 European authors belonging to three different countries have written 4 research papers. Also, a total of 4 research papers were written by six authors belonging to three different African countries. From North America, overall 7 authors have written 4 papers on this topic. From Oceania, 6 authors have written 2 research papers in this field. It can be concluded that most of the researchers considering disputes to be an immense problem for the construction industry belong to Asia mainly due to its large size and also possibly due to turbulent and conflicting construction industry environment.

Tab1e 2.1: Distribution of authors

Serial No	Country	No of Researcher	Papers	Score
1	Hong Kong	7	5	4
2	Saudi Arabia	4	4	4

Serial No	Country	No of Researcher	Papers	Score
3	Pakistan	5	3	3.72
4	USA	4	3	2.28
5	India	5	2	2
6	England	4	2	2
7	Australia	6	2	2
8	Egypt	3	2	2
9	Canada	3	1	1
10	United Arab Emirates	1	1	1
11	South Korea	3	1	1
12	Taiwan	3	1	1
13	Thailand	2	1	1
14	Lithuania	1	1	1
15	Turkey	2	1	1
16	Palestine	1	1	1
17	Zambia	2	1	1
18	Denmark	2	1	1
19	Ghana	1	1	1

2.4.2 Identification and Screening of Factors

After evaluating the regional impact on research, the root cause factors of disputes in construction industry are identified. A total of 52 factors appeared in literature that could become the cause of dispute. Based on the first level screening, 31 factors that had at least 2 citations are enlisted along with selected references as shown in Table 2.2.

Table 2.2: Factors from literature

S.No	Factor	No of Citations	References
1	Delays in payment	20	Acharya et al., 2006; Watts and Scrivener, 1993; Iyer et al., 2008; Mitropoulos and Howell, 2001
2	Change orders	19	Semple et al., 1994; Al-Hammad, 2000; Sinha and Wayal, 2007; Hassanein and El Nemr, 2008
3	Contractual anomalies	18	Musonda and Muya, 2010; Sinha and Wayal, 2007; Kumaraswamy, 1997
4	Quality of work	14	Colin et al., 1996; Choudhry et al., 2012; Brooker, 2002; Cakmak and Cakmak, 2014
5	Errors in drawings and specifications	14	Brockman, 2013; Mitropoulos and Howell 2001; Hassanein and El Nemr, 2008; Cakmak and Cakmak, 2014
6	Lack of communication	13	Kumaraswamy, 1997; Al-Hammad, 2000; Mahamid, 2014; Mitkus and Mitkus, 2014
7	Delays in work	12	Brooker, 2002; Iyer et al., 2008; Cakmak and Cakmak, 2014; Mahamid, 2014
8	Changed conditions	12	Acharya et al., 2006; Cheung and Yiu, 2006; Hassanein and El Nemr, 2008; Cheung and Pang, 2012
9	Delay in reply to queries	12	Kumaraswamy, 1997; Acharya et al., 2006;Peansupap and Tachi,

			2013; Huang et al., 2008
10	Changes in prices of materials and labors	09	Iyer et al., 2008; Love et al., 2008;Cheung and Pang, 2012
11	Acceleration/Suspension of work	09	Semple et al., 1994; Acharya et al., 2006; Cheung and Yiu, 2006; Cheung and Pang, 2012
12	Estimation errors	08	Acharya et al., 2006; Cheung and Yiu, 2006; Zaneldin, 2006; Assah-Kissiedu et al., 2010
13	Acts of God	07	Al-Hammad, 1993; Semple et al., 1994; Acharya et al., 2006
14	Restricted access to site	07	Al-Hammad, 1993; Semple et al., 1994; Acharya et al., 2006; Love et al., 2008
15	Improper Contractor/Subcontractor selection	07	Kumaraswamy, 1997; Bassioni et al., 2007; Enshassi et al., 2012; Farooqui et al., 2014
16	Technical competence of team	07	Al-Hammad, 2000; Acharya et al., 2006;Farooqui et al., 2014
17	Low bidding price	06	Zaneldin, 2006; Bassioni et al., 2007; Assah-Kissiedu et al., 2010; Farooqui et al., 2014
18	Negative attitude of parties	06	Acharya et al., 2006; Zaneldin, 2006; Farooqui et al., 2014
19	Lack of proper supervision	05	Al-Hammad, 2000; Farooqui et al., 2014
20	Health and safety issues	04	Al-Hammad, 1993; Acharya et al., 2006; Brockman, 2013
21	Insufficient drawing details	04	Al-Hammad, 2000;Huang et al., 2008; Cheung and Pang, 2012
22	Risk allocation	04	Chan and Suen, 2005;Acharya et

			al., 2006; Cakmak and Cakmak, 2014
23	Lack of familiarity with local laws	04	Al-Hammad, 2000; Huang et al., 2008
24	Unrealistic expectations	04	Cheung and Yiu, 2006;Cakmak and Cakmak, 2014
25	Extension of time	03	Chan and Suen, 2005; Cakmak and Cakmak, 2014
26	Exaggerated claims	02	Kumaraswamy, 1997; Farooqui et al., 2014
27	Adversarial relationship	02	Chan and Suen, 2005; Cakmak and Cakmak, 2014
28	Team lacking spirit	02	Chan and Suen, 2005; Cakmak and Cakmak, 2014
29	Owner provided material	02	Acharya et al., 2006; Bassioni et al., 2007
30	Extra works	02	Acharya et al., 2006; Cheung and Pang, 2012
31	Productivity of labors	02	Al-Hammad, 2000

Delays in payment is the most cited cause of dispute by researchers with 20 out of 31 citations. *Change orders* and *contractual disputes* are next on the list. The top 3 factors have close competition. Therefore, from the literature point of view these three factors contribute almost equally towards occurrence of a dispute.

2.4.3 Year wise distribution of factors

The factors are categorized on annual basis to determine the pattern in which they appear in the literature. It is found that majority of the reasons that could become a probable cause of dispute in future were initially identified by the researchers between 1993-2000 and so were the prominent factors with the most number of citations. Factors with serial number 1 to 20 in Table 2.2 have at least five citations. Their year wise analysis indicates that 17 factors were identified by

year 2000 and only 3 were identified later. After initial identification these factors have continued to appear in the literature. This points towards the crucial period for research focus on causes of dispute. The 3 factors identified later include *acceleration/suspension of work, low bidding price* and *negative attitude of parties*.Zaneldin (2006) mentioned all three remaining factors while (Acharya et al. (2006)) considered two amongst them to be the cause of dispute (excluding *low bid practice*). Since 2006 these 3 factors have been extensively sought to be the cause of dispute and have frequently appeared in the literature.

2.4.4 Sources of occurrence of disputes

The disputes mentioned above were found to occur between the three prime stakeholders a project: client, consultant and contractor. The source of dispute can be any of these parties while in some cases two or even all parties contribute towards creating a potential dispute. Based on the nature of sources of disputes, roles and responsibilities of prime stakeholders, and general understanding of construction business, the identified sources were allotted to the stakeholders.

It can be observed in Figure 2.1 that contractor is the potential source for most of the disputes. Some of the causes are overlapping like *delay in reply to queries* by any of the parties can lead to a dispute. Similarly, *negative attitudes* by any of the project participants can have harmful impacts on the project in the form of dispute. The disputes caused by the owner and the consultant may start during the design and bidding phases and continue during the construction. For example, *errors in drawings and specifications*, and *poor estimation practices* may cause a dispute between the owner and consultant during the design stage. Those caused by the contractor appear during the construction stage and extend to the defects liability period.

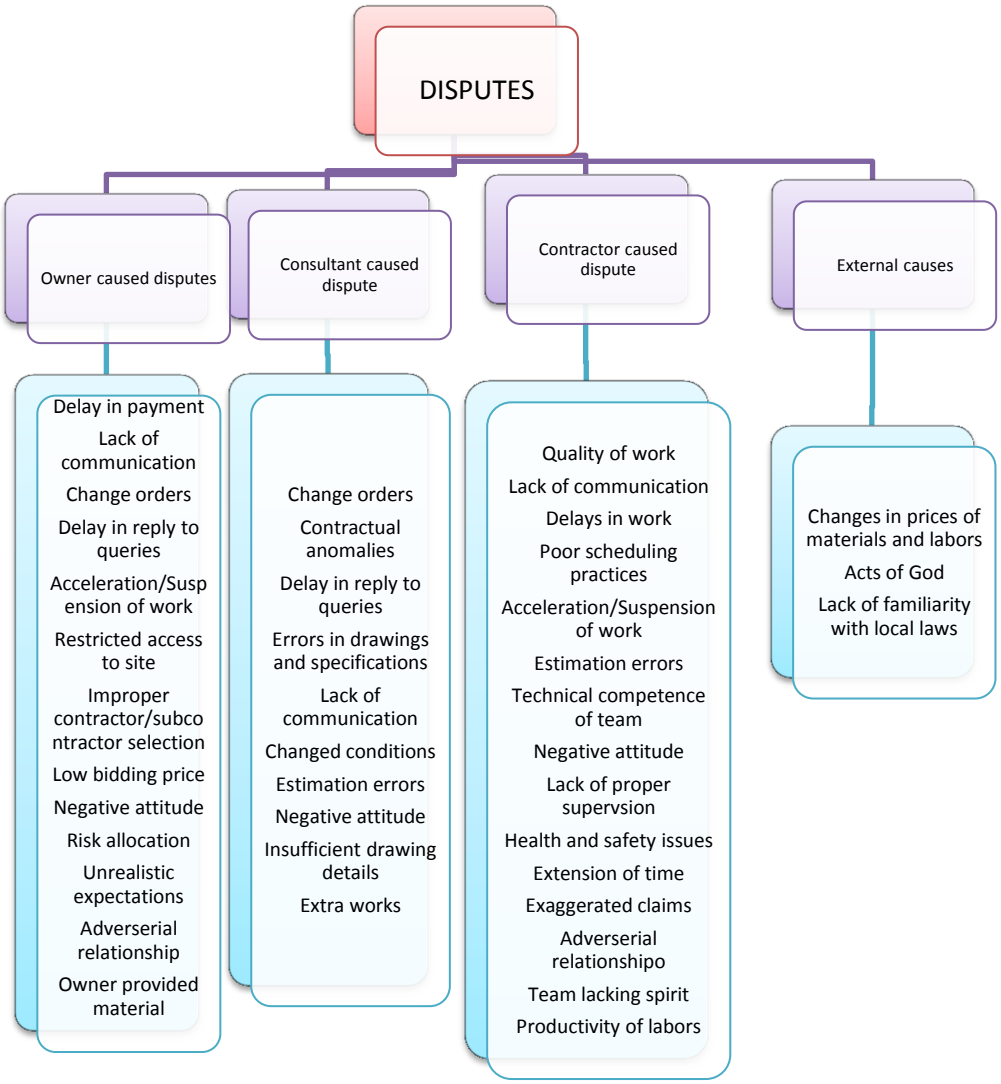

Figure 2.1: Sources of dispute occurrence

2.4.5 Top factors based on number of Citations

Based upon the minimum 25% citation criteria set for first level screening, a total of 12 factors (Serial number 1 to 12 in Table 2.2) with at least 8 citations each are carried forward for further analysis. Based upon quantitative and qualitative scores the top five causes of disputes are highlighted in Table 2.3.

Table 2.3: Qualitative+ Quantitative Analysis

S.No	Description	Quantitative Points	Qualitative Rating	Total Points (Quantitative +Qualitative)
1	Delays in payment	30.30	H	80.3
2	Change orders	28.78	H	78.78
3	Quality of work	21.21	H	71.21
4	Delays in work	18.18	H	68.18
5	Contractual anomalies	27.27	M	64.77
6	Errors in drawings and specifications	21.31	M	58.81
7	Lack of communication	19.69	M	57.19
8	Changed conditions	18.18	M	55.68
9	Changes in prices of materials and labors	13.63	M	51.13
10	Acceleration/Suspension of work	13.63	M	51.13
11	Delay in reply to queries	18.18	L	30.68
12	Estimation errors	12.12	L	24.62

2.5 RECOMMENDATIONS TO AVOID DISPUTES

- Owners and consultants should carry out detailed study during the design phase so that change orders and variations can be avoided at the later stage (Mahamid, 2014). While the design is being carried out, the client should sign the documents after each phase to acknowledge that their requirement is being met and a workable solution is expected to be achieved (Love et al., 2010). If change order occurs then there should be a proper mechanism to deal with it in order to compensate the contractor for direct and indirect

costs and any loss of productivity associated with it (Semple et al., 1994; Zaneldin, 2006)

- The progress payments should be paid to the contractor in time and the client should make arrangements so that no delay occurs in this process. The long bureaucratic process should be reduced so that payments could be made within the time allotted in the provisions of the contract (Assah-Kissiedu et al., 2010; Mahamid, 2014)
- An appropriate type of contract with balanced conditions for all parties should be used like FIDIC contracts. Special consideration should be given to the clauses regarding variations, disputes, approvals, payments etc.(Bassioni et al., 2007). Some consultants draft the contract documents by copy pasting those used for other projects. In this way, the contract does not address the particular project needs(ASAH-KISSIEDU, 2009). The unforeseen circumstances are not catered for and it results in enormous transfer risks to the contractor. Often such clauses are drafted that shift huge amount of risks directly to the contractor, for example the responsibility of differing site conditions lie with the contractor. Therefore, matter leads to litigation in case of some issues. Such practices should be avoided (Jannadia et al., 2000).
- Owner should give sufficient time to the consultant to prepare the drawings and specifications (Bassioni et al., 2007; Semple et al., 1994; Zaneldin, 2006). Experienced consultant should be employed. To avoid the errors, a third party should be employed to review the documents in case of complex projects. Design verification, reviews and audits should be conducted. Consultant should be paid adequate level of fees. Initially, a lump sum price should be given and extra works should paid on cost plus basis (Love et al., 2010).
- Project participants should enhance the communication during the project(Mahamid, 2014). Core issues like variations, payments design etc. should be communicated to the concerned parties. Records of communication should be kept for future reference (Assah-Kissiedu et al., 2010).

- A detailed site investigation should be carried out at the design stage (Mahamid, 2014). In this way, changed conditions could be avoided.

2.6 RESULTS OF LITERATURE REVIEW

Based on a didactic analysis of published literature, the epistemological evolution of disputes from disagreements in the construction projects was studied. An extensive content analysis was performed to investigate the research trends between years 1993 – 2015. A total of 2540 research papers published in various academic journals and conference proceedings were retrieved. Based on the abstract and quick overview, only 40 articles were found to be relevant. Another screening further reduced this number. The analysis presented in this study in based on 33 research articles which cleared all screening processes and contain the information relating to the factors causing disputes in construction projects.

While observing the origin of authors of selected papers, it was determined that more studies have been contributed by the authors from Asia in this domain indicating the dynamism, chaos and uncertainty presence in the construction industry of this region.

A total of 52 factors were found in the literature out which 31 were considered for the further analysis. The factor were classified with respect to their source of origin i.e. owner, consultant and contractor. For most of the factors contractor was found to be the source of occurrence. The factors were subjected to a screening process. As a result of which top 5 factors that could become a potential cause of dispute were identified. Except few, the factors with more number of citations were also ranked to be significant in the literature. The impact of these factors was found to be considerable as compared to those having lower number of citations.

This analysis culminates into identification of most important root causes of disputes in construction projects: *delays in payment, change orders, quality of work, delays in work and contractual anomalies.*. Delayed payment is the highest ranked cause of dispute that requires attention of owner. The progress payments of the contractor should be expedited. Consultant is required to put in more effort

during the design and planning stages to avoid the disputes that originate due to them.

On the whole the root causes of dispute dictate that wisdom, carefulness and modern project management techniques should be employed in order to overcome them in the first place. These bases of disputes should be addressed before they turn into something huge and the matter goes into litigation or arbitration. Successful dispute resolution relies on effective conflict management which in turn is based on effective communication. An effective communication system will ensure that disagreements are addressed meritoriously and they do not escalate into conflicts. However, if such a situation arises, a well-thought-out conflict management system will not allow the situation to turn into disputes. Thus, the conflicts will be successfully looked after. Nevertheless, circumstances may result conflicts to further escalate into disputes. In such scenario, a balance dispute resolution system may not only ensure solution of the matter but also pave way towards harmony between the stakeholders and project success as a result.

2.7 GENERAL CONDITIONS OF SUBCONTRACTS

The international conditions of subcontract studied during the literature review part were compared. The conditions of subcontract studied and considered during the study included “Associated General Contractors of California Long Form Standard Subcontract”, FIDIC Conditions of Subcontract for Works of Civil Engineering Construction, 1994”, “The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011”, “Conditions of Subcontract by Construction Industry Development Board (CIDB) Malaysia”, “American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor” and “The Government of Hong Kong special administration region subcontract for building works 2000 edition” as shown in Table 2.4.

Table 2.4: Comparison of international subcontracts

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Sufficiency of tender	No such provision	No such provision	No such provision
Entering into subcontract	No such provision	Within twenty eight days after receiving letter of acceptance from contractor	No such provision
Representative on site	No such provision	Contractor and subcontractor should depute their representatives	Contract administrator with the power to make decisions on quality, time, payments etc should be nominated by the contractor
Execution of work	Within fourteen days after contractor's notification	No such provision	No such provision
Satisfaction of works	No such provision	No such provision	No such provision
Errors in design	Immediately inform the contractor	Immediately inform the contractor	No such provision
Extensions of time	Given in case of events for which subcontractor is not responsible	Given in case of events for which subcontractor is not responsible	No such provision
Position of Main contract	No such provision	No such provision	No such provision
Access to main contract	No such provision	Give access to subcontractor except its price part	No such provision
Indemnification	Parties should indemnify each other in cases where the other party is not responsible	Parties should indemnify each other in cases where the other party is not responsible	Parties should indemnify each other in cases where the other party is not responsible

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Instructions to subcontractor	Can only be given by main contractor	If Engineer gives an instruction send its copy to the contractor. Contractor's instructions should be followed	Subcontractor should abide with Contractor administrator's instructions
Access to site	Should be given to the subcontractor by the contractor	Should be given to the subcontractor by the contractor	No such provision
Claims by contractor	No such provision	Contractor should submit claim to the subcontractor and make a fair decision if an agreement is not reached	No such provision
Subcontractors responsibilities	Execute the works assigned to them by their workforce	Execute the works assigned to them by their workforce	Execute the works assigned to them by their workforce
Design of works by subcontractor	No such provision	Take responsibility of the works designed by them to the extent of the subcontract	No such provision
Health and safety	No such provision	Subcontractor's responsibility	Both contractor and subcontractor's responsibility
Submission of waste management plan	No such provision	No such provision	No such provision
Access to site by the subcontractor	Employer, Engineer and Main contractor should be given the access to the site	Employer, Engineer and Main contractor should be given the access to the site	No such provision

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Performance security	Should be provided to the contractor within twenty-eight days of letter of acceptance. Payments will be withheld until such security is not furnished	Should be provided to the contractor within twenty-eight days of letter of acceptance. Payments will be withheld until such security is not furnished	No such provision
Sub Sub contracting	Not without the consent of main contractor	Not without the consent of main contractor	No such provision
Notice prior to beginning of work	No such provision	Fourteen days prior to commencement of each work	No such provision
Notices to contractor	Notices regarding delays and other issues should be given to the contractor	Within twenty one days after the contractor becomes aware of issues like extension of time, additional costs, etc.	No such provision
Schedule of activities	Subcontractor should submit schedule of activities within fourteen days of letter of acceptance	Subcontractor should submit schedule of activities within fourteen days after receiving letter of acceptance	Contractor submits a detailed work schedule to the subcontractor. Subcontractor submits a schedule to contract administrator
Progress reports	No such provision	Subcontractor should submit them	No such provision
Suspension of work by contractor	No such provision	Reasons for suspension should be provided to the subcontractor	No such provision

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Notice of completion of works	No such provision	Should be submitted by the subcontractor but not before seven days prior to completion of works	Should be submitted by the subcontractor seven days prior to completion of work
Response to subcontractor's notice	No such provision	Response to notice of completion should be within twenty one days by the contractor	No such provision
Performance certificate	No such provision	Contractor should forward it as soon as they receive it from the employer	No such provision
Subcontractor's involvement in measurement of works by Engineer and Contractor	No such provision	Should be given right to be involved	No such provision
Contractor's right to make fair decision	No such provision	In case of non-agreement on the measurement of works, contractor is given the right to make a fair decision	No such provision
Variations	Should only be acted upon if given by main contractor	Should only be acted upon if given by main contractor	No such provision
Acceleration of work	No such provision	Contractor can give instructions to accelerate the work	Contractor can give instructions to accelerate the work
Statement for payment	Subcontractor should submit within seven days after end of each month	Subcontractor should submit it at least seven days before the date the contractor has to submit it to the engineer	No such provision

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Payment details	No such provision	Details about interim payment certificates should be provided to the subcontractor	No such provision
Notice in case of delay of payments	Explanation of the details in case of delay should be given to the subcontractor	No such provision	No such provision
Withholding payments	No such provision	No such provision	No such provision
Payment to subcontractor	Within seventy days after payment statement is submitted	Within seventy days after payment statement is submitted	Should be stated in contract, else it should be made within thirty days from issue of payment certificates
Retention money	At least half should be paid within thirty-five days of handing taking over. Rest should be paid within seven days of release of final payment	At least half should be paid within twenty-eight days of handing taking over. Rest should be paid within seven days of release of final payment	At least half should be paid within seven days of practical certificate. Rest should be paid when final accounts are clear
Final payment	Within eighty four days of submission of final payment certificate	Within fifty-six days of defects notification period. Else contractor will pay financing charges.	No such provision
Completion certificate	No such provision	No such provision	Should be provided to the subcontractor
Termination of main contract	Subcontract will be terminated	Subcontract will be terminated	No such provision
Return of performance security	Twenty eight days after defects liability certificate is issued	Within seven days after receipt of security from the employer	No such provision

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Termination of contract due to main contractor	Subcontractor shall be paid for the works executed	Subcontractor shall be paid for the works executed	Subcontractor shall be paid for the works executed
Termination of subcontract by the contractor due to subcontractor's default	No such provision	Notice should be given to the subcontractor fourteen days before termination	In case subcontractor does not resolve issue within fourteen days of notice by the contract administrator the contractor can terminate the subcontract
Suspension by subcontractor	No such provision	In case of non-payments subcontractor can suspend the work by given a notice twenty one days prior to it	Subcontractor gives notice to contractor in case of non-payments and contractor does not resolve the problem than subcontractor can terminate or suspend work after twenty one days
Termination of contract by subcontractor	No such provision	By given a written notice fourteen days prior to intended date of termination	Subcontractor gives notice to contractor in case of non-payments and contractor does not resolve the problem than subcontractor can terminate or suspend work after twenty one days

Description	FIDIC Conditions of Subcontract 1994	FIDIC Conditions of Subcontract 2011	CIDB Malaysia
Site before handing over	Responsibility lies with subcontractor	Responsibility lies with subcontractor	No such provision
After taking over of site	Subcontractor's responsibility during defects liability period	Subcontractor's responsibility during defects liability period	No such provision
Insurance	Contractor and subcontractor should carry out insurance to cover expenses associated with the project	Contractor and subcontractor should carry out insurance to cover expenses associated with the project	Contractor and subcontractor should carry out insurance to cover expenses associated with the project
Collateral warranty	No such provision	No such provision	Subcontractor should submit a collateral warranty that makes it responsible it to the Client in the same
Dispute handling	Notice should be served to the other party	Notice should be served to the other party	Parties are encouraged to negotiate or take help of a mediator
Dispute resolution	No amicable settlement within fifty five days of notice than method should be passed on to arbitration process.	Subcontract DAB will be formed consisting of one qualified person mutually agreed by with in forty-two days of notice of dispute. Decision of DAB will be binding on both parties unless one party serves a notice of dissatisfaction. The parties should try to reach an amicable settlement on that, else the matter is directed to arbitration.	Parties should go for adjudication in case the issue remains unresolved. Adjudicator is given thirty days to make a decision. The decision of adjudicator will be a binding on both parties but it can be reviewed by arbitrators and courts. If issue still remains unresolved it can be directed to arbitration. Arbitrator's decision will be binding on both parties

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Sufficiency of tender	No such provision	Subcontractor is assumed to be fully satisfied with the tender documents	No such provision
Entering into subcontract	No such provision	When called upon by general contractor	No such provision
Representative on site	No such provision	No such provision	Subcontractor should nominate a representative on site
Execution of work	No such provision	No such provision	No such provision
Satisfaction of works	No such provision	Works shall satisfy both contractor and architect	No such provision
Errors in design	No such provision	No such provision	No such provision
Extensions of time	Can be given with the consent of the contractor		No such provision
Position of Main contract	No such provision	In case of conflict provision of main contract will prevail	No such provision
Access to main contract	No such provision	Give access to subcontractor except its price part	No such provision
Indemnification	Parties should indemnify each other in cases where the other party is not responsible	Parties should indemnify each other in cases where the other party is not responsible	Parties should indemnify each other in cases where the other party is not responsible
Instructions to subcontractor	No direct instructions to subcontractor employees allowed to the contractor	Can only be given by main contractor	No such provision

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Access to site	No such provision	No such provision	No such provision
Claims by contractor	No such provision	No such provision	No such provision
Subcontractors responsibilities	Execute the works assigned to them by their workforce	Execute the works assigned to them by their workforce	Execute the works assigned to them by their workforce
Design of works by subcontractor	No such provision	No such provision	No such provision
Health and safety	Subcontractor's responsibility	No such provision	Subcontractor's responsibility
Submission of waste management plan	Subcontractor's responsibility	No such provision	No such provision
Access to site by the subcontractor	No such provision	Employer, Engineer and Main contractor should be given the access to the site	Employer, Engineer and Main contractor should be given the access to the site
Performance security	No such provision	No need to provide any security by the subcontractor	Performance, material and labor bonds should be provided to the main contractor
Sub Sub contracting	Not without the consent of main contractor	Not without the consent of main contractor and architect. The decision of architect shall prevail	No such provision
Notice prior to beginning of work	No such provision	No such provision	No such provision

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Notices to contractor	No such provision	Notice should be submitted within twenty one days of an event	Notices regarding delays and other issues should be given to the contractor within forty eight hours of the event
Schedule of activities	Contractor submits a detailed work schedule to the subcontractor	Contractor submits a detailed work schedule to the subcontractor	Subcontractor should submit schedule of activities
Progress reports	Subcontractor should submit them	No such provision	No such provision
Suspension of work by contractor	No such provision	No such provision	No such provision
Notice of completion of works	No such provision	No such provision	No such provision
Response to subcontractor's notice	No such provision	No such provision	No such provision
Performance certificate	No such provision	No such provision	No such provision
Subcontractor's involvement in measurement of works by Engineer and Contractor	No such provision	No such provision	No such provision
Contractor's right to make fair decision	No such provision	No such provision	No such provision
Variations	Upon instructions by contractor course of action should be modified by the contractor	Order should be in writing by the architect and confirmed by the main contractor	No such provision

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Acceleration of work	No such provision	No such provision	No such provision
Statement for payment	No such provision	No such provision	No such provision
Payment details	Details about interim payment certificates should be provided to the subcontractor	No such provision	No such provision
Notice in case of delay of payments	No such provision	No such provision	No such provision
Withholding payments	No such provision	No such provision	In case work is defective, insurance, warranty etc is nor provided, the works are delayed by the subcontractor
Payment to subcontractor	Within seven days after receiving payments from the owner, else subcontractor should be provided the interest on the payment	Within seven days after receiving payments from the owner, else subcontractor should be provided the interest on the payment	Within seven days after receiving payments from the owner, else subcontractor should be provided the interest on the payment
Retention money	No such provision	No such provision	Should be paid upon completion of project
Final payment	Within seven days of payment from the owner	No such provision	No such provision
Completion certificate	No such provision	No such provision	No such provision
Termination of main contract	Subcontractor can be assigned to the owner	Subcontract will be terminated	No such provision
Return of performance security	No such provision	No such provision	No such provision

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Termination of contract due to main contractor	No such provision	Subcontractor shall be paid for the works executed	No such provision
Termination of subcontract by the contractor due to subcontractor's default	If subcontractor does not resolve the issue mentioned in the notice for correction the contractor can terminate the contract	If subcontractor does not resolve the issue mentioned in the notice for correction with in seven days the contractor can determine the status of employment of subcontractor in the next notice	Notice should be given to the subcontractor. If issue is not resolved within ten days contract can hire its own force and reimburse the costs from the subcontractor
Suspension by subcontractor	Subcontractor can suspend the work if the payment is not made within seven days of agreed date	No such provision	No such provision
Termination of contract by subcontractor	Subcontractor upon nonpayment from the contractor within sixty days of due date of payment can terminate the contract	No such provision	No such provision
Site before handing over	No such provision	Responsibility lies with subcontractor	Responsibility lies with subcontractor
After taking over of site	No such provision	Subcontractor's responsibility during defects liability period	No such provision
Insurance	Subcontractor is required to carry out insurance works that should cover the time till the expiry of defects liability period	No such provision	Subcontractor is required to carry out insurance works that should cover atleast four years following the completion of project

Description	American Institute of Architect	Hong Kong Subcontract	AGC
Dispute handling	Parties are encouraged to have mediators for the resolution of issues	No such provision	No such provision
Dispute resolution	If issues are not resolved, then parties can move ahead with arbitration. The decision of arbitrator will be binding upon the parties but can be challenged in the courts	Matters should be directed to the architect. The architect should make a binding decision within twenty days. If matter is not resolved than it should be directed to mediation and arbitration.	Parties should carry out negotiations which if not successful than try involving a neutral third party. Matter can be directed to arbitration of desired by the parties.

CHAPTER 3

METHODOLOGY

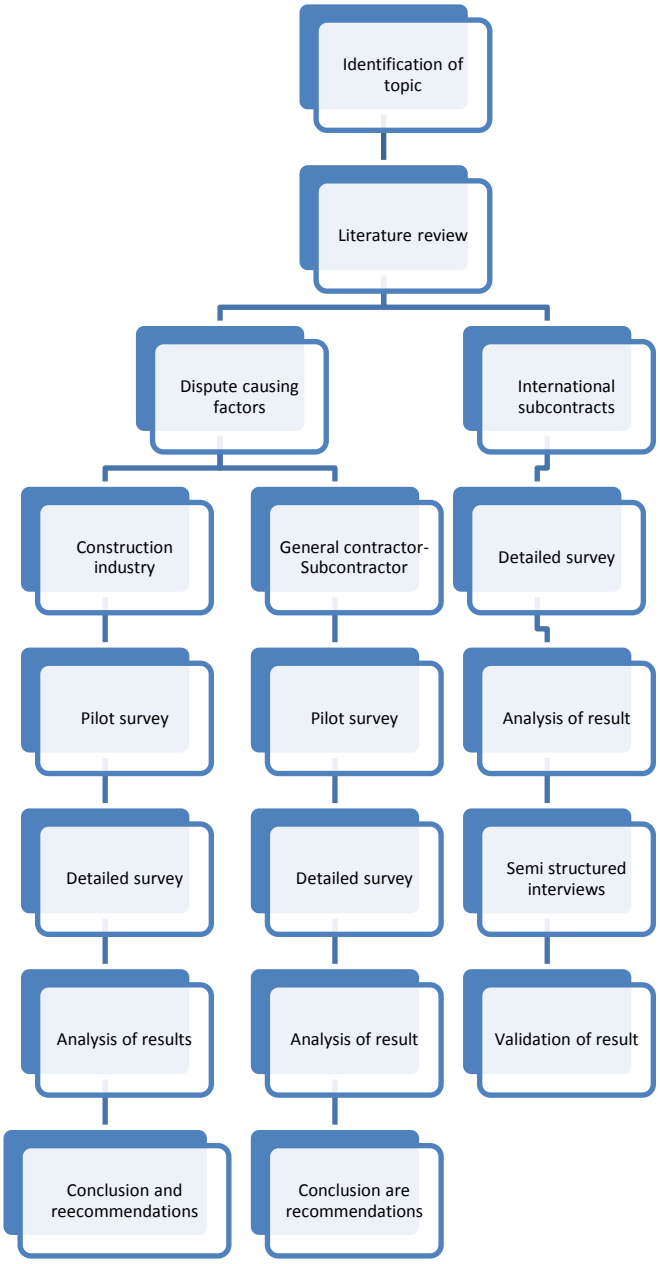

Figure 3.1: Methodology

3.1 INTRODUCTION

This chapter explains the methodology adopted for the research. A brief rundown of the methodology for the complete research is given at the beginning of

this chapter. It provides an insight to the population targeted for the research, the adequate sample size and various techniques used to collect data. The statistical tests used to analyze the data are also briefly explained in this chapter.

3.2 RESEARCH STRATEGY

The research is focused on achieving three main objectives. The disputes in the construction industry and those between the contractor and the subcontractor are to be identified and ranked and a review of various international subcontracts has to be done to prepare recommendations regarding contract provisions that the professionals of the construction industry of Pakistan consider most suitable for the General conditions of Subcontract in Pakistan. The disputes identified can be addressed in a better way through these conditions of subcontract. The research consist of two disparate sets of information i.e. the causes of disputes between the general contractor and the subcontractor and the international subcontracts. This data of distinct information will be merged at the final stages of the research.

As indicated by Figure 3.1 the research began with the literature review step which was carried out to identify the causes of disputes in the construction industry. Side by side, the provisions of various international subcontracts were also studied in this step. Data from journals, books, conference papers, etc. were retrieved to list down the factors that can be carried forward in the survey. First of all a survey was conducted in the local market to determine the gap in the literature and practical industry regarding the "Causes of disputes in the construction industry". The first survey targeted the impact and probability of dispute causing factors in order to determine the top causes of disputes. In this way the dispute causing factors identified after a three step content analysis approach were compared with the survey conducted in the local market. The next step focused the general contractor and subcontractor relationship. The factors of disputes determined after the literature review formed the basis of a preliminary questionnaire which was later developed into a detailed one. Not only those factors that purely occur between the contractor and subcontractor were considered but those originating from the client and architect/engineer sources also constituted an

integral part of the study. The effect of these factors could also be passed on to the general contractor and subcontractor's relationship, hence these were considered too. The factors were first subjected to a pilot survey. The factors identified after the literature review were discussed with the experts of the construction industry so that the most eminent causes of disputes between the general contractor and the subcontractor could be carried forward for the further study. Face to face discussions were carried out with the construction professionals to determine the factors most suitable to be a part of final survey. The factors shortlisted after the pilot survey were then subjected to a detailed survey. The survey targeted two main aspects of these disputes causing factors i.e. their probability of occurrence and the impact they pose to the general contractor and subcontractor's relationship. The technique used to obtain the responses was "Likert scale". It is a technique used in questionnaire surveys to determine the level of agreement the respondents have with a set of statements. The respondents indicate their level of agreement using an ordinal scale (Bertram, 2007) . A five point Likert scale was used in the survey. The respondents were asked to rate the probability and impact of the factors from 0 to 5 where 0 indicate no impact and no chance of occurrence while 5 depicts very high impact and very high chance of occurrence.

The survey targeted both local and international construction industries. The purpose was to achieve a global picture of the causes of disputes between two very important stakeholders of the construction projects i.e. the general contractors and the subcontractors. The analysis of the results obtained was carried out on "SPSS" software. The significant statistical characteristics of the data were determined. Based upon the results of various statistical techniques employed the analysis was carried out to rank the causes of disputes. The aim was to determine the risk posed by the dispute causing factors. A comparison was carried out between the results indicated by various groups of respondents. To cater for the disputes determined from the above mentioned research process a framework that could help resolving these disputes is required to be established. Whenever any matter or dispute occurs the parties refer to the contract between them to determine the position they hold in that particular case. Contract plays a central position in determining the resolution of disputes. It also contains the provisions regarding the

resolution of disputes when parties are unable to make any decision. If the provisions are balanced than disputes will be minimized too (Jannadia et al., 2000).

The provisions of subcontract developed internationally by eminent organizations studied in the literature review part were compared. These clauses not only provided the guidelines to address the day to day relationship among the parties but also the dispute resolution procedures were discussed. The clauses in which the contracts differed or some remained silent while others addressed them will be developed into a survey. This survey was helpful in determining the recommendations for development of framework between the two parties. The survey with multiple choice questions to the respondents who were asked to determine the provision which they considered to be the best solution for the contractor and subcontractor relationship in Pakistan. This survey targeted the professionals from the local industry only. The clauses which were selected by the respondents the most were further analyzed. In order to validate the results from the survey and to achieve the balance in the recommendations made by the professionals of the construction industry, semi structured interviews were carried out with the legal experts. The legal viability and balance in the provisions was sought through these interviews. Based upon which final recommendations were made. These recommendations not only targeted the disputes among the parties but also suggested a framework of subcontracting practices in Pakistan.

3.2.1 Sample Selection

Unless a census is conducted it is not possible to carry out a survey that covers each and every member of the population. Therefore a sample is drawn out of the population. The attempt of the researcher is to ensure that the sample should be representative of the population (Banerjee and Chaudhury, 2010). First survey was to be conducted in the local market only. Second survey was to be conducted internationally as well as in the Pakistani construction industry. The population size therefore becomes unknown in the case of global survey. A simple random sampling is to be done the surveys. In case of local, however the population size is known. The number of construction establishments registered with Pakistan Engineering Council (PEC) since 2013 is above 30,000. All of them do not work

on construction projects and are distributed among significant stakeholder organizations of the projects i.e. client, consultant and contractor. It was aimed that the professionals targeted for both local and international survey were having sufficient experience to answer the questions asked in the survey.

3.2.2 Sample size

The sample size depends upon the population size, sampling error and confidence level. The formula used to determine the appropriate sample size for simple random sampling in case of unknown population as indicated by Osborn (2006) is as follows (Eq 3.1)

$$\frac{z^2 * p * (1-p)}{c^2} \qquad \text{Equation (3.1)}$$

where

z= z value (1.96 for 95% confidence interval)

p= percentage picking a choice (0.5 in this case since respondent can either reply or ignore the survey)

c= Acceptable sampling error

Putting z=1.96, p=0.5 and c=0.10 in Equation (3.1) the sample size comes out to be 96. Keeping in view the constraints of getting international responses via emails the sampling error is kept to be 10%. Therefore any sample size greater than 96 can be assumed to reasonable for the studies. To determine the population size in case of local survey, the strategy proposed by Dillman (2000) has been used. At 95% confidence interval and 10% margin error the sample size comes out to be 96. The benchmark of sample size for both local and international survey is “96”.

3.3 FIRST SURVEY

The first survey was carried out in the local industry to determine the gap in the factors identified through three step content analysis approach and those existing in the construction industry. The factors identified through literature review were carried forward to the survey in order to rank them. First of all a pilot

survey was conducted to short list the factors for the detailed survey. According to Hill (1998) the sample size recommended for the pilot survey is between 10 to 30. The factors for which 60% respondents agreed that it can be a critical cause of dispute in the construction industry was carried forward for further research. A questionnaire was developed on Google forms (Annexure A) for detailed survey. It was sent to the professionals of the local construction industry. The respondents were asked to rate the probability and impact of these dispute causing factors on Likert scale from 0 to 5 where 0 means no impact and no chance of occurrence while 5 shows a very high impact and a very high chance of occurrence. The organization targeted during the survey included

- Habib Rafiq Pvt Limited (HRL)
- Defence Housing Authority (Lahore, Karachi, Islamabad)
- Bahria Town (Lahore, Karachi, Islamabad)
- Frontier Works Organization (FWO)
- National Logistic Cell (NLC)
- DHA Valley
- Capital Development Authority (CDA)
- Lahore Development Authority (LDA)
- Pakistan Public Works Department (PWD)
- Allied Engineering and Services
- Railcop contractors
- Fatima Jinnah Women University, Rawalpindi
- ESS ESS Consultants
- National Engineering Services Pakistan (NESPAK)

The probability and impact of the dispute causing factors were multiplied and the data obtained was checked for reliability in SPSS. It was determined using "Croanbach's Alpha method". Developed by Lee Croanbach in 1951, this method is used to check the internal reliability of the data and its consistency (Santos, 1999). It is a number between 0 and 1. It checks the internal connection of the items in the test (Tavakol and Dennick, 2011). The acceptable range for the reliability has been reported between 0.7 and 0.95 (Cappelleri et al., 2013). Also

for Likert scale data the value of reliability above 0.8 is considered to be the optimum goal (Gliem and Gliem, 2003).

Afterwards the factors were ranked using Relative importance index (RII). RII of the factors was determined in MS Excel using the formula given in Equation (3.2) used by Agrawal (2011) and Muhwezi et al. (2014)

$$RII = \sum W/A * N \ (0 \leq RII \leq 1) \qquad \text{Equation (3.2)}$$

Where: W – is the weight given to each factor by the respondents and ranges from 1 to 5

A – is the highest weight (i.e. 5 in this case)

N – is the total number of respondents.

3.4 SECOND SURVEY

In case of second survey the factors of disputes in the construction industry identified through the literature review were first subjected to a pilot survey. These factors indicated the causes of disputes in the construction industry and few were very specific to general contractor and subcontractor relationship. A questionnaire was developed to determine that whether they could become a probable reason of dispute between the general contractor and the subcontractor. The respondents were asked to respond “Yes” if it could be a probable cause of dispute between the two parties and reply “No” if they do not occur among them.All responses were obtained through face to face discussions with the professionals. This led to an increase in depth of knowledge and an improvement of the survey. An insight to the reason behind the occurrence of various factors was also understood.

The factors of disputes identified through literature review that passed through the pilot survey were subjected to a detailed survey. For that purpose a questionnaire was developed. The aim of the survey was to determine the “probability of occurrence of the factors” and their “impact” on occurrence. The questionnaire comprised of two sections (Annexure B). In the first section the respondents were asked about their personal details

In addition to that the respondents were asked to indicate the percentage of subcontracting taking place these days in their respective country between 0 to 100%. Second section of the survey dealt with dispute factors. The respondents

were asked to rate the probability and impact causing factors on Likert scale between 0 and 5. An online survey was created on Google forms. The next aim was to obtain responses from international and local professionals.

3.4.1 International Survey

The Google Form was posted on various Facebook Civil Engineering Groups that had international audience. The link to the online survey was posted in more than hundred groups. The group members were requested to respond to the survey questions based upon their experience and the conditions of construction industry prevalent in their country. Many groups that had the objective of dealing with construction claims and disputes were targeted. The construction professionals having vast experience in the construction industry were contacted via LinkedIn. Moreover many legal experts dealing with construction claims and litigations were requested to respond to the survey. On LinkedIn various groups that were dealing with Construction claims and disputes were approached. The group members were requested to provide their valuable feedback. High profile construction companies all over the world were searched with the help of Google and the link to the Google form was sent to them via email. Moreover various international companies were also contacted telephonically to obtain responses to the survey. An extensive campaign was carried out as well for online distribution of the form all over the world to get maximum responses.

3.4.2 Local Survey

To obtain the responses from local construction industry not only the link to the online survey form was sent to the professionals working in various organization via emails, Facebook and LinkedIn, but the hard copies of the survey were also distributed. The organizations targeted for the survey included

- Habib Rafiq Pvt Limited
- Defence Housing Authority (Lahore, Karachi, Islamabad)
- Bahria Town (Lahore, Karachi, Islamabad)
- Frontier Works Organization (FWO)
- National Logistic Cell (NLC)
- DHA Valley

- Capital Development Authority (CDA)
- Lahore Development Authority (LDA)
- Pakistan Public Works Department (PWD)
- Allied Engineering and Services
- Fatima Jinnah Women University, Rawalpindi
- National Engineering Services Pakistan (NESPAK)

In addition to the above mentioned organizations various other contractors and subcontractors working on a small scale were given hard copies of questionnaire by visiting the construction sites in Rawalpindi/Islamabad. Face to face discussions were also carried out with various contractors and subcontractors. This provided an insight to the construction practices and the causes of disputes between the general contractor and subcontractor.

3.4.3 Analysis of Results

After collecting the international and local responses the analysis was carried out in SPSS software. Various statistical techniques were employed. The reliability of data was determined in SPSS using Cronbach's alpha method

The responses were divided into three strips based upon their geographical positions. A comparison of the ranking of factors in the strips was carried out. RII of these factors were determined in the strips which formed the basis of their comparison.

At the end spearman's rank correlation has been determined between the strips using SPSS. If the significance value (p values) is less than 0.05 the data correlation is significant. The value of correlation lies between -1 and +1. If its value is above 0 it indicates a positive correlation. The value between below 0.3 shows a poor correlation, that between 0.3 and 0.5 indicates a fair correlation, 0.6 to 0.8 represents a moderately strong correlation while that over 0.8 shows a very strong correlation (Chan, 2003).

3.5 THIRD SURVEY

After finalizing the results of second survey the questionnaire for the third survey was finalized (Annexure C). The international conditions of subcontract studied during the literature review part were compared. The conditions of subcontract studied and considered during the study include "Associated General Contractors of California long form standard subcontract", FIDIC conditions of subcontract for works of civil engineering construction, 1994", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", "Conditions of Subcontract by Construction Industry Development Board Malaysia", "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" and "The Government of Hong Kong special administration region subcontract for building works 2000 edition". The clauses of these conditions of subcontract were developed into a questionnaire with special emphasis on those provisions in which they differed. Also there were certain provisions which were present in one contract and not considered in others. Many conditions were found similar in all contracts. It was deemed necessary to determine that whether these clauses developed by international agencies fit into the conditions of the construction industry or not. To achieve this goal a survey to determine their applicability was formulated.

3.5.1 Questionnaire for the third survey

The third questionnaire consisted of two sections (Annexure C). The first section asked the respondents about their personal details.

In the second section multiple choice questions consisting of clauses from the above mentioned subcontracts were stated. The respondents were asked to select the clause they consider best suited to the conditions of construction industry of Pakistan and it should be such that it remains balanced for both parties. The questions covered all the major provisions of the subcontracts studied in the literature review.

3.5.2 Conduction of third survey

The same methodology was followed in the third survey which was adopted while collecting local responses during the first survey. Same companies were targeted again as in the first survey. The online Google form was sent to the professional of construction industry. The hard copies of the questionnaire were also be distributed on construction sites of

- Defence Housing Authority (DHA) Phase II extension Islamabad
- DHA Valley
- Frontier Works Organization (FWO)
- Sultan Engineering and Constructions
- Gondal Constructions
- National Logistics Cell (NLC)
- Bahria Town Phase 8, Rawalpindi
- Allied Engineering
- Lahore Development Authority (LDA)
- Capital Development Authority (CDA)
- Habib Rafiq Pvt Ltd
- Planning and Development Directorate Fatima Jinnah Women University, Rawalpindi

In addition to the above mentioned organizations hard copies were also distributed to the various construction sites at Lahore and Islamabad and many private consultancies at Peshawar.

3.5.3 Analysis of third survey

Second survey was based on multiple choice questions on the contract provisions selected by majority of the respondents for ascertaining the suitability in relation to the prevailing condition of construction industry of Pakistan.

3.5.4 Semi Structured interviews

The provisions selected by the respondents in the survey were formulated into a contract draft. In order to secure a balance in the provisions of contract and to ensure that the recommendations for the development of subcontract are suitable for Pakistan, semi structured interviews were also conducted with the legal experts as a validation of the previous step of the research. Any suggestions given by the experts were incorporated in the recommendations for the development of subcontract.

CHAPTER 4

ANALYSIS AND RESULTS

4.1 FIRST SURVEY

The factors of disputes identified in literature review were subjected to a survey in the local market. The aim was to determine the position of these disputes in the local market and compare it with the results of published literature.

4.1.1 Pilot Survey

A pilot survey was conducted with 10 professionals to shortlist the factors for the detailed survey. A total of 18 factors shortlisted through these discussions were carried forward to the detailed research.

4.1.1 Profile of the respondents

The educational profile of the respondents is shown in Figure 4.1

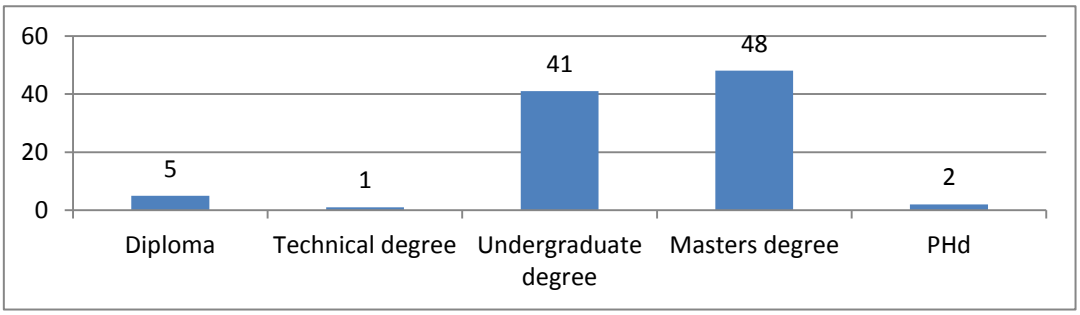

Figure 4.1: Educational profile of respondents

The organizational profile of the respondents is shown in Figure 4.2

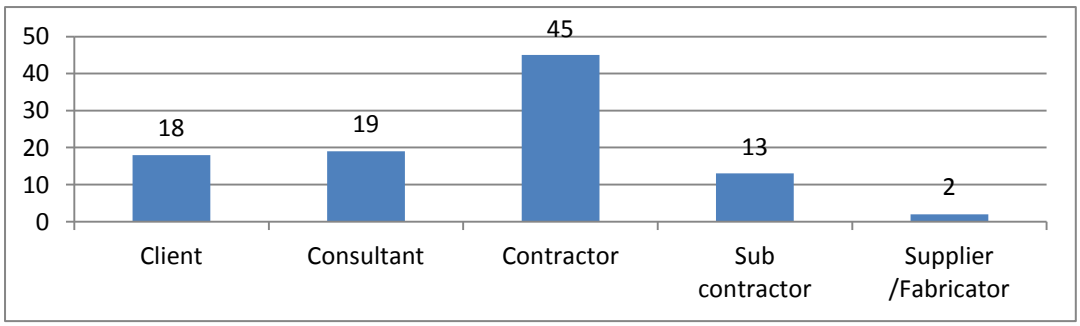

Figure 4.2: Organizational profile of the respondents

The years of experience of the respondents is shown in Figure 4.3

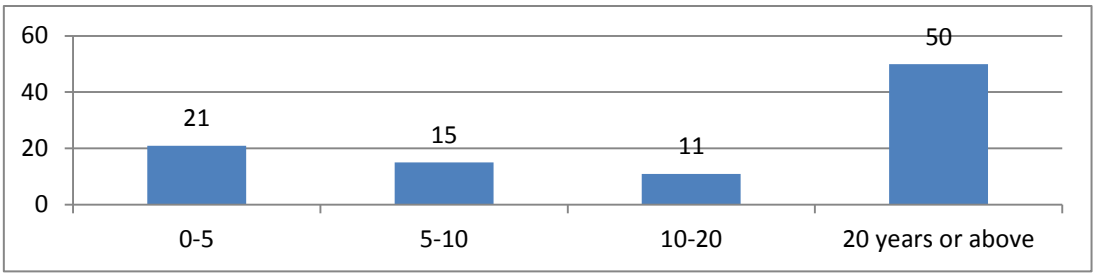

Figure 4.3: Years of experience

4.1.2 Results of Second survey

The reliability of the data came out to be 0.879 which indicates that the data is very reliable. The results were ranked on the basis of Relative importance (RII). The Table 4.1 shows the causes of disputes in the Pakistani construction industry.

Table 4.1: Causes of disputes in Pakistani construction industry

Factor	RII	Ranks
Delays in payments	0.517	1
Delays in work	0.494	2
Poor quality of works	0.471	3
Poor contractor selection	0.443	4
Change orders	0.413	5
Errors in drawings and specifications	0.409	6
Lack of proper supervision	0.4	7
Negative attitude of parties	0.388	8
Estimation errors	0.369	9
Changes in prices off materials and labors	0.358	10
Delay in reply to queries	0.353	11
Acts of God	0.345	12
Lack of communication	0.336	13
Acceleration/Suspension of work	0.335	14
Changed conditions	0.329	15
Health and safety issues	0.312	16
Restricted access to site	0.312	16
Contractual anomalies	0.306	18

The causes of disputes have been identified through literature and the survey in the Pakistani construction industry. Upon comparison it is found that

delays in payment is the highest ranked cause of dispute both according to literature and the professionals of the Pakistani industry. This is in agreement with the findings of Khahro and Ali (2014) that delays in payments is the most significant cause of dispute in the Pakistani industry. Change orders has been ranked 2nd according to literature but 5th in the Pakistani industry. This is also in perfect agreement with the findings of Farooqui et al. (2014) who have placed variations on the 5th position. Similarly Khahro and Ali (2014) has also ranked it on the 5th position in Pakistan. Change orders have been given significant position in the literature e.g. they have been ranked 1st by Zaneldin (2006) and Bassioni et al. (2007). There is a complete agreement of the literature and the Pakistani industry on the ranking of poor quality of works (3rd position). It has been agreed that cost, quality and time are the factors governing the project performance (Leong et al., 2014). Keeping this in view there is an increasing importance given to quality of works in construction these days (Ashokkumar, 2007).

The poorly executed works lead to reworks and increased maintenance cost and a dispute among the project participants. This justifies its 3rd position in the top ten lists. Delays in work has been ranked 2nd by the Pakistani industry and on 4th position according to the literature. It causes lawsuits, litigation, abandonment, over cost between the project participants in the Pakistani industry (Haseeb et al., 2011). Therefore it has been categorized as a significant dispute in the construction industry. Poor contractor selection has been ranked 4th by the Pakistani industry but it did not make it to the top 10 list in the literature review. Around 83% of contractors are selected on the basis of lowest bid in Pakistan (Khan and Abdul Qadir Khan, 2015). This may lead to selection of an incompetent contractor that results in disputes at a later stage due to poor quality of works, time and cost overruns etc. Owing to the low bid practice incompetent contractor selection is a significant dispute in the Pakistani industry. There is a significant difference in the position held by contractual anomalies in the literature and that in Pakistan. In Pakistan not much importance is given to the contract documentation as it has been indicated by Farooqui et al. (2014) that breaches of contract by the project participants is the least treacherous cause of dispute among the contract related

disputes. This shows the reason behind its lowest position in the Pakistani construction industry.

Errors in drawings and specifications have been ranked 6th by the literature and the construction industry. This is also in agreement with the findings of (Khahro and Ali, 2014) who have ranked the errors in project documents to be the 7th most significant cause of dispute in the Pakistani industry. Lack of proper supervision did not make it to the top ten list of the literature review but has been placed on 7th position by the Pakistani industry. It appeared in 5/33 research papers thus showing that as per the literature it is not a significant factor but Pakistani industry requires a proper supervision of the construction project. On the similar grounds Negative attitude of parties appeared in 6/33 research papers but it made to the top ten list in the Pakistani industry. Also there is a difference of opinion on lack of communication and changed conditions. But on the whole it can be seen that 4 out of top 5 causes of disputes are common in the literature and the Pakistani construction industry. This depicts an agreement on the critical causes of disputes in the construction industry.

4.2 SECOND SURVEY

The next step conducted after the first survey was development of preliminary questionnaire that could lead to formulation of a detailed survey to identify the disputes between the general contractor and the subcontractor. The factors which were considered during the pilot survey were derived from extensive literature review. The factors are shown in Table 4.2. A total of thirty seven factors were considered.

Table 4.2: Factors considered during pilot survey

Serial No	**Factors**
1	Delays in payment
2	Change orders
3	Contractual anomalies

4	Quality of work
5	Errors in drawings and specifications
6	Lack of communication
7	Delays in work
8	Changed conditions
9	Delay in reply to queries by main contractor
10	Changes in prices of materials and labors
11	Poor scheduling practices
12	Acceleration/Suspension of work
13	Estimation errors
14	Acts of God
15	Restricted access to site
16	Incompetent subcontractor
17	Low bidding practice
18	Negative attitude of parties
19	Lack of proper supervision
20	Health and safety issues
21	Risk allocation
22	Lack of familiarity with local laws
23	Unrealistic expectations
24	Extensions of time
25	Exaggerated claims
26	Adversarial relationship
27	Team lacking spirit
28	Contractor provided material
29	Extra works
30	Assigning part of subcontract without informing the subcontractor already executing the works
31	Low experience of main contractor
32	Absence of main contractor from site
33	Avoiding instructions given by main contractor

34	Technical competence of team
35	Absence of subcontractor from site
36	Partnering with other subcontractors without the consent of main contractor
37	Using distant material storage site

As the survey was conducted through face to face interviews with professionals of the construction industry the respondents told that many of these factors indicated the same meaning like poor scheduling practice (S.no 11) and delays in work (S.no 7) conveyed the same meaning. Similarly technical competence of team (S.no 34) and Incompetent subcontractor (S.no 16) had almost same meaning. The pilot survey therefore gave an insight to the factors considered as the root cause of dispute between the contractor and subcontractor. Therefore two factors i.e. technical competence of team and poor scheduling practice was taken out from further consideration. The years of experience of the respondents of the pilot survey are as follows (Fig 4.4)

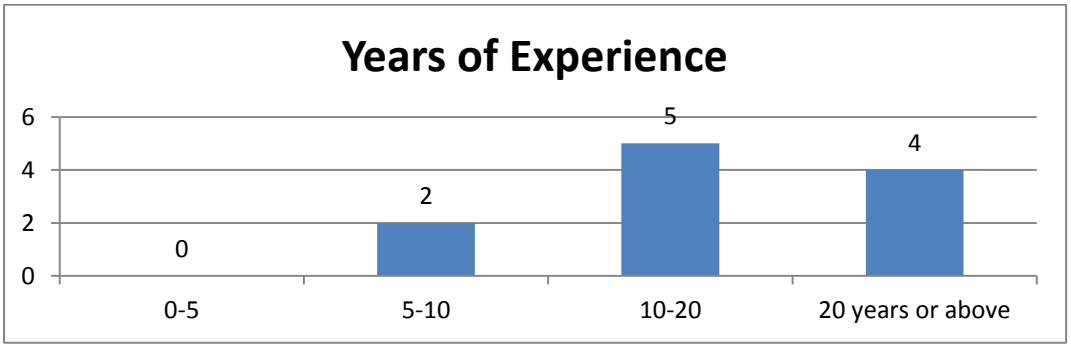

Figure 4.4: Experience of pilot survey respondents

It can be seen that 82% of the respondents have experience of more than 10 years. This indicates a sufficient experience to respond to the pilot survey. The type of organization to which the respondents belonged is shown in Figure 4.5.

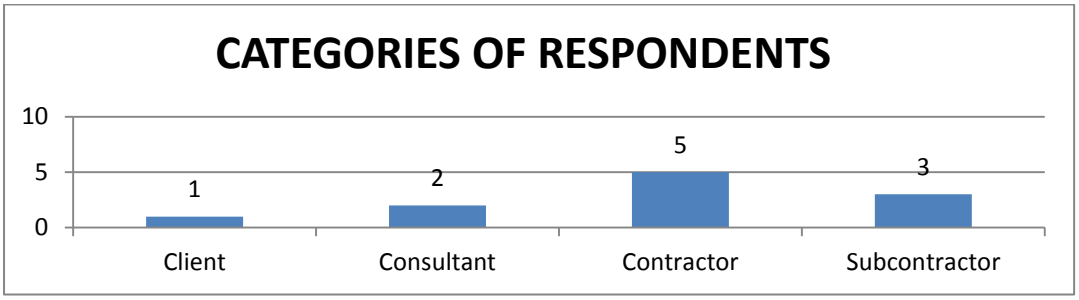

Figure 4.5: Organizational background of pilot survey respondents

Since the further survey will be based on general contractor and subcontractor relationship therefore the representatives of these two parties were targeted for the pilot survey. The position of the respondents in their organization is shown as follows (Table 4.3)

Table 4.3: Position of pilot survey respondents

Position in organization	Type of organization	No. of respondents
Project manager	Client	1
Site Manager	Consultant	2
Senior upper management	Contractor	3
Site Engineer	Contractor	2
Owner	Subcontractor	3

Many factors were taken out from the research based upon the responses from the respondents. The factors for which at least 60% of the respondents agreed that it could become a cause of dispute between the general contractor and subcontractor were carried forward to the detailed survey. Twenty factors passed this screening through pilot survey. The factors excluded from the survey include Contractual anomalies, Changes in prices of materials and labors, Poor scheduling practices, Acts of God, Lack of familiarity with local laws, Low bidding practice, Health and safety issues, Risk allocation, Restricted access to site, Lack of familiarity with local laws, Unrealistic expectations, Extensions of time, Adversarial relationship, Team lacking spirit, Low experience of main contractor,

Technical competence of team, Using distant material storage site. Rests of the twenty factors out of thirty seven factors were considered for further research.

The survey was sent to professionals belonging to Clients, Consultant, Contractor, Subcontractors and other construction claims experts. All the stakeholders were involved to get their point of view on this issue. The survey to international professionals was sent via emails and social networking websites and telephone. In Pakistan, the survey was sent to relevant persons through email and through visits to various construction sites. Getting responses by visiting the construction sites was an easier task. Many responses were obtained by personally visiting the construction sites and filling the survey through face to face discussions. Obtaining responses from international persons was a tedious task. An extensive campaign was carried out to get the desired number of responses.

4.2.1 Reliability of data

The reliability of data was determined using Cronbach's Alpha method that came out to be 0.88 which is well within the acceptable range.

4.2.2 Stripping of data The 204 responses obtained were divided into three strips.

4.2.2.1 Strip 1

Strip 1 consists of developed countries that include Australia, Canada, Belgium, France, Germany, Italy, United Kingdom and USA. A total of 45 responses fall into this strip. Respondents consist of 1 client, 3 consultants, 21 contractors and 20 subcontractors. 27/45 respondents have more than 10 years ,8 have more than 20 years of experience, 3 have 5-10 while 7 have 0-5 years of experience.

4.2.2.2 Strip 2

Strip 2 consists of responses from Middle East countries that include Saudi Arabia, UAE, Oman and Qatar. A total of 52 responses fall in this group, out of which 31 are contractors, 19 subcontractors, 1 consultant and 1 client. 37/52 respondents have more than 20 years of experience, 3 have 10-20 years, 8 have 5-10 while 4 have 0-5 years of experience.

4.2.2.3 Strip 3

Strip 3 consists of South Asian countries. A total of 107 responses have been obtained from them which originate from India, Bangladesh, Afghanistan and Pakistan. Out of these respondents 35 are contractors, 15 clients, 37 subcontractors and 20 consultants. 73/107 respondents have more than 20 years of experience, 5 have 10-20 years, 15 have 5-10 years while 14 have 0-5 years of experience. . The more responses in this group are due to the fact that one of the countries in this strip is Pakistan which is a local industry. .

It is evident that in all strips most answers have been obtained from Contractors and Subcontractors. The research topic is focused on their relationship and therefore they were mainly targeted during the survey

4.3 RESULTS OF SECOND SURVEY

4.3.1 Percentage of subcontracting

The respondents were asked about the percentage of subcontracting in their country. The results are shown in Figure 46.

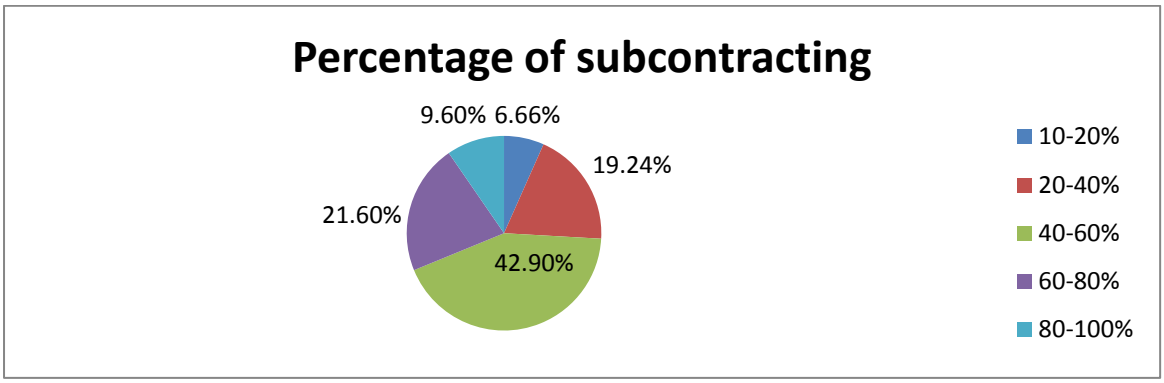

Figure 4.6: Percentage of subcontracting

It can be seen that majority of respondents i.e. 42.9% report that the percentage of subcontracting these days in the construction industry is between 40-60%. While 21.60% report that it is between 60-80%. Hence the percentage of subcontracting these days in the construction industry is somewhere around 60%.

The risks posed by dispute causing factors in the three strips are shown in Table 4.4 to 4.7

Table 4.4: Risks between general contractor and subcontractor in Strip 1

Factor	RII	Rank
Delays in work	0.707	1
Delays in Payments	0.694	2
Lack of communication	0.645	3
Change orders	0.634	4
Poor quality of works	0.584	5
Errors in drawings and specifications	0.577	6
Acceleration/suspension of work	0.554	7
Incompetent subcontractor	0.540	8
Negative attitude of parties	0.524	9
Contractor provided material	0.524	9
Delay in reply to queries	0.517	11
Extra works	0.515	12
Estimation errors	0.502	13
Changed conditions	0.500	14
Lack of proper supervision	0.500	14
Exaggerated claims by the subcontractor	0.48	16
Avoiding instructions given by general contractor	0.48	16
Absence of general contractor from site	0.433	18
Assigning subcontracted works to another party without informing the subcontractor	0.424	19
Absence of subcontractor from site	0.228	20

Table 4.5: Risks between general contractor and subcontractor in Strip 2

Factor	RII	Rank
Delays in Payments	0.697	1
Delays in work	0.656	2
Incompetent subcontractor	0.622	3
Negative attitude of parties	0.616	4
Poor quality of works	0.609	5
Change orders	0.595	6
Estimation errors	0.591	7
Lack of communication	0.589	8
Acceleration/suspension of work	0.585	9
Errors in drawings and specifications	0.563	10
Exaggerated claims by the subcontractor	0.563	10

Lack of proper supervision	0.559	12
Delay in reply to queries	0.553	13
Contractor provided material	0.550	14
Avoiding instructions given by general contractor	0.544	15
Extra works	0.53	16
Absence of general contractor from site	0.497	17
Assigning subcontracted works to another party without informing the subcontractor	0.486	18
Changed conditions	0.477	19
Absence of subcontractor from site	0.308	20

Table 4.6: Risks between general contractor and subcontractor in Strip 3

Factor	RII	Rank
Delays in Payments	0.6923	1
Delays in work	0.668	2
Incompetent subcontractor	0.6228	3
Poor quality of works	0.6146	4
Negative attitude of parties	0.6022	5
Exaggerated claims by the subcontractor	0.597	6
Lack of proper supervision	0.5921	7
Estimation errors	0.5869	8
Change orders	0.5847	9
Lack of communication	0.5828	10
Errors in drawings and specifications	0.569	11
Contractor provided material	0.5585	12
Absence of general contractor from site	0.5544	13
Acceleration/suspension of work of work	0.5529	14
Delay in reply to queries	0.5391	15
Avoiding instructions given by general contractor	0.5391	15
Changed conditions	0.5312	17
Extra works	0.508	18
Assigning subcontracted works to another party without informing the subcontractor	0.4968	19
Absence of subcontractor from site	0.3125	20

Table 4.7: Spearman correlation

			Strip1	Strip2	Strip3
Spearman's rho	Strip1	Correlation Coefficient	1.000	.809**	.637**
		Sig. (2-tailed)	.	.000	.003
		N	20	20	20
	Strip2	Correlation Coefficient	.809**	1.000	.908**
		Sig. (2-tailed)	.000	.	.000
		N	20	20	20
	Strip3	Correlation Coefficient	.637**	.908**	1.000
		Sig. (2-tailed)	.003	.000	.
		N	20	20	20

The correlation between Strip 1 and Strip 2, Strip 2 and Strip 3 is very strong. This shows that the risks between the general contractor and subcontractor are very similar in developed countries and Middle East. A similar trend is observed in Middle East and South Asia. The correlation between Strip 1 and Strip 3 is moderately strong which shows that there is some difference in risks between the two parties in the developed countries and South Asia. This leads to a conclusion that the risks between the general contractor and subcontractor are very similar throughout the world. The risks that are in the top 5 list in all three strips include delays in payments, delays in work and poor quality of works. These three factors alone cause around 20% of the issues between the general contractor and the subcontractor. It has been found that a similar trend has been observed in the researches carried out before as shown in Figure 4.7. Al-Hammad (1993) carried out the research in Saudi Arabia, Enshassi et al. (2012) in Palestine and Okunlola (2015) carried out the research in Nigeria.

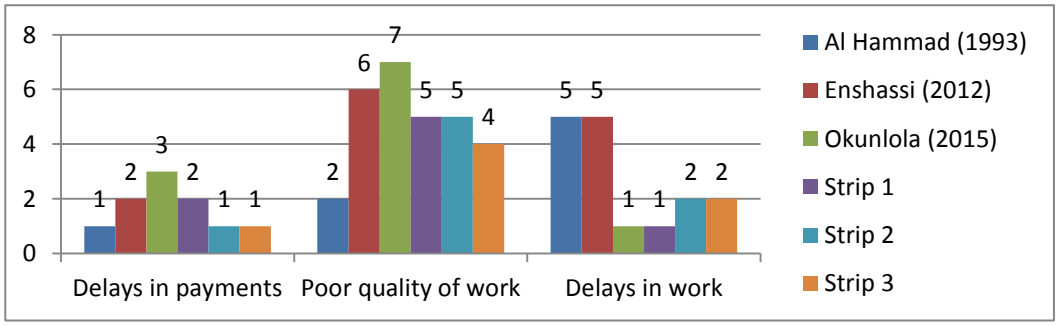

Figure 4.7: Comparison with literature review

Delays in payment are among the top 2 risks in all three strips. This is in agreement with Al-Hammad (1993) who ranked it as the top most dispute causing issue between the general contractor and the subcontractor. The research carried out in 1993 in Saudi Arabia is in a perfect agreement with that conducted in Middle East in 2016. Other authors also have a similar point of view. The construction industry has been unable to resolve this issue in the past twenty three years. Delays in payments lead to time and cost overruns and have a disastrous impact on the project. The parties like subcontractors are more vulnerable to the effects of delayed payments (Ye and Rahman, 2010). This issue needs to be resolved immediately by binding the contractor to pay the subcontractor in time through contractual provisions. Often "paid when paid clause" are included in the contracts with the subcontractor. This creates a huge amount of financial impact on the subcontractors (Thomas and Flynn, 2011) Poor quality of works was reported to be the 2nd most dispute causing factor in 1993. The construction industry reacted to this problem and it was reported on 6th and 7th position in 2012 and 2015 respectively. A similar trend has been observed in the present research where it is on the 4th and 5th positions. Poor quality of works has been identified by Gunderson and Cherf (2012) as a negative attribute of the subcontractor. The contractor has to hand over the works executed by the subcontractor to the contractor. The works executed by them should satisfy the architect/engineer. In case subcontractor executes works of poor quality the contractor is ultimately affected.

When works are faulty reworks are required or some additional costs are spent on its maintenance (Ashokkumar, 2007). Owing to this fact there is an increasing emphasis on ensuring quality of works. Quality of work is a high priority in Pakistani construction industry according to the view point of contractors. (Asim et al., 2013). This has been depicted in the results of this research as well. Similarly in Saudi Arabia poor quality of works is the 4th most disputes causing factor. In India the emphasis on the quality of works is increasing with time. The construction projects are known for their poor quality however now the construction industry is adopting quality management procedures to improve the quality of works (Ashokkumar, 2007). Thus the 2nd position of poor quality of

works in 1993 which has now moved to 4th and 5th position will further improve in the future. Delays in work were placed on 5th position in the researches carried out in 1993 and 2012. However in 2015 it was placed on 1st position recently (Okunlola, 2015). A similar trend has been observed in the present research where it has been placed on 1st and 2nd position. This depicts that the risk caused by delays in work have increased since 1993.

Lack of communication is in the top ten list in all three strips. It was also ranked on the 5th position by Al-Hammad (1993) thereby indicating that it has been a significant risk since that time. Mitkus and Mitkus (2014) argued that the lack of communication is the basis of all the disputes in the construction industry. The contract document can be taken a communication tool among the project participants (Mitkus and Mitkus, 2014). The contract document should be vocal about the critical disputes between the parties. In Pakistan there is no standard subcontract between the general contractor and subcontractor and owner produces their own form of contract that contains onerous conditions (Choudhry et al., 2012). Also it was reported by Thomas and Flynn (2011) that the contract contains harsh conditions for the subcontractor. Hence balanced contractual terms should be employed which can then serve as an effective communication instrument as well. Incompetent subcontractor is at the 8th position in Strip 1 and at the third position in 2nd and 3rd strip. .This factor was not considered in the previous researches carried out to determine causes of disputes between the general contractor and the subcontractor. However Akintan and Morledge (2013) stated that the collaboration between the contractor and subcontractor is affected when the subcontractor lacks managerial competence. Barough et al. (2013) have also reported that incompetent subcontractor is a critical dispute causing factor that needs resolution. The subcontractors were solely selected on the basis of price (Tommelein and Ballard, 1997) earlier on however in UK factors other than price are also considered during their selection (Lavelle et al., 2007). Due to this reason incompetent subcontractor is not a high risk in Strip 1 when compared to other two strips. However in under developed countries the practice of low bid selection still persists which forms the basis of its 3rd position in Strip 3.

The change orders issued by either the client or consultant also creates strain in general contractor and subcontractor's relationship. It is present on 4th position in Strip 1 and in the top 10 list of other two strips thereby indicating its impact all over the world. Change orders has also been ranked 4th by Enshassi et al. (2012) in consultant caused problems in the general contractor and subcontractor's relationship. Change orders cause delays and cost overruns (Goodrum et al., 2010). This can be avoided by carrying out proper selection of construction management firms, early and proper definition of project scope, value engineering and constructability reviews (Günhan et al., 2007). Errors in drawings and specifications is another factor found in the top 10 list in Strip 1-2 In South Asia, however it is on the 11th position. This has been ranked 3rd in consultant caused problems by Enshassi et al. (2012). It has been ranked 8th significant cause of dispute by Khahro and Ali (2014) out of 16 factors considered as a cause of dispute in the construction industry of Pakistan. This shows that it is not considered to be a very high priority issue in Pakistan and therefore it can be said that a similar trend exists in other South Asian countries. Negative attitude of parties has been ranked 4th and 5th by Middle East and South Asia respectively. According to Akintan and Morledge (2013) negative attitude is shown by the main contractor towards the subcontractor. This leads to a situation where collaboration among the parties is not possible. In developed countries there is therefore a greater chance of collaboration between the general contractor and subcontractor. Lack of proper supervision ranked 7th in the South Asia is not present in the top 10 list of all other strips. In Pakistan contractors have placed this factor on the 5th position. Proper site management is considered to be a critical success factor in the construction industry which justifies its position in the top 10 list (Saqib et al., 2008, Sugumaran and Lavanya, 2014) of South Asian countries where its absence can create risk among the two parties. In developed countries however proper supervision is carried out and it does not create any strain in the relationship between the two parties as indicated by the results of this research. Exaggerated claims by the subcontractor made it to the top 10 list in Strip 2 and Strip 3. This shows that there are lesser chances that any issue will be created due to exaggerated claims in Strip 1 that consists of developed countries. This agrees with

the fact that exaggerated claims has been ranked to be among the top causes of disputes in the Pakistani construction industry (Farooqui et al., 2014). Estimation error is on the 7th and 8th position in Strip 2 and 3. It has been placed at 5th indirect cause of dispute in Saudi Arabia (Mahamid, 2014) thereby showing a near agreement.

4.4 RESULTS OF THIRD SURVEY

This survey was conducted for local professionals only. The questionnaire was sent online to 132 professionals and 50 were distributed by hand to various sites. A total of 101 responses were obtained. This constitutes a response ratio of 55.49%.

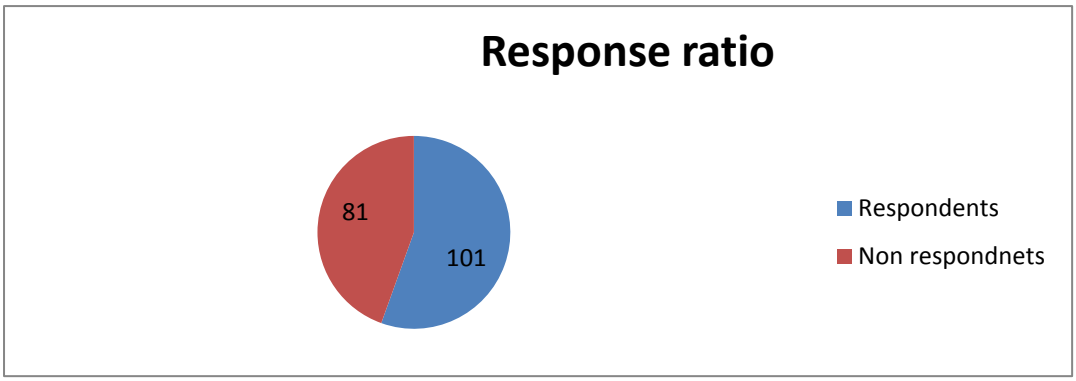

Figure 4.8: Response graph-Third survey

Figure 4.9 shows the organizational profile of the respondents

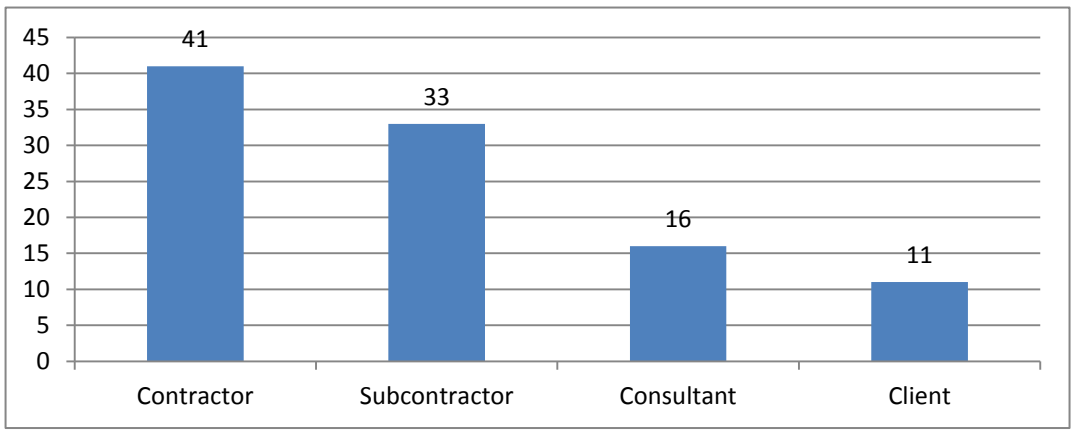

Figure 4.9: Organizational profile of second survey

The main target of the survey was professionals from Contractor and subcontractor organizations. The responses obtained from them constitute 73.26% of the total responses. This shows that an adequate response has been received from the targeted organizations. Client and consultants were also involved to incorporate the point of view of all the parties of the construction projects. The educational background of the respondents is shown in Figure 4.10.

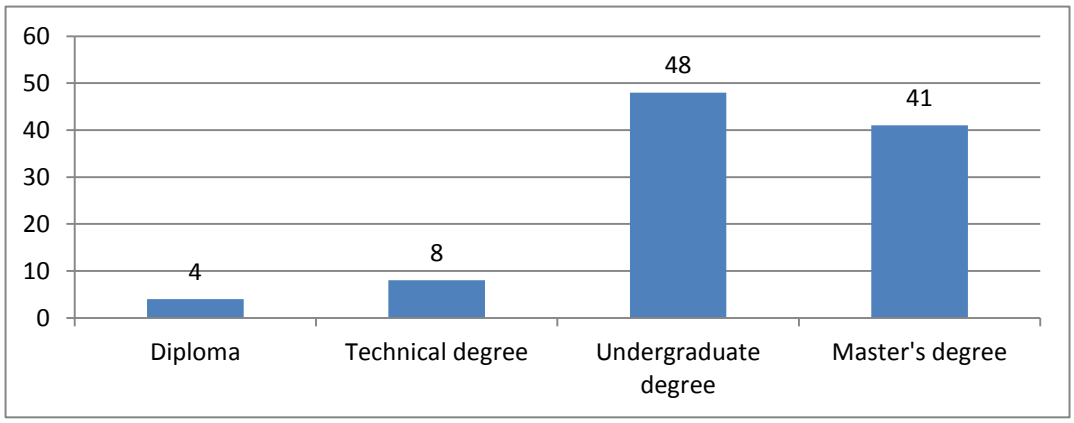

Figure 4.10: Educational profile of respondents of second survey

The maximum numbers of respondents i.e. 48 had an undergraduate degree while those having a Master's degree were 41 in number. Diploma holders and those having technical degrees are also part of the survey and were 12 in number. The positions which the respondents hold in their organizations are shown in Table 4.8.

Table 4.8: Position respondents hold in their organization

Position in organization	**Client**	**Consultant**	**Contractor**	**Subcontractor**	**Total number of respondents**
Assistant Director	3	2			5
Project Manager	3		12	6	21
Construction Manager			2	1	3
Assistant manager	1			1	2
Building				1	1

inspector					
Chief Executive Officer		1	1	1	3
Contract Engineer		1			1
Contracts Manager		2			2
Deputy Director Planning and Design		2			2
Design Engineer		2			2
Director			1	2	3
General Manager			2	3	5
Junior Engineer		4			4
Managing Director			1	2	3
Owner			2	8	10
Planning and Cost Engineer			1		1
Planning Engineer			8	2	10
Project control executive			1		1
Project Coordinator	4				4
Project Engineer			1	2	3
Quantity Surveyor				1	1
Senior Engineer			2		2
Senior Engineer (Contracts)			1		1
Site Engineer		1	5	3	9
Site Manager		1	1		2

The years of experience of the respondents is shown in Figure 4.14

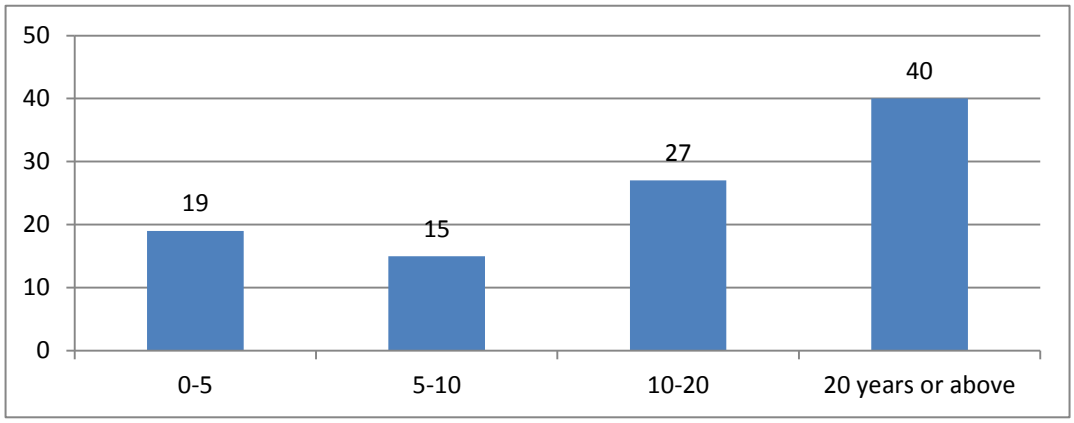

Figure 4.11: Years of experience of respondents of third survey

A total of 67 out of 101 respondents had an experience of at least 10 years. Those having 5-10 years of experience were 15 in number. This shows that 82 respondents have at least 5 years of experience which constitutes 81.18% of the total responses. The respondents with 0-5 years of experience were 19 in number. This shows that the targeted audience has sufficient experience to give answers to the questions asked in the survey.

A total of twenty nine questions were asked. The respondents were asked to select the provision they consider is best for general contractor and subcontractor's relationship. Based upon their responses the recommendations for the general conditions of contract can be formulated which after being discussed with legal experts can be finalized. The questions asked were multiple choice questions. The respondents could select any one of the options while they were also given an opportunity to select more than one option. There was an option titled "Respondents recommendation" with all questions in which those answering the survey were asked to give their own point of view regarding some particular provision which they think could be a suitable condition for the general contractor and subcontractor's relationship if it was not present in the options indicated in the question.

The following paragraphs contain the questions asked and the responses received

Q1. *When should the subcontractor enter into the subcontract?*

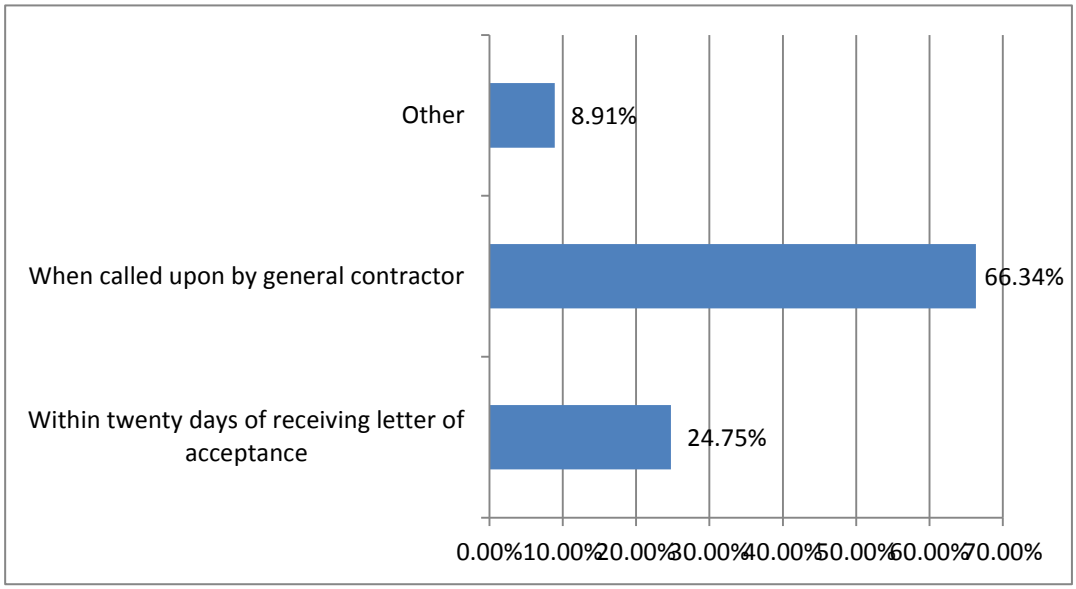

Figure 4.12: Response to question number 1 of third survey

A total of 66.34% of the respondents considered that the subcontractor should enter into the subcontract when asked by the general contractor(The Government of Hong Kong Special Administration Region Subcontract for Building Works 2000) edition while 24.75% consider that it should be within twenty eight days of letter of acceptance. In respondents recommendation's option following suggestions were made

- Within 14 days,
- Two respondents said that within 7 days
- 15 days
- No such work policy
- On receiving work order
- Depends upon binding of client. if client has no binding then on the will of contractor
- When both the general contractor and subcontractor enter into an agreement and a legal binding, completely sorting out the pros and cons of the project so that no delay can occur once the contract is awarded

- As soon as subcontractor receives the work order

Q2: *Who should depute a representative on site?*

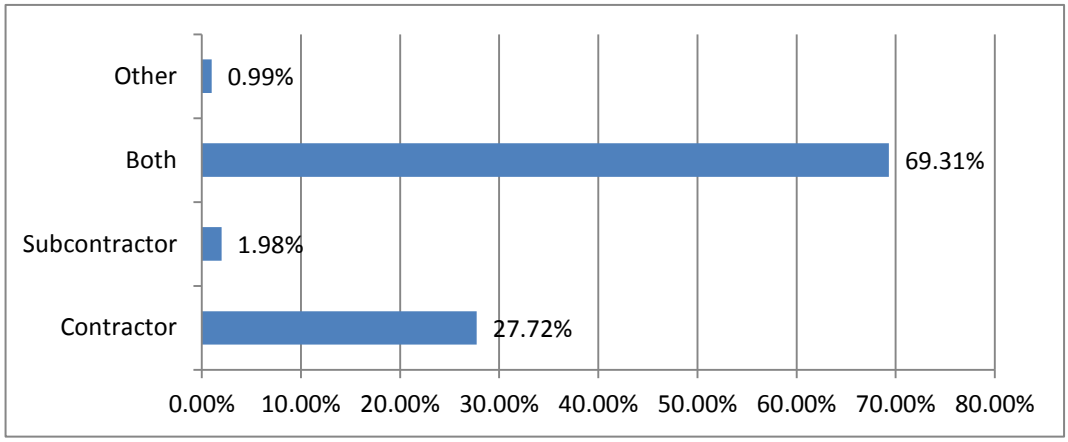

Figure 4.13: Response to question number 2 of third survey

Both subcontractor and contractor should depute a representative on site as indicated by 69.31% respondets. A total of 27.72% respondents consider that only contractor should depute a representaive on site while only 1.98% state that subcontractor should do so. Only 1 respondent suggested that Employer should send a representive on site. Most respondents agree with "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011**".**

Q3: *If a representative is deputed by the contractor on site, should he have the power to give decisions on time, cost, quality and other affairs related to the execution of project*?

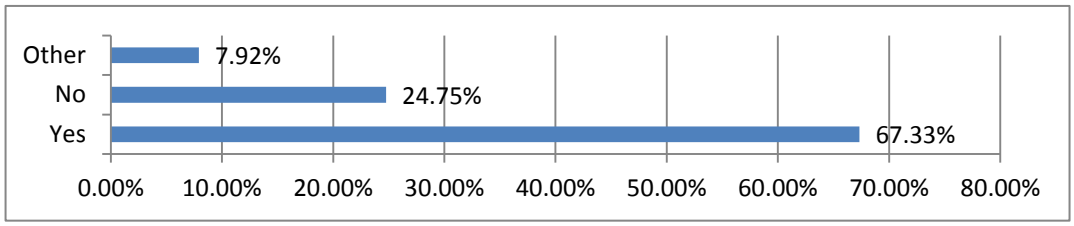

Figure 4.14: Response to question number 3 of third survey

This is a provision stated by "Conditions of Subcontract by Construction Industry Development Board Malaysia" to which 67.33% respondents agree. Majority of the professionals are in the favor that a contract administrator having a power to give decisions on cost, quality and time and other contractual issues should be deputed by the contractor on site.

The following suggestions were also made by the respondents regarding the contractor administrator

- Should have such powers if contract administrator is also project manager,
- Some limits should be defined for their authority
- Should only assure quality
- Complete information to supervisors should be provided regarding powers of contract administrator
- To respondents state that engineer in charge should have authority to give these decisions
- Yes, but should be cross checked by clients representative
- Should not give decisions on cost but can do it for quality and time

Q4: *When should the execution of project be started by the subcontractor*?

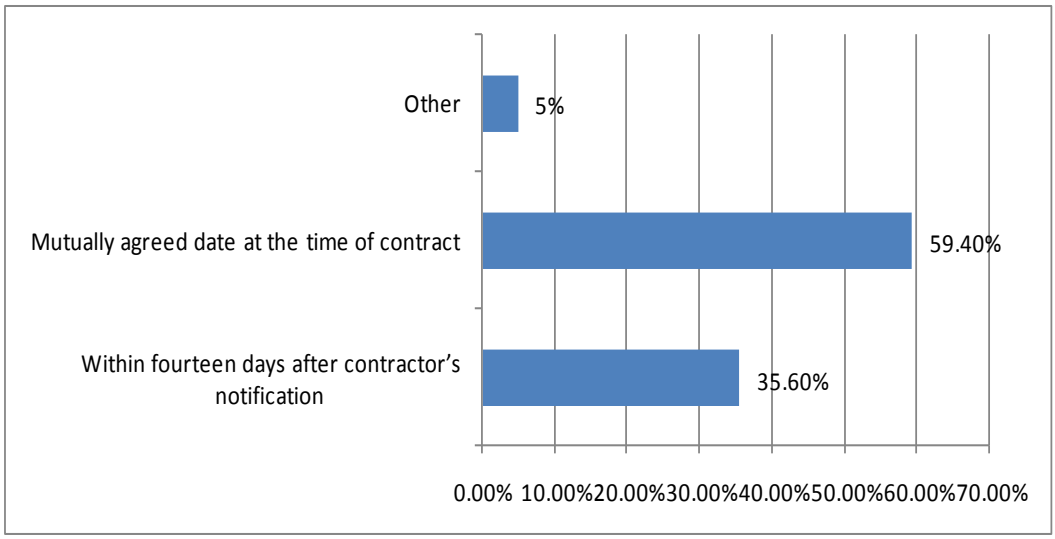

Figure 4.15: Response to question number 4 of third survey?

Maximum respondents i.e. 59.40% agree that execution should start at mutually agreed date at the time of contract. This was not a provision in any of the conditions of subcontract studied in literature review but was added based on standard practice prevalent in the contractor-subcontractor relationship in Paksitan and majority of those answeing the survey agreed with that. Only 35.60% of the respondents agreed with "FIDIC conditions of subcontract for works of civil engineering construction, 1994" that is should begin within fourteen days after contractor's notification. Other recommendations made for this question are as follows

- Three respondents stated that it should be started immediately after work order
- Two respondents suggested that it should be within a week after contractor's notification.

Q5: *In case of errors in design what should subcontractor do*?

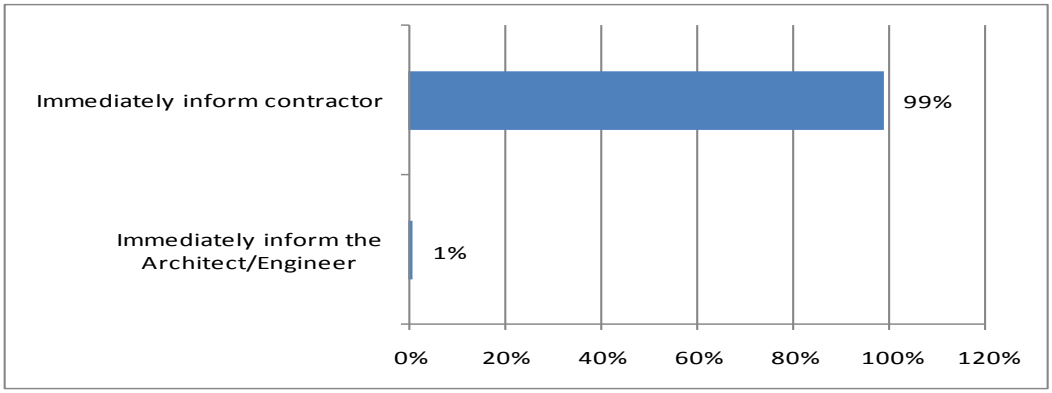

Figure 4.16: Response to question number 5 of third survey

99% of the respondents agreed that subcontractor should inform the contractor immediately if there are any errors in drawings and specifications. No changes have been proposed by the respondents. This is in agreement with the provision stated by FIDIC in 1994 and 2011 that contractor should be informed immediately in case of errors in drawings and specifications.

Q6: *In which case the extensions of time should be given to the subcontractor*?

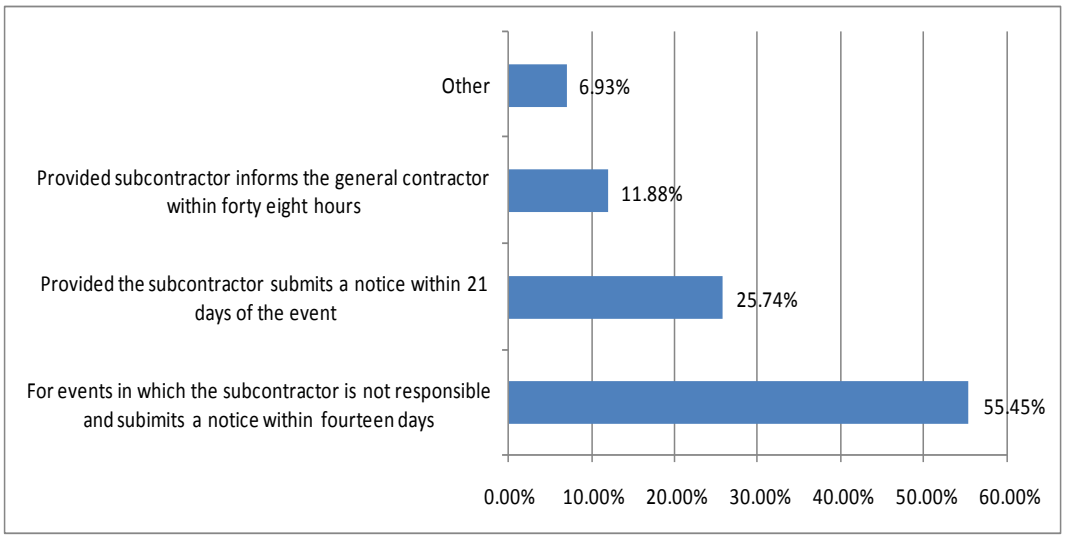

Figure 4.17: Response to question number 6 of third survey

The 55.45% of the respondents agree with "FIDIC conditions of subcontract for works of civil engineering construction, 1994" that for all events in which subcontractor is not responsible an extension of time should be provided in case a notice is submitted within fourteen days of the event. The 25.74% of the respondents agree with the rule that subcontractor should submit notice within 21 days to be eligible for the extension of time as proposed by "The Government of Hong Kong special administration region subcontract for building works 2000 edition". Only 11.88% respondents agree with "Associated General Contractors of California long form standard subcontract" that a notice should be given within 48 hours for the extension. The other recommendations given are as follows

- Subcontractor should inform the contractor within a week
- In case of stoppage of funds from agency extensions should be provided
- For events in which subcontractor is not responsible and submits a notice within 21 days,
- Three respondents stated that for events in which subcontractor is not responsible and submits a notice within forty eight hours an extension should be provided
- Extension can be given provided a notice is submitted within 15 days

Q7: *Works executed by the subcontractor should satisfy*?

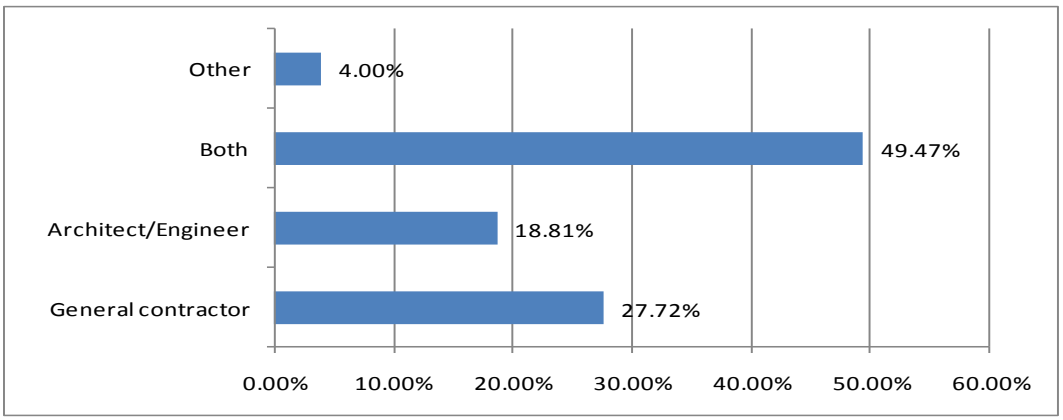

Figure 4.18: Response to question number 7of third survey

The 49.47% of the respondents agree with the provision suggested by "The Government of Hong Kong special administration region subcontract for building works 2000 edition". While 27.72% and 18.81% of the respondents' state that it should satisfy general contractor and architect/engineer respectively. Other suggestions given are as follows

- Works should satisfy all technical people
- According to three respondents, in addition to contractor and architect/engineer, works should satisfy client as well.

Q8: *In case of conflict which conditions of contract should prevail*?

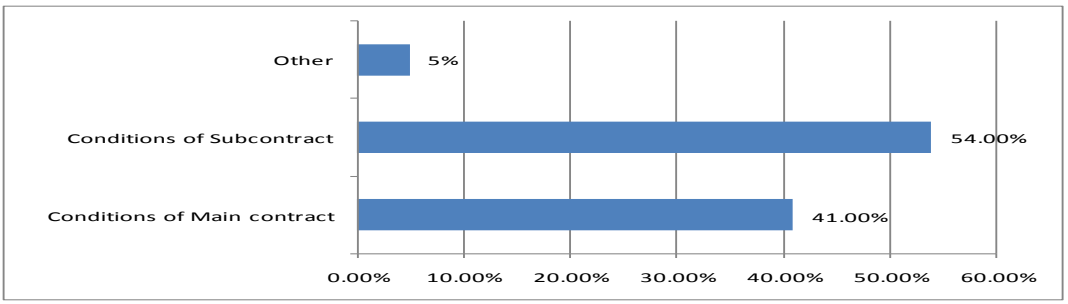

Figure 4.19: Response to question number 8 of third survey

54% of the respondents did not agree with the suggestion given by "The Government of Hong Kong special administration region subcontract for building works 2000 edition". Instead the majority voted for the conditions of subcontract to prevail in case of conflict between the main contractor and subcontractor. Other recommendations are as follows

- Both condition of subcontract and main contract shall prevail
- Conditions of subcontract shall prevail if formally signed by the subcontractor
- Conditions of subcontract with dispute resolution mechanism included should prevail
- It depends upon weather subcontract is selected by client approval or not and if there are provision for the subcontracted work in main contract.

Q9: *Should subcontractor be given access to main contract except its price part*?

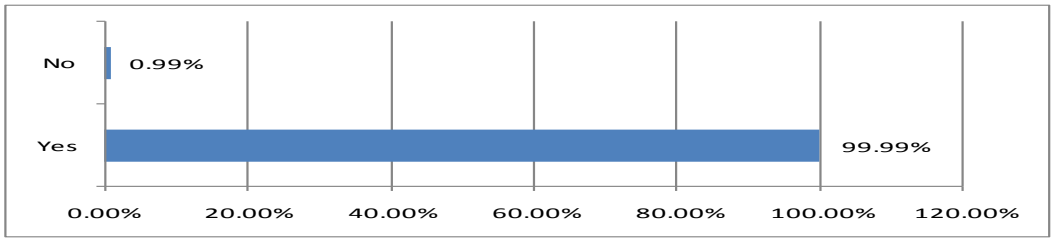

Figure 4.20: Response to question number 9 of third survey

Almost all the respondents agreed that access to main contract except its price part should be given to the subcontractor. This is in concordance with the provision given by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and "The Government of Hong Kong special administration region subcontract for building works 2000 edition".

Q10: *Who holds the responsibility of health and safety*?

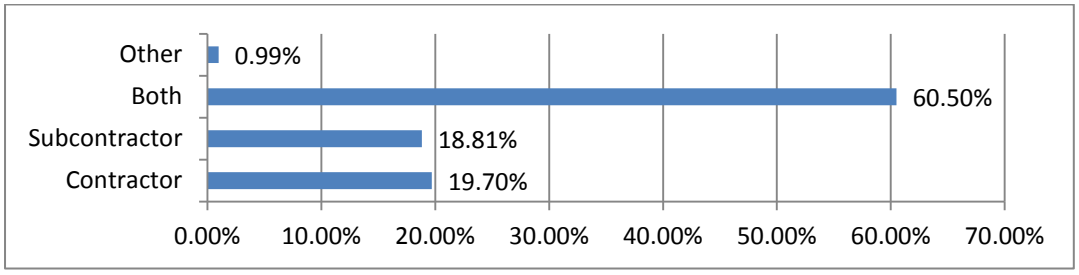

Figure 4.21: Response to question number 10 of third survey

The 60.50% respondents are in favor of "Conditions of Subcontract by Construction Industry Development Board Malaysia". The "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and "The Government of Hong Kong special administration region subcontract for building works 2000 edition" and "Associated General Contractors of California long form standard subcontract" have placed this responsibility on subcontractor to which only 18.81% respondents agree. It is contractors responsibility according to 19.91% responses and in only one answer it has been left on the contract terms

Q11: *Should contractor submit a waste management plan?*

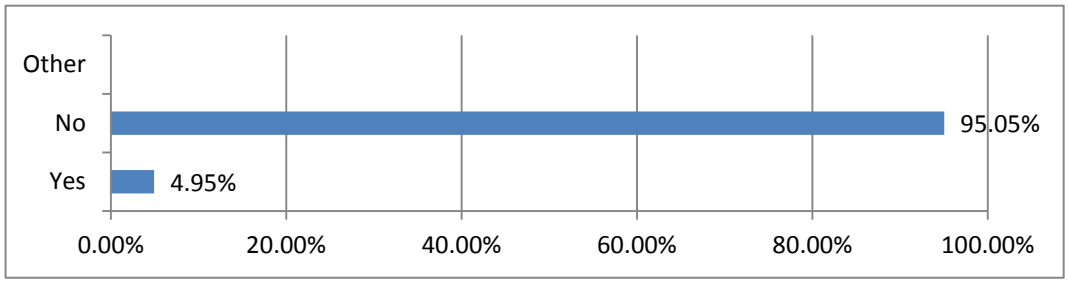

Figure 4.22: Response to question number 11 of third survey

Only 4.95% of the respondents agree with the condition mentioned in "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" that waste management plan should be submitted by the subcontractor while others disagree with it.

Q12: *When should the bonds and securities be provided to the contractor by the subcontractor?*

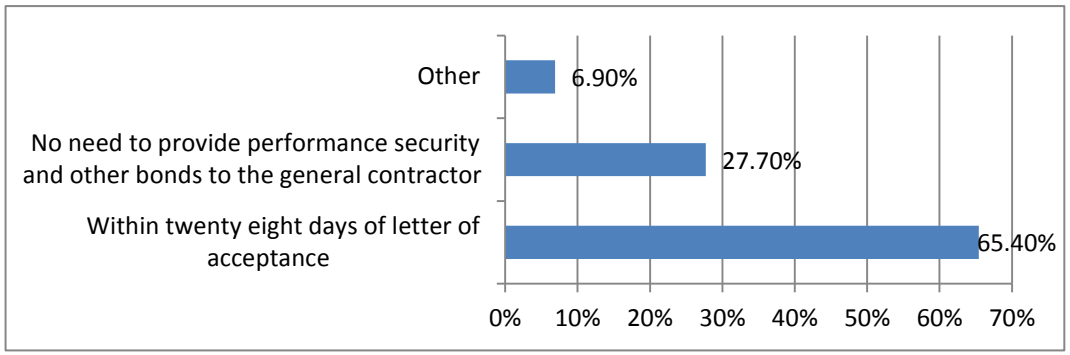

Figure 4.23: Response to question number 12 of third survey

The majority of the respondents agree with the condition mentioned in ", FIDIC conditions of subcontract for works of civil engineering construction, 1994" and "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011 while 27.70% agree with the clause given in "The Government of Hong Kong special administration region subcontract for building works 2000 edition". In respondents recommendation option following suggestions were made

- According to three respondents it should be within fourteen days
- Two respondents stated that in case mobilization advance is provided to the subcontractor the securities can be provided
- Before the final plan discussion, security should be provided
- It should be submitted at mutually agreed date at the time of contract

Q13: *Sub sub contracting should take place with whose consent?*

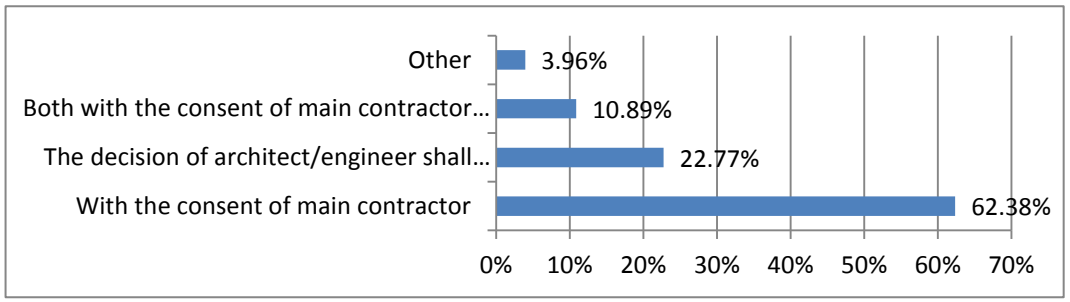

Figure 4.24: Response to question number 13 of third survey

The provision mentioned in FIDIC conditions of subcontract for works of civil engineering construction, 1994", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" that the subcontracting should not take place without the consent of main contractor has been agreed by 62.83% respondents. Only 10.89% agree with "The Government of Hong Kong special administration region subcontract for building works 2000 edition" that it should be with the consent of main contractor and the decision of architect/engineer shall prevail. Architect/Engineer's decision has been considered supreme by 22.77% respondents. In respondents recommendation option following suggestions have been made

- Sub sub contracting should be avoided because quality cannot be obtained in such projects
- If main contract with client holds restriction of nominated subcontracting and limited sub subcontracting then architect/engineer's decision shall prevail
- This practice should not be promoted
- It may take place to get the desired quality of work and expertise

Q14: *Schedule of activities should be submitted by?*

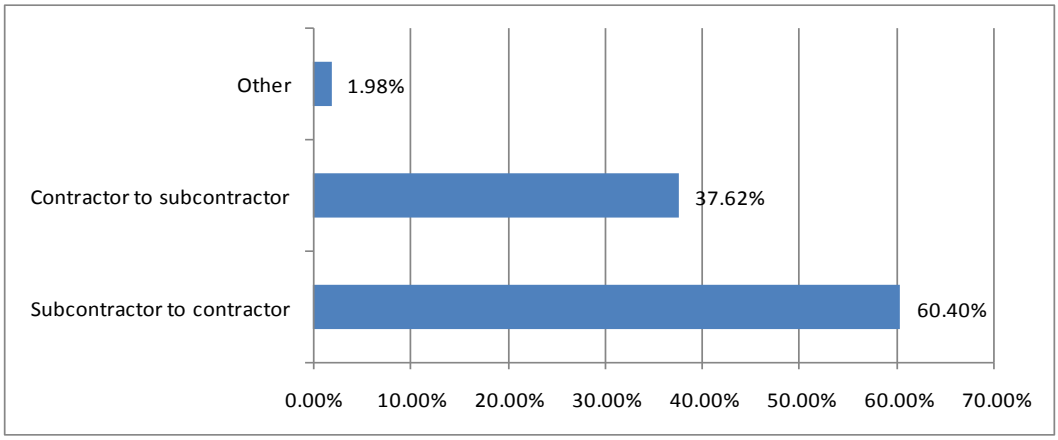

Figure 4.25: Response to question number 14 of third survey

The provision stated by “FIDIC conditions of subcontract for works of civil engineering construction, 1994”, “The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011”, “Associated General Contractors of California long form standard subcontract” has been agreed by 60.40% respondents. ”. The 37.62% respondents agree with “Conditions of Subcontract by Construction Industry Development Board Malaysia”, “American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor” and “The Government of Hong Kong special administration region subcontract for building works 2000 edition” that it should be submitted by contractor to subcontractor. In respondents recommendation option following suggestions are made

- It should be mutually agreed between the parties
- It depends upon contract between parties

Q15: *The right to suspend the works can be given to the contractor*?

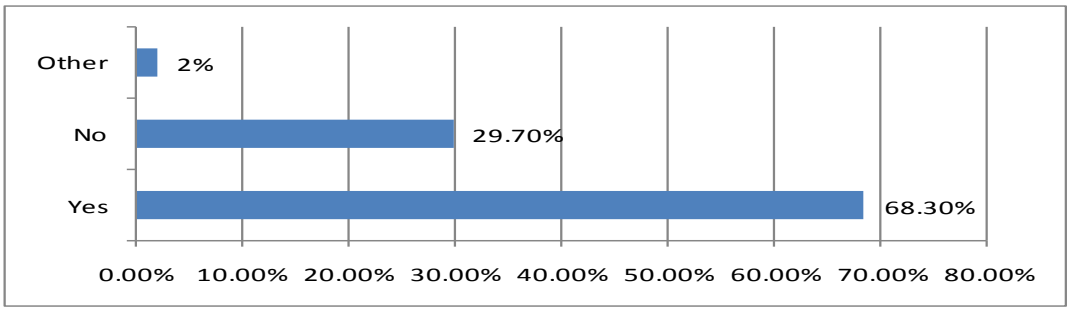

Figure 4.26: Response to question number 15 of third survey

The 68.30% respondents agree with the provision stated in “The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011” while 29.70% disagree with it. According to two respondents it depends upon mutual agreement between the parties

Q16: *The notice given by subcontractor should be responded by the contractor within how many days*?

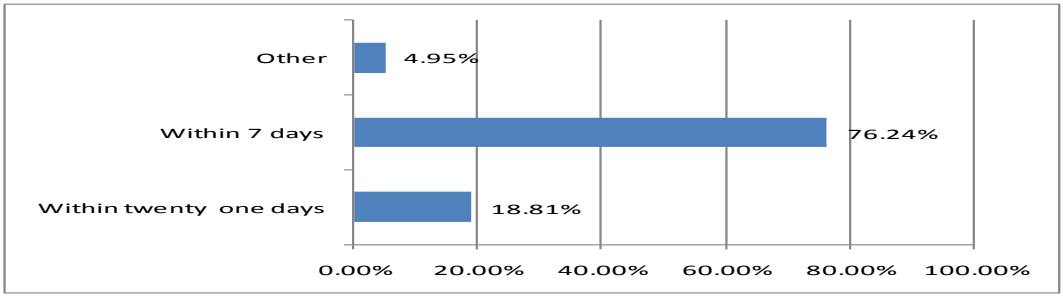

Figure 4.27: Response to question number 16 of third survey

According to 76.24% respondents it should be given within seven days. This is based on general practice in the construction industry to which most of the respondents agreed. Only 18.81% respondents agreed with ", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011". In respondents recommendation option following suggestions are made

- As mentioned in subcontract,
- Depending upon special conditions of contract
- Depends upon nature of notice
- Two respondents say that is should be done within 14 days

Q17: *Should progress report be submitted by subcontractor*?

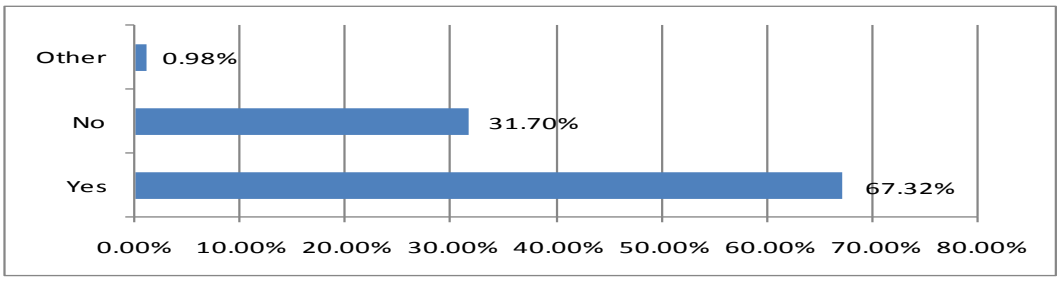

Figure 4.28: Response to question number 17 of third survey

The 67.32% respondents agree with the provision stated by "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" that progress reports should be submitted by the subcontractor while 31.70% do not agree with this. In respondents recommendation option a user stated that it depends upon mutual agreement between the parties.

Q18: *Should subcontractor be involved in the measurement of quantities of works*?

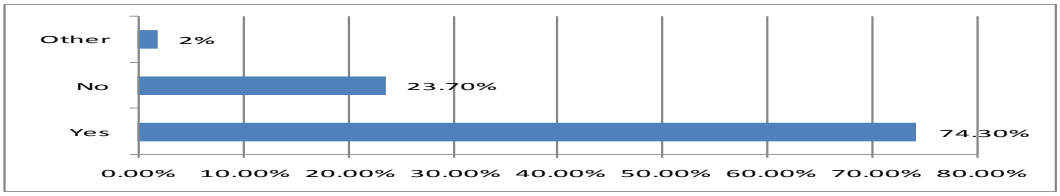

Figure 4.29 Response to question number 18 of third survey

The 74.30% respondents agree with the provision stated by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" while 23.70% disagree with this. Following suggestions are made in respondent's recommendation option

- It depends upon client's approval
- It depends upon contract terms

Q19: *In case of non agreement on measurement of quantities of work should the contractor have the right to make a fair decision*?

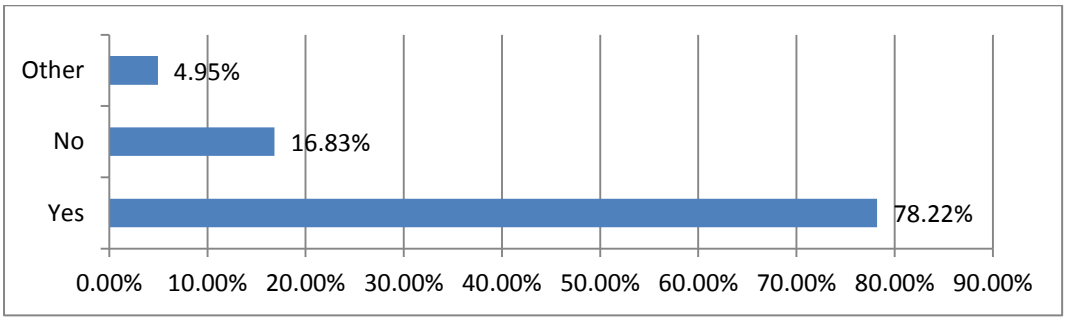

Figure 4.30: Response to question number 19 of third survey

The 78.22% respondents agree with the right given to the contractor to make a fair decision in case there is some conflict on measurement of quantities. This is a provision given by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011". The 16.83% respondent disagree with it while 4.95% have given their own suggestions that are as follows

- Four respondents state that a neutral third party should decide this
- Dispute resolution clause must cover this issue

Q20: *Should the contractor have the right to give instructions to accelerate the work?*

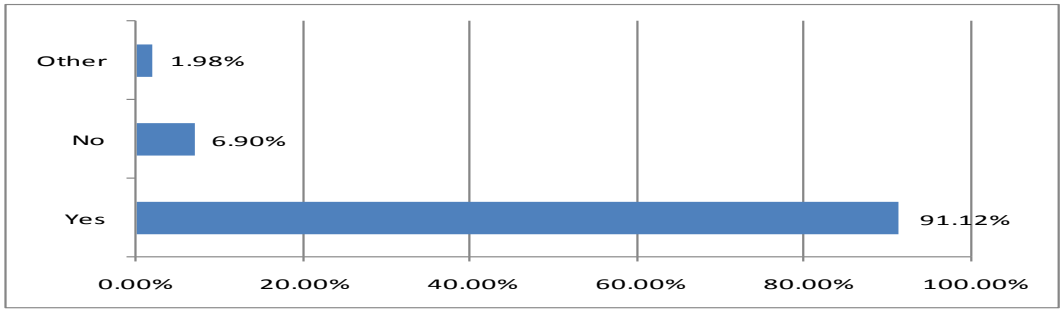

Figure 4.31: Response to question number 20 of third survey

The 91.12% of the respondents agree with the right given to accelerate the work by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and "Conditions of Subcontract by Construction Industry Development Board Malaysia" while 6.90% disagree with it. The suggestions made in respondent's recommendation option are as follows

- By written notice contractor can give instructions to accelerate the work
- Contractor can only give such instruction if in turn they offer certain bonuses to subcontractor

Q21: *Variations should only be acted if given by*

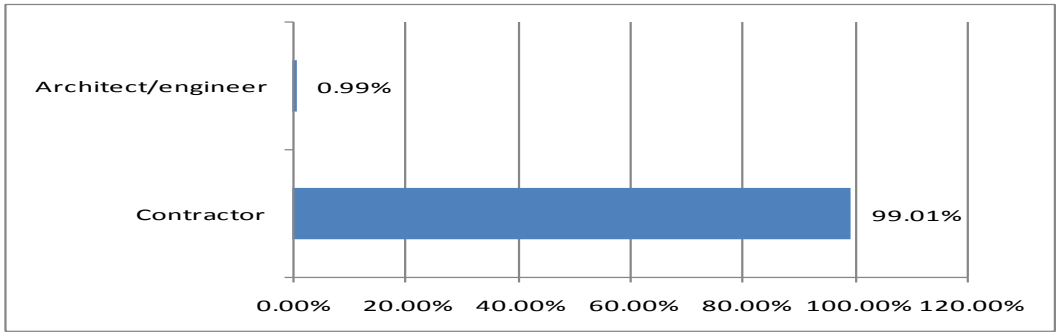

Figure 4.32: Response to question number 21 of third survey

The 99.01 respondents maintained the provision in ", FIDIC conditions of subcontract for works of civil engineering construction, 1994", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" and "The Government of Hong Kong special administration region subcontract for building works 2000 edition" regarding variations. Only one respondent was of the view that Architect/Engineer decision should be followed.

Q22: *Payments can be withheld by the contractor in which situations*?

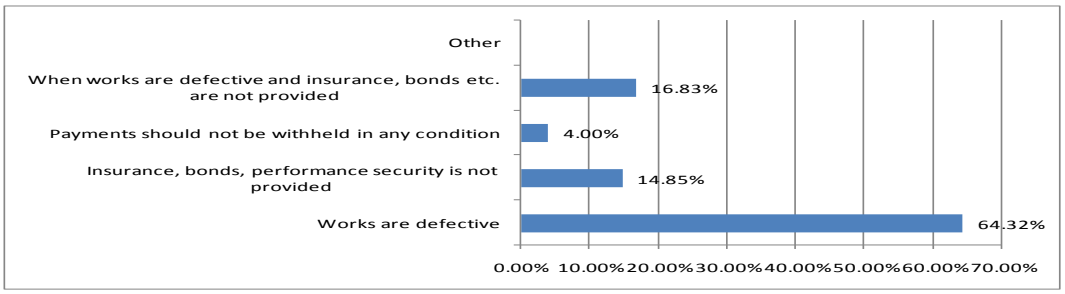

Figure 4.33: Response to question number 22 of third survey

64.32% respondents supported the first condition of "Associated General Contractors of California long form standard subcontract" that payments can be held if the works are defective. However only 14.85% agreed with the second portion of the clause that payments can be withheld if insurance, bonds and performance securities are not provided. Those in full agreement with the clause

mentioned in the above mentioned general conditions of subcontract. Those in favor of the suggestion that payments cannot be withheld in any situation are 4% of the respondents.

Q23: *When should the payment be given to the subcontractor*?

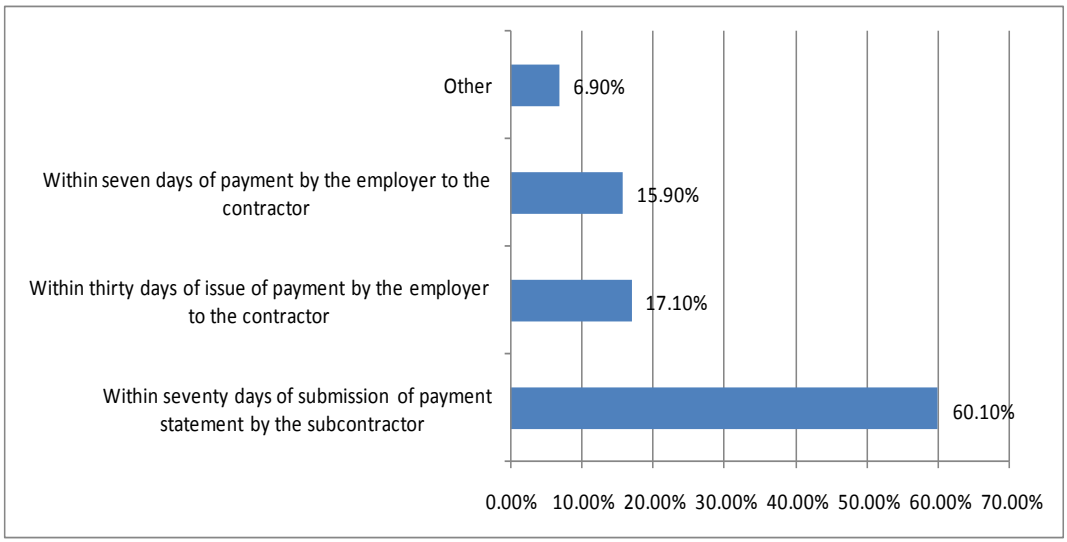

Figure 4.34: Response to question number 23 of third survey

60.10% respondents agree with the condition mentioned in "FIDIC conditions of subcontract for works of civil engineering construction, 1994" and"The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", 17.10% agree with "Conditions of Subcontract by Construction Industry Development Board Malaysia", 15.90% agree with American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" and "The Government of Hong Kong special administration region subcontract for building works 2000 edition" and "Associated General Contractors of California long form standard subcontract". In respondents recommendation option following suggestions are made

- According to four respondents it should be paid within the duration agreed in contract terms

- Within twenty eight days subcontractor should be paid
- Within thirty days contractor should be paid
- It depends upon the work progress of the subcontractor

Q24: *When should the final payment be given to the subcontractor*?

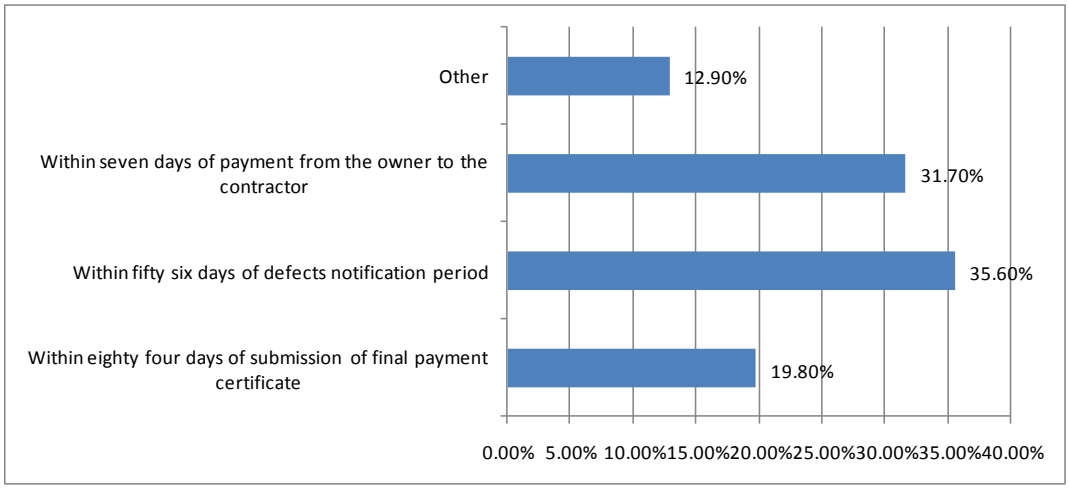

Figure 4.35: Response to question number 24 of third survey

In this question no clear answer is obtained. According to 35.60% final payment should be made within fifty six days of defects notification period. This is stated in a clause in The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011". 31.70% respondents agreed with "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" that within seven days of payment from the owner to the contractor, subcontractor should be paid. The final payment to be made within eighty four days of submission of final payment certificate has been agreed by 19.80%. This is stated in a clause in "FIDIC conditions of subcontract for works of civil engineering construction, 1994". In respondent's recommendation option following suggestions are made

- According to 6 respondents it should be made as per the terms and conditions of contract

- It depends on the liability period. For-example if water proofing work is carried out contractor should retain payment for as much time as agreed (min 3-4 months)
- Within thirty days,
- When final bill of the contractor is cleared from the client
- According to two respondents it should be made within one month of payment from owner
- After client's representative provides clearance certificate
- After completion of defects liability period, within one month

Q25: *Should subcontractor be given an explanatory notice if payment is delayed*?

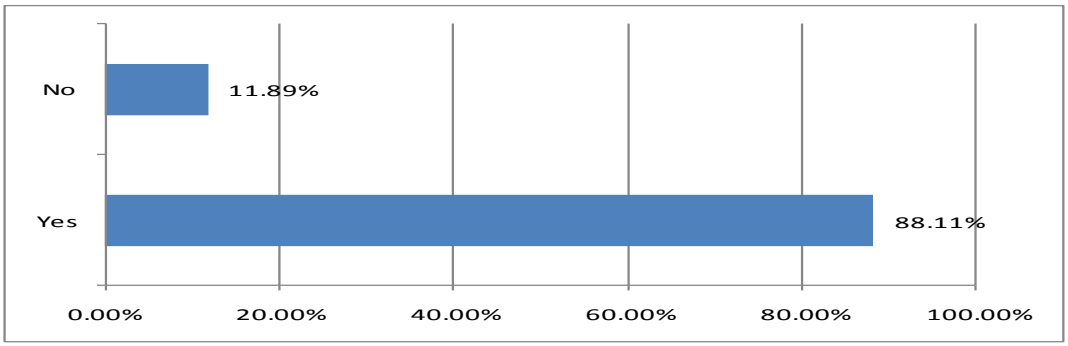

Figure 4.36: Response to question number 25 of third survey

88.11% respondents agreed with the condition mentioned in FIDIC conditions of subcontract for works of civil engineering construction, 1994" that an explanation should be given in form a notice to the subcontractor if payments are delayed due to unavoidable reasons. The rest of 11.89% disagreed with this.

Q26: *When should the performance security, if submitted by the subcontractor may be returned?*

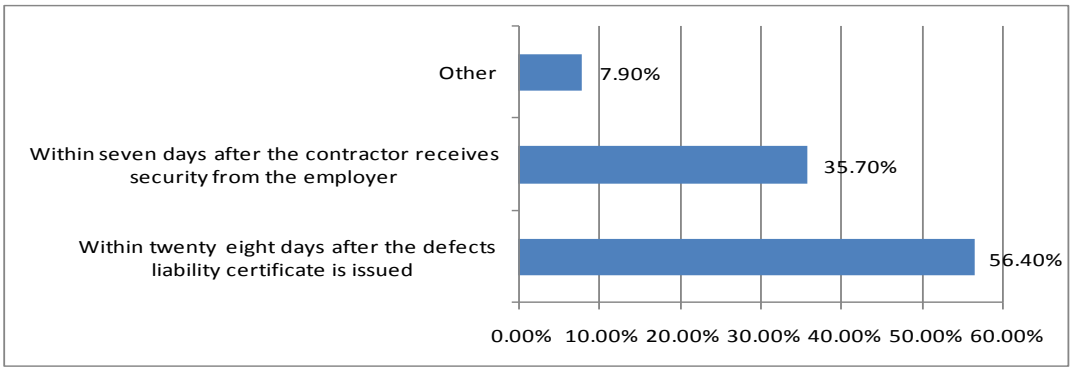

Figure 4.37: Response to question number 26 of third survey

According to 56.40% respondents performance security should be returned within twenty eight days after the defects liability certificate is issued. This is mentioned in a clause in "FIDIC conditions of subcontract for works of civil engineering construction, 1994". 35.70% agreed with "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" that it should be paid within seven days after the contractor receives security from the employer. In respondents recommendation option following suggestions are made

- Performance security should not be submitted by the subcontractor,
- After rectification of work is completed
- Completion of defects liability period
- According to five respondents it should be return upon expiry of maintenance period
- It depends upon department in charge of the project

Q27: *The subcontract can be terminated by the contractor in which conditions*?

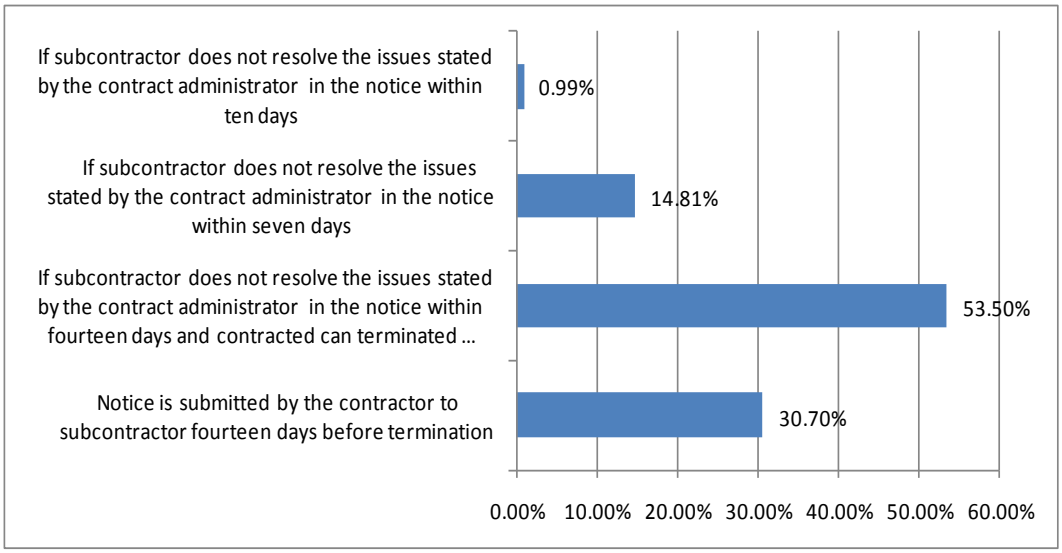

Figure 4.38: Response to question number 27 of third survey

53.50% respondents are of the opinion that subcontract can be terminated provided subcontractor does not resolve the issue stated by contract administrator in notice within fourteen days and subcontract can be terminated after 7 days have been lapsed. This is a condition mentioned in "Conditions of Subcontract by Construction Industry Development Board Malaysia". Subcontract can be terminated by giving a notice prior to fourteen days of termination, a clause mentioned in "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"is agreed by 30.70% respondents. 14.81% agree with "The Government of Hong Kong special administration region subcontract for building works 2000 edition" that subcontract can be terminated provided subcontractor does not resolve the issue mentioned in notice within seven days. Only one respondent has agreed with "Associated General Contractors of California long form standard subcontract" that if the subcontractor does not resolve the issue mentioned in the notice within ten days, subcontract will be terminated.

Q28: *Insurance should be carried out by whom*?

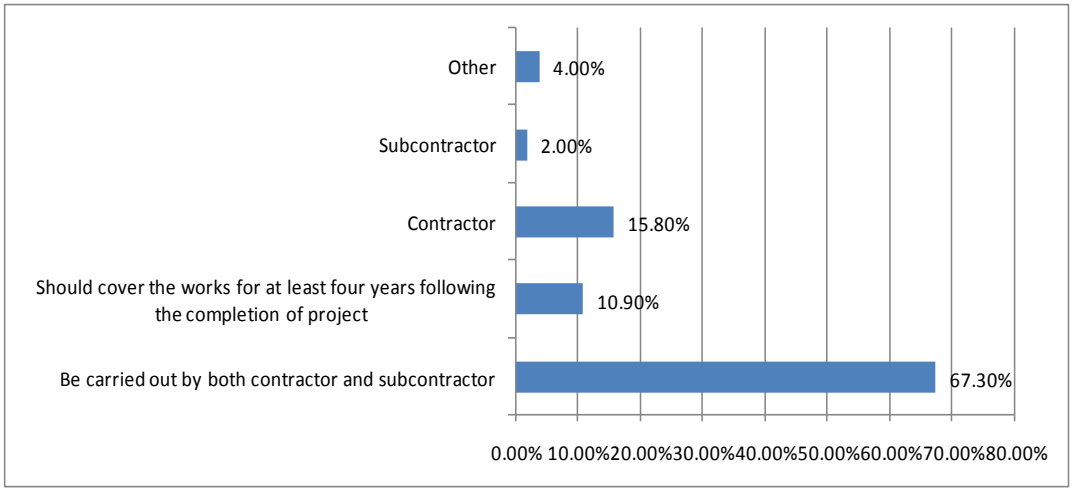

Figure 4.39: Response to question number 28 of third survey

According to 67.30% respondents insurance should be carried out by both contractor and subcontractor. This is in agreement with ", FIDIC conditions of subcontract for works of civil engineering construction, 1994", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", "Conditions of Subcontract by Construction Industry Development Board Malaysia". 15.80% stated that insurance should be carried out by contractor. Only 2% maintained the statement of "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" and "Associated General Contractors of California long form standard subcontract". Another statement is given by "Associated General Contractors of California long form standard subcontract" that insurance of subcontracted works should cover four years following completion of project. This has been agreed by 10.90% respondents. In respondents recommendation option following suggestions have been made

- According to four respondents insurance should cover one year following completion of works

Q29: What should be the provision regarding dispute resolution?

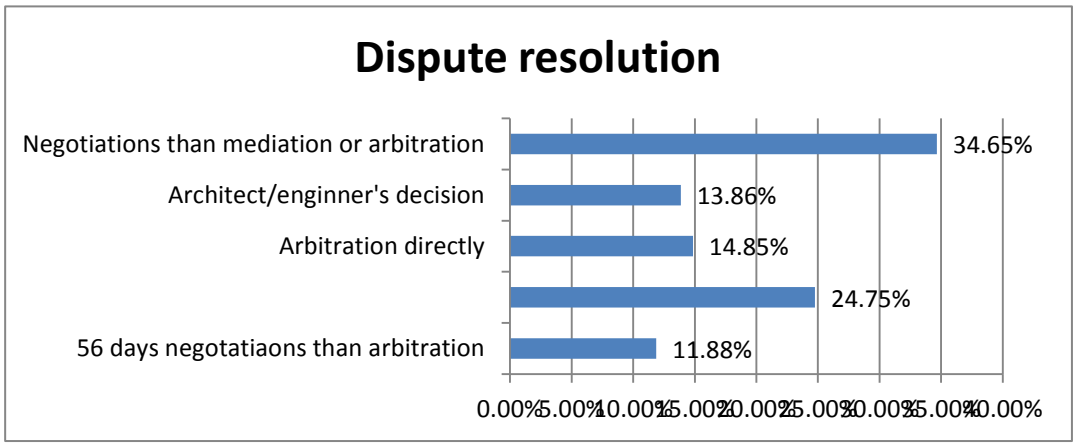

Figure 4.40: Response to question number 29 of third survey

Here in this question too, no definite answer has been obtained. According to 34.65% respondents parties should first try negotiations, if not successful than mediators should be involved. Arbitration is the next step if desired by the parties. This is mentioned in a clause in "Associated General Contractors of California long form standard subcontract". The formation of subcontractor dispute adjudication board as proposed by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" has been agreed by 24.75% respondents. The provision of "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor" has been considered appropriate by 14.85% respondents. The procedure of directing the matter to architect/engineer as proposed by and "The Government of Hong Kong special administration region subcontract for building works 2000 edition" has been selected by 13.86% respondents. If no resolution is not reached within fifty five days of attempt of mutual resolution matter should be passed on to arbitration, as proposed by " FIDIC conditions of subcontract for works of civil engineering construction, 1994" has been agreed by 11.88% respondents.

4.5 SEMI STRUCTURED INTERVIEWS

Following the results of the second survey semi structured interviews were conducted with legal experts. The aim was to determine the legal viability of the suggestions made on the basis of results of the survey. It was deemed necessary to check that if the suggestions favor any particular party and are there any provisions which are unfair to some particular party. The suggestions in printed form were presented to the party to carry out detailed discussions on them. In the beginning the parties which were a part of various provisions were explained. Afterwards the summary of the clauses which were selected in the survey were written that were presented to the respondents. Detailed in depth semi structured interviews were carried out with 15^{th} legal experts. This lead to conceptual saturation which is a point where further collection and analysis of qualitative data does not generate any new data (Globe et al., 2009).

The experts were first asked that are they familiar with construction industry ant the parties associated with it. All legal experts stated that the relationship between the general contractor and subcontractor relationship in the construction industry. Out of 15 legal experts 3 had been involved in drafting of construction contracts, 2 had experience in dealing with construction claims. This shows that 5/15 experts had been involved in the construction contracts in the past. They were asked to give their feedback regarding the suggestions made in the document presented to them. The legal experts were requested to review all the suggestions made and recommend any new provision that according to them should be a part of general conditions of subcontract. The recommendations given by a legal expert in the interview was carried forward to the next in order to check its legal viability with others as well. In addition to the opinion on the suggestions given in printed form the experts were also asked to give their feedback regarding two questions in which no clear answer was obtained from the earlier survey conducted with construction professionals. Various suggestions of legal nature that were not part of survey were also discussed with the legal experts and their recommendations were taken. These questions included

- Feedback regarding the time frame of the final payment to the subcontractor
- Dispute resolution procedures

Minor changes to the language of the suggestions were also made by the legal experts.

The profile of the experts is shown in Figure 4.41

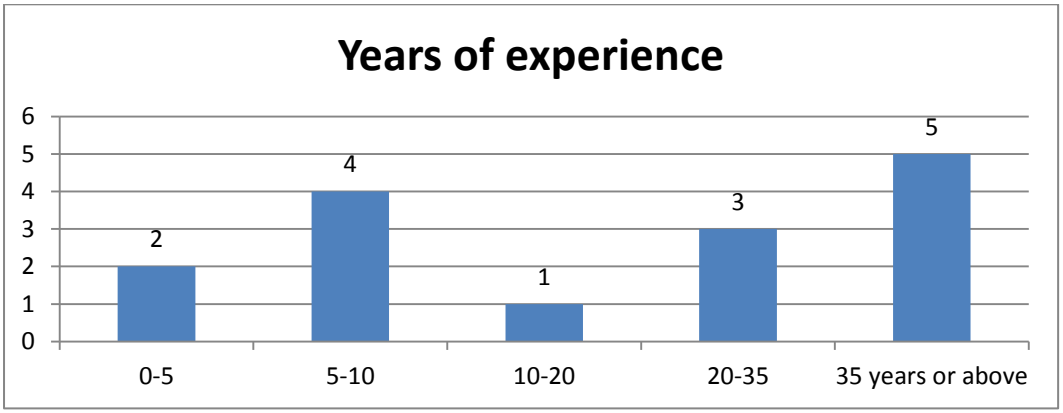

Figure 4.41: Years of experience of legal experts

As it can be seen in Figure 4.41 there are 5 legal experts that have more than 35 years of experience and 3 have between 20-35 years of experience. Only 1 have 10-20 years of experience, 4 have 5-10 and 2 have 0-5 years of experience. The Fig 4.41 shows that the experts had sufficient experience to respond to the questions in the interview.

Out of 15 eleven experts stated that the conditions are balanced for both parties and there is as such no problem when it comes to fair allocation of risk to the parties. The rest of four stated that it can be balanced after incorporating suggestions made by them. The experts told that these conditions do not violate the contract law of Pakistan which is the main source regulating the contracts in the country.

4.5.1 Recommendations given by the Legal experts

The general responsibilities of both contractor and subcontractor suggested by all contracts studied in the literature review were discussed with the legal

experts. Based upon which recommendations were finalized. Various clauses that had legal nature like extensions of time, errors in drawings and specifications etc. which were not a part of previous survey were also a part of semi structured interviews. All experts suggested that the provision that gives the right to give fair decision in case there is a disagreement on measurement of quantities as proposed by FIDIC in 2011 should not be a part of general conditions of subcontract. Similarly the deputation of contract administrator was not favored by the legal experts. The legal experts stated that "No one should be judge in his own cause". Hence this condition has been abolished from the suggestions drafted for the subcontract. 13 out of 15 experts were of the opinion that in case performance security is not provided by the subcontractor than his payment should be withheld till the time it is submitted. This suggestion given by legal experts is in line with the conditions proposed by FIDIC in 1994 and 2011. However this was ruled out by the construction professionals in the survey conducted earlier on. However the legal experts believed that this condition is not possible from the legal point of view. Therefore this suggestion was incorporated in the suggestions for subcontract. A suggestion was made in the survey done with the construction professionals that the sub sub contracting should be done with the consent of the main contractor. It was suggested by the legal experts that this consent should be temporary. The main contractor should have the right to verify the credentials of the sub sub contractor.

As per the previous survey it was suggested that subcontractor should submit schedule of activities to the contractor. A legal expert suggested that a time frame of thirty days should be given to the subcontractor to submit the work schedule. However in later discussion with other experts it was kept fourteen days after letter of acceptance as proposed by FIDIC. In accordance with the survey conducted with construction professionals a suggestion was made that extensions of time should be provided to the subcontractor for events that are beyond their control and for which they are not responsible. The legal experts were of the opinion that special emphasis should be given to the Acts of God for which compensation should be provided. A suggestion was made in the survey that the contractor should submit a notice to the subcontractor in case the payment is

delayed and it should explain the reason behind it. The legal experts suggested that a time frame for this notice should be provided. Seven experts suggested that notice should be given within seven days. This suggestion was incorporated in the framework developed for the subcontractor.

A provision was found in all the subcontracts studied in the literature review that subcontractor should give access to employer, architect/engineer and the main contractor to access the site and the factories etc. where manufacturing of subcontracted works is carried out. An addition to this suggestion was recommended by the legal experts that the employer, architect/engineer and contractor shall not be allowed to contact with the workers until or unless prior approval is obtained from the subcontractor. The right to accelerate the work has been given to the contractor by the construction professionals in the survey. The legal experts stated that it should be given in the case when the contractor is not satisfied with the pace of work of the subcontractor. It was suggested by the legal experts that the indemnification clause where the parties are recommended to cover each other in case of no fault, this suggestion should be a part of Alternate dispute resolution clause. A neutral party should decide that either party is at no fault. In that case indemnification can be done.

The legal experts suggested that in order to ensure that subcontractor is not responsible for events in which an extension should be provided or to decide that weather the subcontracted works are defective or not, this power should be given to some neutral party preferable the architect/engineer. This suggestion was incorporated in the recommendations for the development of framework for the subcontractors.

In the suggestion regarding the submission of progress reports it was recommended by the legal experts that it should be decided by the parties mutually that when they should be submitted i.e. either weekly or monthly. Similarly the progress report should indicate the progress on bar charts and a written description should also be made. The legal experts are of the opinion that variations should only be acted upon by the subcontractor if instructions are given to them in writing. This is in line with the suggestions made in the prior survey with the construction professionals. However legal experts added a new dimension to it. According to

them variation orders should be given in a reasonable time such that changes to work can be made. It should not be such that the works are executed and it is not possible to make changes to the works.

A suggestion was made by an expert that in case of conflict between the main contract and subcontract, the main contract shall prevail . According to him the subcontract is always subject to main contract If there is any deviation between main and subcontractor the main contract is always followed. However this suggestion was refuted by other experts who believed that after terms and conditions of subcontract are finalized with the subcontractor they should be followed.

It was suggested by the experts that final payment should be made upon rectification of defects during maintenance period. It was suggested by the prior survey that in case of non payments the subcontractor can suspend the works by giving a notice 21 days prior to suspension. A legal expert stated that this time frame is too long. However other legal experts refuted this suggestion and stated that it was an adequate time limit. Hence this suggestion was not incorporated. It was suggested in the survey that payments of the subcontractor can be withheld if the works executed by them are defective. The legal experts are of the opinion that the authority to decide the status of the works should be given to the Architect/Engineer. Regarding the suspension of works by the subcontractor the legal experts were of the opinion that the time period of 21 days for notice after which the works can be suspended is too long. It was recommended that this period may be reduced to fifteen days. It was suggested that contractor can give the instructions to accelerate the work. This has been maintained by the legal experts with the addition that architect/engineer will access the pace of work first. If it is far behind schedule and there is no fault of subcontractor in these delays subcontractor may be instructed to accelerate the work and additional costs will be given to them.

There were two provisions which were unable to be concluded by the survey conducted with the professionals of the construction industry. The course of action regarding the final payments and dispute resolution was unable to be concluded. Hence this question was taken forward to the legal experts. Regarding

final payments 11 out of 15 legal experts stated that it should be made within fifty six days of defects notification period which is in line with "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011". Only 4 were in the favor of the suggestion that it should be made within seven days of payment from the owner. In case of dispute resolution majority of the legal experts i.e. 13 out 15 were in the favor of suggestion which states that negotiations should be carried out first which if fails than a neutral third party can be involved. Even if this does not work out than parties can proceed with arbitration whose decision will be binding upon the parties. Only 2 experts were in the favor of formation of Subcontractor Dispute Adjudication Board proposed by FIDIC in 2011. The experts did not consider it to be a feasible alternative.

4.5.2 Final suggestions

1. Definitions

Employer: A person (or organization, company or institute) that employs the architect/engineer and the contractor for execution of works

Architect /Engineer: A person (organization, company or institute) who is qualified to and is assigned the task by the employer to certify the works executed by the contractor

Contractor: A person (agency or company) who executes the works as indicated by the contract between them and the employer

Subcontractor: A person or agency who is appointed by the contractor for the execution of works

Main contract: The contract between the main contractor and the employer specifying details of work, methods, manners and other features of the sequence of execution of work and tasks

Subcontract: The contract between the contractor and a subcontractor

2. **General Obligations of the Contractor**

- To provide access to the site to the subcontractor
- To ensure that all the information is given to the subcontractor in a timely manner so that works are completed in time
- To pay the subcontractor according to the terms and conditions of this contract

3. **General Obligations of Subcontractor**
    - To complete the works not later than the date of completion mentioned in the contract
    - The Subcontractor shall provide all labour, materials, Constructional Plant and machinery necessary for executing the subcontract
    - To abide by all the provisions mentioned in the contract
    - Subcontractor should immediately inform the contractor in case of errors or omissions in drawings and specifications and other contract documents

    Model Clause: Clause 1 of "Conditions of Subcontract by Construction Industry Development Board Malaysia" and Clause 2.1 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994"

4. **Entering into the subcontract**

    The Sub-contractor when called upon to do so by the Contractor, shall enter into and execute the Sub-contract

    Model Clause: Clause 3 of "The Government of Hong Kong special administration region subcontract for building works 2000 edition

5. **Position of Subcontract**

    If any conflict appears between the provisions of the Main Contract in so far as they relate and apply to the Sub-contract Works and any documents forming part of the Sub-contract, the provisions of the Subcontract as so described shall prevail.

    Model clause: Modification to Clause 4(1) of "The Government of Hong Kong special administration region subcontract for building works 2000

edition". The subcontract is given precedence.

6. **Access to Main contract**

   If requested by the subcontractor, a copy of main contract may be provided to the subcontractor except its price part.

   Model Clause: Clause 2.1 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and Clause 5(2) of "The Government of Hong Kong special administration region subcontract for building works 2000 edition"

7. **Representative on Site**

   Both parties i.e. the contractor and the subcontractor should depute their representative on site for which they had agreed for. Contractor's subcontract representative particulars should be provided to the subcontractor. It should be ensured by the subcontractor that his representative receives instructions on his behalf and gives his full time to the direction of works.

   Model Clause: Clause 6.3 and 6.4 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

8. **Beginning of works**

   The Sub-contractor shall commence the Sub-contract Works on the date mutually agreed at the time of contract duly signed by the both parties.

   Model Clause: This suggestion has been generated during the survey which was validated by the legal experts.

9. **Errors in contract documents**

   The subcontractor should promptly inform the contractor in case any error or omission is found in drawings and specifications and other contract documents.

   Model Clause: Clause 2.1 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994"

10. **Health and safety**

    Both the contractor and subcontractor should keep their area of site clean

and comply with health and safety regulations. Both parties are responsible for health and safety of their workers.

Model Clause: Clause 5.3 of "Conditions of Subcontract by Construction Industry Development Board Malaysia"

11. **Performance security**

    i. Performance security should be provided to the contractor within twenty-eight days of letter of acceptance. Payments shall be withheld in case the security is not provided.

Model Clause: Clause 4.2 and Clause 14.6 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

    ii. The performance security should be returned to the subcontractor within twenty eight days after defects liability certificate is issued.

Model Clause: Clause 2.2 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994

12. **Sub Sub Contracting**

The Sub-contractor shall not sub-contract the Sub-contracted Works or any part of the same without the written consent of the Contractor. This consent will be temporary and will be subject to the verification of the credentials of the sub sub contractor by the main contractor.

Model clause: Article 7 of American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor, Clause 2.5 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994", Clause 5.1 of ", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011". An addition to the clause is however recommended. The approval of sub sub contracting has been made temporary. It is subject to verification of credentials of the sub sub contractor by the contractor.

13. **Abiding by the instructions**

The Sub-contractor shall comply with all instructions given to him by the Contractor and with decisions, instructions and orders given to the

Contractor by the Architect or the Architect's Representative which are confirmed in writing to him by the Contractor.

Model Clause: Clause 8.2 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994", Clause 2.3 and 3.1 of The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", Clause 2.2 of " and "Conditions of Subcontract by Construction Industry Development Board Malaysia"

14. **Satisfaction of works**

The Sub-contractor shall execute the Sub-contracted Works in strict accordance with the Sub-contract to the satisfaction of the Contractor and the Architect.

Model Clause: Clause 10 of "The Government of Hong Kong special administration region subcontract for building works 2000 edition".

15. **Works Schedule**

Subcontractor should submit to the Contractor for his consent a programme (work schedule), in such form and detail as the Contractor shall reasonably prescribe, for the execution of the Subcontract Works. This work schedule should be provided within fourteen days of letter of acceptance.

Model Clause: Section 5 of "Associated General Contractors of California long form standard subcontract" Clause 2.3 of FIDIC conditions of subcontract for works of civil engineering construction, 1994" and Clause 8.3 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011.

16. **Progress reports**

Progress reports on weekly or monthly basis, in the form of charts or written reports as agreed by the parties should be submitted to the contractor by the subcontractor.

Model Clause: According to FIDIC in 2011(Clause 8.5) it depends upon the requirement of the contractor. However based upon survey and interviews it has been modified that weekly or monthly progress report

should be submitted. It may be in the form of charts or written report.

17. **Acceleration of work**

    The contractor is given the right to instruct the subcontractor to accelerate the pace of work if the architect/engineer determines that the acceleration of work is necessary. In this case the contractor can give the instructions to the subcontractor to accelerate the work. If there is no fault of the subcontractor in these delays subcontractor may be instructed to accelerate the work for which they will be paid for additional work.

    Model Clause: Clause 3.6 of "Conditions of Subcontract by Construction Industry Development Board Malaysia" and a provision in FIDIC 2011 has been modified with the addition of determination of requirement of acceleration by the architect/engineer.

18. **Notices to the contractor**

    The notices submitted to the contractor by the subcontractor regarding the events that might cause delay or may become the cause of an additional payment etc. and other issues should be responded within seven days

    Model Clause: Based upon suggestions during survey and semi structured interviews

19. **Indemnification**

    Both parties i.e. contractor and subcontractor should indemnify each other for the events in which the either party is not responsible. Contractor should indemnify subcontractor from the events that occur due to fault in design, errors in documents, bodily injury, deaths which cannot be attributable to the subcontractor. Subcontractor should indemnify the contractor in case of events in which subcontractor or its representatives are responsible which may include acts or omissions, claims, damages or loss etc. In case contractor and subcontractor are unable to decide the responsible party, then refer to dispute resolution clause.

    Model Clause: Clause 17.1, 17.2 of "The Red Book Subcontract-- Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011", Clause 6(1) of "The Government of Hong Kong special administration region subcontract for

building works 2000 edition", Clause 13.1 and 13.2

of " FIDIC conditions of subcontract for works of civil engineering construction, 1994",Section 14 of "Associated General Contractors of California long form standard subcontract", Fourth article of "American Institute of Architects A401-2007 Standard Agreement between the Contractor and Subcontractor". Modification has been suggested that if parties are unable to decide the responsible party matter should be dealt according to dispute resolution methods.

20. **Extensions of time**

Extensions of time should be provided to the subcontractor in case of events beyond their control and for which they are not responsible including the situations that involve Acts of God. However the subcontractor needs to submit a notice within fourteen days of occurrence of these events to the contractor.

Model Clause: Clause 7.1 and 7.2 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994" with a modification that Acts of God have been especially mentioned in it.

21. **Compensation for delays**

If the subcontractor does not complete the works within specified time mentioned in the contract, the subcontractor has to pay liquidated damages to the contractor. The amount of these damages may be pre specified in the appendix to subcontractor's offer.

Model Clause: Clause 3.9 of "Conditions of Subcontract by Construction Industry Development Board Malaysia" with the modification that instead of contract administrator accessing the loss to the contractor the amount is pre specified in subcontractor's offer.

22. **Variations**

Variations to the work can only be acted upon if given by the Contractor in writing to the subcontractor within a reasonable time in which change to the works is possible. They will be valued based upon similar works in the contract documents. If such works are not present in the contract documents than such determination shall me made as fair as possible.

Model Clause: Clause 9.1, 9,2 of ", FIDIC conditions of subcontract for works of civil engineering construction, 1994", Clause 13.1 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" with a modification that contractor has been instructed to order the variations in a reasonable time in which such changes are possible.

23. **Responsibility of works**

Subcontractor has to maintain the subcontracted works completed before the issue of taking over certificate by the contractor. After the certificate is issued, subcontractor shall be liable to repair the defects in the works till the time of expiry of defects liability.For damages/ defects in the work not caused by the subcontractor the subcontractor shall be paid for repairs

Model Clause: Clause 14.1, 14.2 and 14.3 of ", FIDIC conditions of subcontract for works of civil engineering construction, 1994", Clause 17.1 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

24. **Payments to the subcontractor**

i. The statement for payment (request for payment) should be submitted by the subcontractor to the contractor at least seven days before the date the contractor has to submit it to the engineer

Model Clause: Clause 16.1 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994" and Clause 14.4 of ", "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

ii. In case of delay in payments by the Employer a written notice explaining the reasons of delay should be given to the subcontractor within seven days of due date of payment.

Model Clause: Clause 16.3 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994" with an addition that notice should be given within seven days of due date of payment.

iii. Payments should be given to the subcontractor within seventy days

of submission of payment certificate to the contractor. In case of further delay the contractor will pay financing charges to the subcontractor

Model Clause: Clause 16.2 of ", FIDIC conditions of subcontract for works of civil engineering construction, 1994" and Clause 14.6 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011".

iv. The representative of the subcontractor should be involved in the measurement of quantities for payment of works.

Model Clause: Clause 12.1 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

v. Payments of subcontractor can be held if the works executed by them is defective. The authority to declare the works as defective is given to the Architect/Engineer

Model Clause: Section 4 of "Associated General Contractors of California long form standard subcontract",

vi. The final payment should be given to the subcontractor within fifty six days of expiry of defects notification period. Else contractor will pay the subcontractor the financing charges. Retention money should be paid within thirty-five days of handing taking over. Rest should be paid within seven days of release of final payment

Model Clause: Clause 14.8 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011".

25. **Access to site by the subcontractor**

The subcontractor has to provide access to the architect/engineer, contractor and its employees to the construction site and to the workshops, factories and places where the materials are being manufactured but no one is allowed to anyone to directly contact the workers until or unless a prior approval has been granted by the subcontractor.

Model Clause: Clause 6.3 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994" and Clause 4.3 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

26. **Suspension of works**

    If the Contractor wants to suspend the subcontracted works, the reasons for the suspension should be provided to the subcontractor. However subcontractor cannot suspend the works on his own.

    Model Clause: Clause 8.6 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011".

    In case of non payments within the due date the subcontractor can suspend the works by giving a notice at fifteen days prior to suspension.

    Model Clause: Clause 16.1 by "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" has been modified by changing the minimum time limit prescribed for suspension notice from 21 to 15 days.

27. **Termination of Subcontract due to Subcontractor's default**

    If the Subcontractor does not proceed with the work in a regular and timely manner; or persistently does not comply with the contractor instructions, the Contractor may give a written notice to the Subcontractor. If the Subcontractor does not rectify the breach within 14 days from the date of receipt of notice, the Contractor may then terminate, in writing, the Subcontractor's employment under this contract within 7 days following the end of the 14 day notice period.

    Model Clause: Clause 6.2 of Conditions of Subcontract by Construction Industry Development Board Malaysia"

28. **Termination of subcontract due to no fault of the subcontractor**

    In case the subcontract is terminated due to no fault of the subcontractor, the subcontractor will be paid for the financial damages and expenses incurred by them.

Model Clause: Clause 6.5 of Conditions of Subcontract by Construction Industry Development Board Malaysia",

29. **Insurance**

    During the course of contract the contractor and subcontractor should ensure the insurance of their works at their own expense.

    Model Clause: Clause 15 of ", FIDIC conditions of subcontract for works of civil engineering construction, 1994", Clause 18 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011" and Clause 1 of "Conditions of Subcontract by Construction Industry Development Board Malaysia".

30. **Termination of Main contract**

    If the Main Contract is terminated whether by the Contractor or by the Employer, then without prejudice to the accrued rights or remedies of either party the Sub-contract shall thereupon also be terminated and proper compensation for the works executed by him so far will be provided by the main contractor.

    Model Clause: Clause 6.4 and 6.5 of Conditions of Subcontract by Construction Industry Development Board Malaysia", Clause 17 of "FIDIC conditions of subcontract for works of civil engineering construction, 1994" and Clause 15.1 of "The Red Book Subcontract--Conditions of Subcontract for Construction for Building and Engineering Works, Designed by the Employer, First Edition 2011"

31. **Dispute resolution**

    In case of disputes parties should carry out negotiations which if not successful then try involving a neutral third party. Matter can be directed to arbitration if desired by the parties. The decision of the arbitrator will be binding upon the parties**.**

    Model Clause: Section 17 of Associated General Contractors of California long form standard subcontract

4.6 SOLUTION TO RISKS IN PAKISTAN

The solutions to various risks identified in the local industry in the light of recommendations made for the subcontract are as follows (Table 4.9)

Table 4.9: Solution of risks in light of recommendations made

Risk	Solution
Delays in Payments	In case of delay of payments by the Employer a written notice explaining the reasons of delay should be given to the subcontractor within seven days of due date of payment. Payments should be given to the subcontractor within seventy days of submission of payment certificate to the contractor. In case of further delay the contractor will pay financing charges to the subcontractor
Delays in work	Extensions of time should be provided to the subcontractor in case of events beyond their control and for which they are not responsible including the situations that involve Acts of God. If the subcontractor does not complete the works within specified time mentioned in the contract, the subcontractor has to pay liquidated damages to the contractor
Incompetent subcontractor	The contractor/contract administrator may give a written notice to the Subcontractor. If the Subcontractor does not rectify the issues within 14 days from the date the subcontractor receives the notice, the Contractor may then terminate, in writing, the Subcontractor's employment under this contract within 7 days following the end of the 14 day notice period.
Negative attitude of parties	Needs future research
Poor quality of works	The Sub-contractor shall execute the Sub-contract Works in strict accordance with the Sub-contract to the satisfaction of the Contractor/contract administrator and the Architect
Lack of proper supervision	It should be ensured by the subcontractor that his representative received instructions on his behalf and give his full time to the direction of works.
Exaggerated claims by the subcontractor	The representative of the subcontractor should be involved in the measurement of quantities for payment of works
Change orders	Variations to the work can only be acted upon if given by the Contractor/contract administrator in writing to the subcontractor within a

	reasonable time in which change to the works is possible. They will be valued based upon similar works in the contract documents. If such works are not present in the contract documents than such determination shall me made as fair as possible
Estimation errors in bill of quantities	The subcontractor should promptly inform the contractor in case any error or omission is found in drawings and specifications and other contract documents
Either delays or poor quality of contractor provided material	Can be addressed by extensions of time and indemnification suggestions
Lack of communication	Progress reports are to be submitted by the subcontractor. Contractor has to reply to notices within seven days
Absence of general contractor from site	The contractor should depute a representative on site
Errors in drawings and specifications	The subcontractor should promptly inform the contractor in case any error or omission is found in drawings and specifications and other contract documents
Avoiding instructions given by general contractor	The contractor/contract administrator may give a written notice to the Subcontractor. If the Subcontractor does not rectify the issues within 14 days from the date the subcontractor receives the notice, the Contractor may then terminate, in writing, the Subcontractor's employment under this contract within 7 days following the end of the 14 day notice period
Acceleration/suspension of work by general contractor	The contractor/contract administrator is given the right to instruct the subcontractor to accelerate the pace of work if the architect/engineer determines that the acceleration of work is necessary. In this case the contractor can give the instructions to the subcontractor to accelerate the work. If there is no fault of the subcontractor in these delays subcontractor may be instructed to accelerate the work for which they will be paid for additional work

Delay in reply to queries	The notices submitted to the contractor by the subcontractor regarding the events that might cause delay or may become the cause of an additional payment etc. and other issues should be responded within seven days
Extra works	Can be addressed by a suggestion similar to variations
Changed conditions	Can be addressed by a clause similar to variations
Assigning part of subcontracted works to another	Can be addressed by indemnification clause.
Absence of subcontractor from site	Subcontractor has to depute a representative on site

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, conclusions and recommendations are presented. The conclusions have been made based on the results obtained in Chapter 4. A comparison of the causes of disputes indicated in literature and Pakistani construction industry was conducted. Afterwards an analysis was done to determine the ranking of dispute factors based upon risk they pose to general contractor relationship globally. Afterwards suggestions for general conditions of contract between the general contractor and subcontractor were made for the construction industry in Pakistan.

5.2 CONCLUSIONS

- The top 5 factors of disputes in the construction industry are delays in payments. Change orders, poor quality of work, delays in work and contractual anomalies.
- The top 5 factors of disputes in the Pakistani industry are delays in payments, delays in work, poor quality of works, poor contractor selection and change orders
- 4/5 dispute causing factors are common in the literature and Pakistani industry. This shows an agreement on the critical causes of disputes in literature and the local industry.
- Delays in works delays in payments and poor quality of works are among the top five causes of disputes between the general contractor and subcontractor all over the world
- Exaggerated claims by the subcontractor have a high chance of occurrence in South Asia as compared to the rest of the world.
- Both general contractor and subcontractor contribute equally towards the

disputes between them.

- A total of 30 matters have been discussed in the suggestions proposed for the general conditions of subcontract. The view held by the international contracts the in case of conflict the conditions of main contract should prevail has been overturned and the subcontract is given precedence in the matters governing general contractor and subcontractor. It will be unfair to the subcontractor that after signing a subcontract, they are governed by conditions of the main contract.
- Both parties are required to depute their representative on sites so that issues can be addressed by them directly. In case of errors in drawings and specifications the only responsibility of the subcontractor is to inform the contractor immediately. This can lead to reduction in disputes as the contractor cannot argue that information regarding the errors and omissions were not provided to him.
- Health and safety is the responsibility of both contractor and subcontractor.
- On a construction site more than one subcontractor is performing the job. Hence both parties should ensure that the safety of their worker.
- The practice of sub sub contracting should not be discouraged. However the contractor should be given the chance to verify the credentials of the subcontractor.
- In case there are subcontractor caused delays liquidated damages should be imposed on him.
- Payments should be given to the subcontractor within seventy days even if the employer has not paid the contractor during this time period. Subcontractors may suspend or slow down the work progress in case payments are not given to them in time.
- In case of disputes negotiation and mediation are encouraged. However if the matter remains unresolved it should be directed to an arbitrator whose decision will be binding upon both parties.
- Out of 35 suggestions made for the general conditions of subcontract 25 originate from FIDIC out of which 4 have minor amendments. The

remaining 11 recommendations contain suggestions from other subcontracts and based on survey and interviews.

- Nineteen out of twenty disputes shortlisted during the first phase of the research are addressed by the suggestions made for the general conditions of subcontract. Only one out of top ten risks have not been answered in the suggestions. These are the situations on which the international contracts do not have any suggestion.
- Negative attitudes of parties cannot be addressed through any suggestion. It is the behavior of parties towards one another. Future research is required in this respect.

5.4 RECOMMENDATIONS

Following are the recommendations made on the basis of research

- Clients should ensure timely payments to the contractor. Subcontractors are normally paid when contractors are paid by the employer. Timely payment to the subcontractors should be ensured. This will lead to a better relationship among the parties and a smooth flow of project
- Delays in work should be avoided by the subcontractor. Adherence to the work schedule submitted to the contractor should be ensured. In case the work progress lags behind the schedule for a long period than subcontractor should be advised to submit a revised work schedule. The subcontractor should be instructed to follow the revised work schedule.
- PEC should also propose a framework for their selection with more focus on technical aspects of the subcontractor. .
- Chances of production of exaggerated claims by the subcontractor is high in South Asia Subcontractors should avoid this practice in the local industry.
- Change orders are a risk between general contractor and subcontractor in the construction industry. Contractor should try to settle this issue with the consultant before its impact is transferred to their relationship with the subcontractor.
- Lack of communication between the parties has been observed in the

international industry. Parties should communicate with each other more often. This leads to a better co ordination and better quality of the final deliverable.

- "No one should be judge in his own cause". This should be ensured while drafting the general conditions of subcontract in Pakistan based on the recommendations proposed in Chapter 3.
- Health and safety should be given importance by both parties' i.e. general contractor and subcontractor. Each party should ensure well being of their workers.
- Contractor should review the contract documents properly. Any errors or omissions found should be settled down with the consultant. It should not be allowed to become an issue with the subcontractor.
- Both contractor and subcontractor should depute a representative on site with full time responsibility of the site. In this was the contractor will not complain that there is a lack of supervision by the subcontractor. Contractors representative will ensure that all the matters are addressed on site in time

5.5 DIRECTIONS FOR FUTURE RESEARCH

This study highlighted the impact, probability and risks caused by dispute causing factors between the general contractor and subcontractor all over the world. The practice of sub sub contracting is also pretty common. A study based on similar methodology for the sub sub contractors may also be carried out. Similarly suggestions for the general conditions of sub sub contract can be proposed. It was observed that negative attitude of parties cannot be addressed through any suggestion in conditions of contract. A study can be carried out to propose a framework through which attitude between the parties can be improved.

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APPENDICES

APPENDIX –A

FIRST QUESTIONNAIRE

This study is carried out by a graduate student of National University of Sciences and Technology (NUST), Islamabad to determine to determine the causes of disputes, their impact and probability of occurrence. Your response will be very valuable to the study. Please take 5 minutes out of your precious time and fill this form. In case of any query contact umerr89@hotmail.com

Name: _____ (optional)

- ○ Educational background
- ○ Undergraduate degree
- ○ Masters Degree
- ○ PhD
- ○ Diploma
- ○ Technical degree
- ○ Non technical degree

Other _____

Type of organization you are working with

- ○ Client
- ○ Consultant
- ○ Contractor
- ○ Subcontractor
- ○ Supplier/Fabricator

Other_____

Years of experience

- ○ 0-5
- ○ 5-10
- ○ 10-20

- ○ 20 years or above

Country of origin: _____

Following are the various causes of disputes between the general contractor and subcontractor. Rate these factors depending upon their impact if they occur between the general contractor and subcontractor and their probability of occurrence
0= no impact and no chance of occurrence
5= very high impact and very high chance of occurrence

1. **Delays in payments**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

2. **Change orders**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

3. **Poor quality of work**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

4. **Errors in drawings and specifications**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

5. **Lack of communication**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

6. **Delays in work**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

7. **Changed conditions**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

8. **Delay in reply to queries**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

9. **Extension of time**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

10. **Acceleration/suspension of work by the general contractor**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

11. **Estimation errors**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

12. **Poor contractor selection**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

13. **Negative attitude of parties**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

14. **Lack of proper supervision**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

15. **Health and safety issues**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

16. **Contractual anomalies**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

17. **Changes in prices of materials and labors**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

18. **Acts of God**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

19. **Restricted access to site**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

APPENDIX-B

SECOND QUESTIONNAIRE

This study is carried out by a graduate student of National University of Sciences and Technology (NUST), Islamabad to determine to determine the causes of disputes between the general contractor and subcontractor, their impact and probability of occurrence. Your response will be very valuable to the study. Please take 5 minutes out of your precious time and fill this form. In case of any query contact umerr89@hotmail.com

Name: _____ (optional)

- ○ Educational background
- ○ Undergraduate degree
- ○ Masters Degree
- ○ PhD
- ○ Diploma
- ○ Technical degree
- ○ Non technical degree

Other _____

Type of organization you are working with

- ○ Client
- ○ Consultant
- ○ Contractor
- ○ Subcontractor
- ○ Supplier/Fabricator

Other_____

Years of experience

- ○ 0-5
- ○ 5-10

- ○ 10-20
- ○ 20 years or above

Country of origin: _____

What is the percentage of subcontracting in your country?

- ○ 10-20%
- ○ 20-40%
- ○ 40-60%
- ○ 60-80%
- ○ 80-100%

Following are the various causes of disputes between the general contractor and subcontractor. Rate these factors depending upon their impact if they occur between the general contractor and subcontractor and their probability of occurrence

0= no impact and no chance of occurrence

5= very high impact and very high chance of occurrence

20. **Delays in payments**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

21. **Change orders**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

22. **Quality of work**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

23. **Errors in drawings and specifications**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

24. **Lack of communication**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

25. **Delays in work**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

26. **Changed conditions**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

27. **Delay in reply to queries**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

28. **Acceleration/suspension of work by the general contractor**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

29. **Estimation errors**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

30. **Incompetent subcontractor**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

31. **Negative attitude of parties**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

32. **Lack of proper supervision**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

33. **Exaggerated claims**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

34. **Contractor provided material**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

35. **Extra works**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

36. **Assigning part of subcontracted works to another subcontractor**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

37. **Absence of general contractor from site**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

38. **Avoiding instructions given by general contractor**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

39. **Absence of subcontractor from site**

Impact	0	1	2	3	4	5
Probability	0	1	2	3	4	5

Any other factor you think can become a cause of dispute between general contractor and subcontractor. State its impact and probability

APPENDIX-C

THIRD QUESTIONNAIRE

Name:
Designation:
Type of Organization

- ○ Client
- ○ Consultant
- ○ Contractor
- ○ Subcontractor

Years of Experience:

- ○ 0-5
- ○ 5-10
- ○ 10-20
- ○ 20 years or above

Q1: When should subcontractor enter into the subcontract?

a) Within twenty days of receiving letter of acceptance
b) When called upon by general contractor
c) Respondent's recommendation

_____

Q2: Who should depute a representative on site?

a) Contractor
b) Subcontractor
c) Both
d) Respondent's recommendation

_____

Q3: If a representative is deputed by the contractor on site, should he have the power to give decisions on time, cost, quality and other affairs related to the execution of project?

a) Yes
b) No
c) Respondent's recommendation

_____

Q4: When should the execution of project be started by the subcontractor?

a) Within fourteen days after contractor's notification

b) Respondents recommendation

_____

Q5: In case of errors in drawings and specifications what should the contractor do

a) Immediately inform the contractor
b) Immediately inform the Architect/Engineer
c) Respondents recommendation

_____

Q6: In which case the extensions of time should be given to the subcontractor?

a) For events in which the subcontractor is not responsible
b) Provided the subcontractor submits a notice within 21 days of the event
c) Provided subcontractor informs the general contractor within forty eight hours
d) Respondents recommendation

_____

Q7: Works executed by the subcontractor should satisfy

a) General contractor
b) Architect/Engineer
c) Both
d) Respondent's recommendation

_____

Q8: In case of conflict which conditions of contract should prevail?

a) Conditions of Main contract
b) Conditions of Subcontract
c) Respondents recommendation

_____

Q9: Should the subcontractor given access to the main contract except its price part

a. Yes
b. No
c. Respondents recommendation

_____

Q10: Who holds the responsibility of health and safety?

a) Contractor
b) Subcontractor

c) Both
d) Respondents recommendation

_____

Q11: Should the subcontractor submit a waste management plant

a. Yes
b. No
c. Respondents recommendation _____

Q12: When should the bonds and securities be provided to the contractor by the subcontractor?

a) Within twenty eight days of letter of acceptance
b) No need to provide performance security and other bonds to the general contractor
c) Respondents recommendation

_____

Q13: Sub sub contracting should take place

a) With the consent of main contractor
b) The decision of architect/engineer shall prevail
c) Respondents recommendation

_____

Q14: Schedule of activities should be submitted by

a) Subcontractor to contractor
b) Contractor to subcontractor
c) Respondents recommendation

_____

Q15: The right to suspend the works can be given to the contractor

a) Yes
b) No
c) Respondents recommendation

_____

Q16: The notice given by subcontractor should be responded by the contractor

a) Within twenty one days
b) Immediately
c) Respondents recommendation

_____

Q17: Should subcontractor be involved in the measurement of quantities of works?

a) Yes

b) No
c) Respondent's recommendation_____

Q18:In case of non agreement on measurement of quantities of work should the contractor have the right to make a fair decision?

a) Yes
b) No
c) Respondents recommendation
_____

Q19: Should the contractor have the right to give instructions to accelerate the work?

a) Yes
b) No
c) Respondents recommendation
_____

Q20: Should progress reports be submitted by the subcontractor?

a) Yes
b) No
c) Respondents recommendation _____

Q21: Should subcontractor be involved in measurement of quantities of work

a) Yes
b) No
c) Respondents recommendation _____

Q22: Payments can be withheld by the contractor if

a) Works are defective
b) Insurance, bonds, performance security is not provided
c) Payments should not be withheld in any condition

d) Respondents recommendation
_____

Q23: When should the payment be given to the subcontractor?

a) Within seventy days of submission of payment statement by the subcontractor
b) Within thirty days of issue of payment by the employer to the contractor

d) Within seven days of payment by the employer to the contractor
e) Respondents recommendation

_____

Q24: When should the final payment be given to the subcontractor

a) Within eighty four days of submission of final payment certificate
b) Within fifty six days of defects notification period
c) Within seven days of payment from the owner to the contractor
d) Respondents recommendation

_____

Q25: Variations can only be acted when given by

a) Contractor
b) Architect/Engineer
c) Respondents recommendation _____

Q26:When should the performance security, if submitted by the subcontractor may be returned?

a) Within twenty eight days after the defects liability certificate is issued
b) Within seven days after the contractor receives security from the employer
c) Respondents recommendation

_____

Q27: The subcontract can be terminated by the contractor if

a) Notice is submitted by the contractor to subcontractor fourteen days before termination
b) If subcontractor does not resolve the issues stated by the contract administrator in the notice within fourteen days
c) If subcontractor does not resolve the issues stated by the contract administrator in the notice within seven days
d) If subcontractor does not resolve the issues stated by the contract administrator in the notice within ten days
e) Respondents recommendation

_____

Q28: Insurance should

a) Be carried out by both contractor and subcontractor

b) Should cover the works for at least four years following the completion of project
c) Respondents recommendation

_____

Q29: What should be the provision regarding dispute resolution?

a) If no resolution is reached within fifty five days of attempt of mutual resolution matter should be passed on to arbitration
b) Subcontractor Dispute Adjudication board consisting of one mutually agreed person should be formed that should resolve matter within forty two days. Else matter should proceed to arbitration
c) If matter is not resolved mutually matter can be directed to arbitration. Decision of arbitrator will be binding upon the parties
d) Matter should be directed to architect/engineer within twenty days. Else matter should be proceeded to mediation or negotiations
e) Parties should first try negotiations. If not successful than mediators should be involved
f) Respondents recommendation

_____