

**SUITABILITY OF ALTERNATIVE DISPUTE
RESOLUTION METHODS BASED ON RISK FACTORS
TO THE SRI LANKAN CONSTRUCTION INDUSTRY**

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Resolution**

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DECLARATION

I declare that this is my own work, and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Suitability of alternative dispute resolution methods based on risk factors to the Sri Lankan construction industry

Disputes within the construction industry seem to be very common. To resolve such disputes, the practice is to go for litigation. However, due to excessive time and cost incurred in litigation, nowadays parties use new innovative dispute resolution methods which are commonly known as Alternative Dispute Resolution (ADR). Negotiation, conciliation, facilitation, mediation, adjudication, arbitration and hybrid models such as Mediation-Arbitration are available in the global context as ADR methods. Out of such ADR methods, negotiation, mediation, conciliation, dispute adjudication board and arbitration are common in Sri Lankan industry practice. It is a common question in the construction industry how a suitable ADR method(s) can be selected. However, most of the research studies conducted in the Sri Lankan context are relevant to the applicability, enforceability, and effectiveness of ADR method(s). Further, it can be noted that research studies are lacking on the choice of ADR method(s) in the local context. Additionally, literature proves risk as a common phenomenon in construction projects can be used as a criterion to select ADR methods. Addressing these research gaps, this research investigates the suitable Alternative Dispute Resolution method(s) based on risk factors for successful dispute resolution in construction projects in Sri Lanka.

A comprehensive literature review was performed on ADR methods and risk factors of construction projects. The data collection of the study was designed under two stages, an expert survey and a questionnaire survey. An expert survey was executed with five experts who have expertise in ADR and risk management in the construction industry. Thus, the expert survey is performed to filter the risk factors under the criteria for the choice of ADR methods. The impacts of filtered risk factors were also gathered. 10 risk factors out of 15 risk factors were taken forward to design the questionnaire survey, the second stage of data collection. Subsequently, a structured questionnaire was developed and distributed among 40 respondents under the purposive sampling method who has expertise in ADR and risks in construction. 34 out of 40 questionnaires were received and data were analysed through the Relative Importance Index (RII) technique. ADR methods were ranked based on RII values against risk factors and designed a matrix to select ADR method(s) based on risk factors of the construction projects in Sri Lanka. The result proves negotiation is the best ADR method while ranking conciliation, mediation, dispute adjudication and arbitration areas suitable respectively.

Keywords: Alternative Dispute Resolution; Choice of Alternative Dispute Resolutions; Risk Factors; Construction Industry

DEDICATION

*I dedicate this dissertation to my beloved
parents for the immense love, care, support,
and encouragement conveyed to me at all
times...*

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It is a great pleasure for me to state my sincere compliment to those who greatly assist me to make the Dissertation a success.

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LIST OF ABBREVIATIONS

ADR	-	Alternative Dispute Resolution
DR	-	Dispute Resolution

CHAPTER ONE

1 INTRODUCTION

1.1 Background

Nowadays, construction projects have become more complex and competitive (Jaffar, Tharim, & Shuib, 2011; San-Cristóbal, Carral, Diaz, Fragueta, & Iglesias, 2018). According to She, Aibinu, and Johnsonm (2010), such complexity in construction projects has led to growing uncertainties, financial, economic and physical risks as well as variations under the projects and documentation complications. Accordingly, disputes within the construction industry seem to be very common, which raise various problems including delays in project delivery, increasing project cost, loss of profit, reduction in productivity, and damage to business relationships (Jaffar et al., 2011). The level of such disputes is identified as more serious (Lee et al., 2017) where most of them require years to get settled (Cheung & Li, 2019; Lu, Li, & Wang, 2017). Although construction stakeholders used to go to courts to resolve disputes, a large amount of time and the cost incurred during the process have led to new innovative dispute resolution methods, which are popular as Alternative Dispute Resolution (ADR) methods (Chaphalkar & Patil, 2012; Harmon, 2003).

ADR methods can be identified as a variety of dispute resolution mechanisms as an alternative to the traditional court system which includes facilitation, negotiation, conciliation, mediation, adjudication, arbitration and hybrid models such as Mediation-Arbitration (Cunningham-Hill & Elder, 2017; Menkel-Meadow, Love, Schneider, & Sternlight, 2005; Ranasinghe & Korale, 2011). Its diverse methods can benefit the parties to resolve their disputes on their terms expeditiously and cheaply (Alberstein, 2016; Cunningham-Hill & Elder, 2017).

Out of the different ADR methods that exist in the construction industry, negotiation can be defined as a “process of working out an agreement by direct communication which is voluntary and non-binding” (Pickavance, 2007, p. 434). The process may be between two parties (bilateral) or it could be among many parties (multilateral). Each party may apply any form of outside expertise it considers necessary, and this is famous as “supported negotiating” (Cunningham-Hill & Elder, 2017). Amicable

settlement can be identified as a common method of dispute resolution between the Employer and the Contractor (Wägenbaur, 2013). In this method, the Employer and the Contractor have experienced a negotiation process and attempted in good faith to settle the dispute in a manner where it brings satisfaction to both parties (Public Procurement Directorate, 2008; Wägenbaur, 2013). Mediation, another popular ADR method is being described by Folger and Bush (2007) as the process which we can follow if the negotiation is unsuccessful. This means a process of entering a third party or impartial person or mediator between the conflicted parties. The mediator controls the process and lets the parties negotiate, but does not make decisions and agreements (Madden, 2001). Conciliation is another ADR method described by Aladia (2017) as “a process by which discussion between parties is kept going through the participation of the conciliator” (p. 793). Further, Aladia has noted that in conciliation, there can be seen situations where the conciliator involves resolving the dispute directly, by making proposals for settlement. Adjudication, being one of the widely accepted ADR methods in the construction industry introduced an impartial third party identified as an Adjudicator to the dispute resolution process and provides a binding decision (Ranasinghe & Korale, 2011). Arbitration, another most popular ADR method in the construction industry is being defined in Halsbury’s Laws of England as “Arbitration means the reference of dispute or difference between not less than two parties, for determination, after judicially hearing both sides, by a person or persons other than a court of competent jurisdiction” (as cited in Aladia, 2017, p. 793). Schooler (2007) has stated that it is important to recognize and appreciate different types of ADR methods and how those can be prepared for the best. Supporting the same, Kirimi and Wanjohi (2019) highlighted that though there are various ADR methods available, the selection and application of an ADR method to a dispute should be done intentionally for successful project delivery. Many researchers, Cheung, Suen, and Lam (2002), Chong and Mohamad-Zin (2012), Ilter and Dikbas (2008) and She (2011) have focused on ADR selection factors concerning features embedded in ADR methods in the global context.

The study of Cheung et al. (2002) and She (2011) identify, cost, fairness, privacy and confidentiality, speed, outcome, relationship, flexibility, enforceability, and creative

remedies as important factors which has an impact on the selection of a suitable ADR method. Except for those attributes, Ilter and Dikbas (2008) highlighted professional behavior, experience in construction and transparency of judgment also matter when choosing an ADR method. Chong and Mohamad-Zin (2012) proposed twenty-seven factors to be considered when choosing an ADR method based on features ADR methods. The result has shown fair treatment, expert judgment and party autonomy are at the top rank out of twenty-seven factors. Illankoon, Tam, and Ranadewa (2019) have explored ADR selection factors within the Sri-Lankan context and proposed fourteen factors by proving time, complexity, and flexibility as the most significant factors. The literature proves most of the researchers have directed on ADR selection factors based on features of ADR methods. However, highlighting a new research area, a study is being conducted for international construction projects by Gad, Kalidindi, Shane, and Strong (2011), resulting project risks have an impact on the choice of ADR methods. Further to Gad et al. (2011), not all the risk factors in construction projects have an impact on the choice of ADR methods.

Excessive variations, lack of communication and weak relationships, scheduled delays, cost overruns, technical risks, inconsistencies in the country's policies, law and regulation changes and inflation are being identified as very common project risk factors in construction projects (Brett, 2000; Eybpoosh, Dikmen, & Birgonul, 2011; Ozorhon, Arditi, Dikmen, & Birgonul, 2007). In the study of Gad et al. (2011), projects risks related to international construction projects have focused on the perspective of choosing the best ADR method. Gad et al. (2011) stated when technicality is high in an international construction project, it is recommended to go for ADR methods where third parties are present who are technically competent. Thus, the research proposed to go for ADR methods such as mediation, arbitration, and expert determination. Further, the authors revealed that when an international construction project opens for scheduled delays, the project team can choose an ADR method that can reach fast decisions.

Although the study of Gad et al. (2011) seems to be effective and useful to choose an efficient ADR method in construction projects, the results of that study cannot be applied to Sri Lankan construction projects since the risk factors are being analyzed

by the researcher based on characteristics of the international construction projects. Therefore, this study focused to conduct a similar study, choice of an ADR method based on risk factors considering the characteristics of Sri-Lankan construction projects.

1.2 Problem Statement

Formation of disputes can be identified as a common problem in the construction industry (Illankoon et al., 2019). Rubin and Quintas (2003) stated that characteristics embedded with each ADR method creates an attractive way to settle the complex and time sensitive disputes. Because of that, ADR has become more popular in modern era in resolving disputes and is spreading fast globally (Cheung, 2006). According to Keršulienė, Zavadskas, and Turskis (2010), still it is questionable that which ADR methods will be best suited for the dispute resolution. Illankoon et al. (2019) have confirmed that most of the research studies done in Sri Lanka on ADR relate to its applicability, enforceability, and effectiveness. Thus, the researchers have proven that there is lack of studies on the choice of an ADR method relevant to the local construction industry.

Further, the literature proves that there are fewer studies available that discuss ADR methods together with risk factors. The study of Gad et al. (2011) highlights existing literature has not addressed the choice of dispute resolution methods based on risk factors in international projects and observed that research gap. Since the study of Gad et al. (2011) is limited to international projects, the research result is not suitable to apply to Sri Lankan construction projects. Thereby, this study will be directed to develop a matrix for the choice of an ADR method(s) based on risk factors from the local point of view.

1.3 Aim and objectives

In line with the research problem, this study aimed to investigate the suitable Alternative Dispute Resolution method(s) based on risk factors for successful dispute resolution in construction projects in Sri Lanka.

The followings are the set objectives of the research.

1. To identify the available ADR methods in the construction industry globally and with reference to Sri Lanka
2. To investigate the risk factors in construction projects in the global context.
3. To investigate the risk factors that influence the selection of ADR method(s) within the Sri Lankan context
4. To develop a matrix by ranking ADR methods to identify the most suitable ADR method(s) based on risk factors to the Sri Lankan context

1.4 Research Methodology

Literature Synthesis

Journals, Conference proceedings, books, technical reports, occasional papers, theses and magazines were observed to collect literature on ADR methods and the risks in the construction industry.

Data Collection and Analysis

In this study, the data collection was carried out in stages, firstly an expert survey and then a questionnaire survey. The expert survey was directed to filter the risk factors based on the choice of ADR methods within the Sri Lankan context since literature proves not all the risk factors have an impact on the choice of ADR methods. Following the findings of the first survey, then the questionnaire survey was prepared to rank each ADR method under risk factors to develop the matrix. Accordingly, the analysis yielded the results to develop a matrix to select the most suitable ADR method(s) based on risk factors.

1.5 Scope and Limitations

The research was focused on ADR methods available in the construction industry of Sri Lanka. The risk factors were considered from the viewpoint of the Employer and the Contractor. The sample of the data collection has targeted the professionals who have experience in dealing with ADR and risk management in the construction industry of Sri Lanka.

1.6 Chapter Breakdown

Chapter One: Introduction

Chapter one provides a detailed and comprehensive background to reach the problem statement, aims and objectives of the study, methodology, scope, and limitations related to the target study.

Chapter Two: Literature Review

Chapter two brings a comprehensive literature review on ADR methods and risk factors in the construction industry. Accordingly, this chapter targets to achieve the set objectives one and two.

Chapter Three: Research Methodology

Chapter three presents an overview of the research methodology. Further, it explains the methods used in data collection.

Chapter Four: Research Analysis and Findings

Chapter four of this study targets the data collection and analyses the literature findings together with the collected data. Thus, this chapter targets to achieve the set objectives three and four.

Chapter Five: Conclusion and recommendations

Chapter five of this study targets to conclude the research findings with recommendations. Further, this chapter provides available study areas for any further research.

CHAPTER TWO

2 LITERATURE SYNTHESIS

2.1 Introduction

Disputes frequently occur in the construction industry, a key player in the national economy due to the complexity of the industry itself. Therein, Alternative Dispute resolution (ADR) methods play a vital role. However, selecting a suitable ADR method to resolve a dispute is challenging and can bring a successful project delivery.

Chapter one of this report presents an introduction to ADR and different types of ADR methods available in resolving disputes in the construction industry, together with their advantages and disadvantages. Subsequently, this study focuses on the necessity of choosing an ADR method and explores available studies for the choice of dispute resolution methods. Then, the study focuses on risk and risk management as a new phenomenon for selecting an ADR method for a construction project by observing risk factors in the construction industry from Employer's and Contractor's perspectives. Finally, this chapter addresses the Sri Lankan context in terms of dispute resolution with reference to commonly accepted ADR methods.

2.2 Introduction to ADR

Disputes are very common in the construction industry (Deif & Abdlrashid, 2017). As the name suggests, disputes arise due to disagreement between the contracting parties. Once there is a disagreement, the contracting parties work on resolving the dispute based on the contract conditions (Illankoon et al., 2019). The Employer and contractor face many difficulties in resolving disputes within the construction industry (Nihaaj, 2016). However, if the parties could still not reach an arrangement, the matter would escalate to ADR. Litigation is the final step toward settling construction disputes where ADR is meant to resolve disputes without resorting to the court system (Mulolo & Mwakali, 2015), which has a voluntary approach (Jayasena & Kavinda, 2011).

ADR methods are popular among parties because they are less formal than the judicial procedures, cost-effective, discreet, maintain ties and sometimes involve an impartial,

neutral third party (Saeb, Mohamed, Mohd-Danuri, & Zakaria, 2018; Thobakgale, Aigbavboa, & Thwala, 2015). Available ADR methods range from negotiation to arbitration involving facilitation, conciliation, mini-trial and mediation (Saeb et al., 2018). However, according to Nihaaj (2016) and Lebovits & Hidalgo (2009), the most popular variants of ADR are negotiation, mediation, conciliation, adjudication and arbitration. Therefore, in the following sub-themes, different features of these different ADR methods have been described along with their advantages and disadvantages.

2.2.1 ADR types in the construction industry

2.2.1.1 Negotiation

Negotiation is a non-binding universal procedure in which two or more participants try to reach a joint decision on matters of common concern when they are in real or potential conflict or disagreement (Deif & Abdlrashid, 2017). Negotiation is an informal universal process that doesn't require a neutral third party (Alaloul, Hasaniyah, & Tayeh, 2018). Compared to procedures involving third parties, negotiation usually helps the disputants to manage the mechanism and the solution themselves (Animashaun & Odeku, 2014). This negotiation strategy is the disputant's preferred option (Moore, 2014). This ADR method doesn't harm the relationship between parties before, during and after the negotiation process (Thobakgale et al., 2015). The parties have full independence in negotiation regarding the form, procedure, and type of agreement and the cultural history of the disputants may also contribute to different strategies for the settlement of conflicts under negotiation (Blankley, 2011; Chong & Zin, 2012).

Advantages and disadvantages of negotiation

This ADR method supports resolving a dispute immediately and efficiently in terms of time and costs and reserves working relationships among parties (Chong & Zin, 2012). This method is considered the easiest, but it relies heavily on the contestant's expectations and ability to put the questions behind them (Alaloul et al., 2018). It is the least expensive method and a swift, voluntary, and unstructured process that can maintain the working relationship between the parties involved (Thobakgale, 2015).

However, negotiations are not always effective in bringing consensus; thus, parties may not come to a settlement (Chong & Zin, 2012). If the negotiations fail, the parties should follow for another ADR method or litigation proceeding (Deif & Abdlrashid, 2017; Alaloul et al., 2018).

2.2.1.2 Mediation

Mediation is known to be more organized, and informal than adjudication and arbitration, non-binding negotiation and is thought to be ADR's most effective process which is used when negotiation is unsuccessful (Alaloul et al., 2018; Zimmer, 2011). Further to the authors, the negotiation process is directed by a neutral and objective third-party expert, known as the mediator, who listens to all parties to the conflict and encourages negotiations between the parties (Fenn, 2011; Barough, Shoubi, & Preece, 2013). The mediator typically begins the process in the same room with both parties and will often split them into different rooms to have private talks or with each of them without records or transcripts (Lebovits & Hidalgo, 2009; Deif & Abdlrashid, 2017). This can be done in a few days, it is not binding, and the mediator has no authority to decide, he simply supports the parties in finding an agreement by clarifying the challenges using a range of skills and strategies to resolve and provide some advice to overcome them (Illankoon et al., 2019; Rozdeiczner & Campa, 2006; Harmon, 2003).

In the initial stage of the mediation, where each party expresses its perception of the dispute and then the mediator tries to minimize the differences and to bring the perceptions of the disputants closer to resolve the dispute (Alaloul et al., 2018; Moore, 2014). This is clear because the meeting is private and confidential, it is healthy conversation where each party will understand the other party's position and can show a solution and keep the parties in business (Saeb et al., 2018). However, the mediator cannot be sought as a witness in the matter before a court, and his notes are confidential and not subject to disclosure to the parties (Deif & Abdlrashid, 2017).

Advantage and disadvantages in Mediation

Mediation preserves trust and potential ties between the disputants, and it is also advantageous as all conflict issues are resolved to face to face rather than by lawyers or other intermediaries; this helps the disputants believe they oversee the settlement

process (Moore, 2014). Mediation process is very informal, fair, and flexible, the agreement is focused on the common needs of the parties and not on detailed rules (Bellucci, Macfarlane, & Zeleznikow, 2010; Charkoudian & Wayne, 2010; Harmon, 2003). Also, the parties could prevent public disclosure of confidential business and financial details (Illankoon et al., 2019). According to Alaloul et al., (2018), Mediation in the building industry is believed to be the fastest-growing ADR process and eliminates uncertainty about judicial outcomes. The parties are all winners in mediation where the disputants have equal opportunities and rights in the contested matter (Chong & Zin, 2012).

Mediation also has some negative features. Mediation is not desirable when involving a hostile group, when one side is irrational, when one side is in a distinctly superior legal position, or when the parties are so antagonistic that negotiations between them are not feasible (Lebovits & Hidalgo, 2009). If the mediator fails to bring all the parties to a mutual agreement, all the time and energy used in mediation could be wasted because the mediator has no power to enforce a solution (Thobakgale et al., 2015; Bellucci et al., 2010).

2.2.1.3 Conciliation

Conciliation is also one of the ADR methods in which the parties to a conflict using a neutral third party (a conciliator), negotiate with the disputants separately in an attempt to develop a common understanding of the root causes of the conflict and thus facilitate resolution in a peaceful and antagonistic manner (Animashaun & Odeku, 2014). The process of the conciliation represents in Figure 2.1.

The main goal of conciliation is to conciliate, most of the time by seeking concessions (Rozdeiczner & Campa, 2006). Further, the authors emphasized that, throughout mediation, the mediator tries to direct the dialogue in a way that optimizes the desires of the participants, considers the emotions and reframes the interactions and, in conciliation, the participants seldom, if ever, face each other around the table in the presence of the conciliator, rather, the conciliator approaches the parties separately.

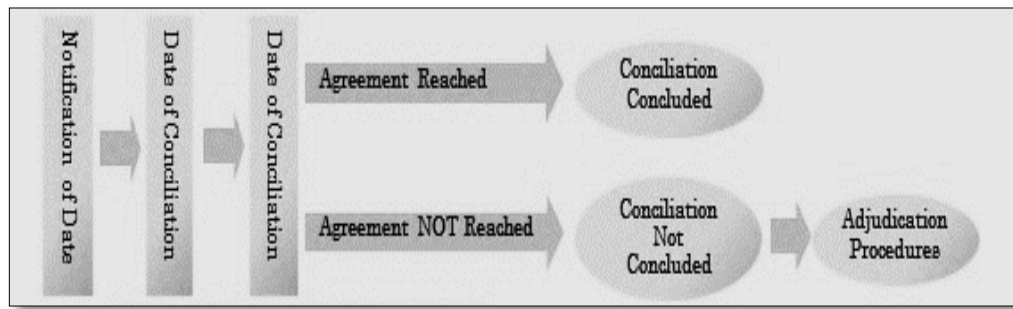


Figure 2.1: Conciliation process

Source: (Monash University, 2014)

Advantage and disadvantages in conciliation

Like mediation, the conciliation process is also informal and therefore flexibility is embedded in this resolution process (Kim, 2019). The conciliator is often an expert in the relevant area of the disputable event; therefore, parties can reach a better agreement. When compared with litigation, conciliation proceedings are economical. The parties have the liberty during this process (Kim, 2019; Mitra, 2018).

Conciliation has no legal recourse since the process is not binding upon the parties (Rozdeiczer & Campa, 2006). Further to the authors, the conciliator typically has no power to request evidence or call witnesses and does not generally write or grant judgments unless parties mutually agree.

2.2.1.4 Adjudication

Adjudication is a type of alternative dispute resolution method which is widely used in the construction sector (Saeb et al., 2018). According to Jayasinghe & Ramachandra (2016), an alternative to arbitration is the use of an adjudication which may be regarded as certain features and benefits, that is, a decision that may be "temporary binding" and which allows for the speedy determination introduced in the construction sector. This Adjudication process is carried out by an impartial individual called an adjudicator chose in a contract by the parties (Ranasinghe & Korale, 2011). An adjudicator is not necessary to be a lawyer and must give a decision on the disputed matters referred to him by the complainant before the dispute is eventually resolved (Deif & Abdlrashid, 2017). Nihaaj (2016) mentioned, that at commencement of the contract, parties agree to the appointment of an adjudicator known as the Dispute

Adjudication Board (DAB) or as sole adjudicator who is required to act as impartial expert. It is therefore essential that the adjudicator must only be a person suitably qualified to interpret technical and contractual matters (Thobakgale et al., 2015).

Abeynayake and Weddikkara (2013) stated that the construction industry is used two forms of statutory and contractual adjudication. Further the authors emphasized that in adjudication, it is equally necessary that the adjudicator adhere to the standards of natural justice. Statutory adjudication is a legal provision provided in an act which provides a statutory right to adjudicate, while contractual adjudication is a provision to adjudicate contractually within the normal types of contracts (Jayasinghe & Ramachandra, 2016; Abeynayake & Weddikara, 2013).

The Adjudication process is performing a reasonably thorough review of the dispute referred to it based on evidence, including investigation, description of the dispute, and legal and contractual matters (Deif & Abdlrashid, 2017). The length of adjudication is limited to the number of days that they have entered into in the contract agreement and the Adjudicator will also have to perform interviews, meetings, and the like to seek more information on the issues at issue (Ranasinghe & Korale, 2011).

Advantages and disadvantages in adjudication

The cost of adjudication is much lower when considering the arbitration costs (Ranasinghe & Korale, 2011). It should also be emphasized that parties who refer their disputes to adjudication will obtain a speedier decision. Accordingly, adjudication is seen as a quick and inexpensive way of settling conflicts in their first instance (Jayasinghe & Ramachandra, 2016). The decision must be outlined by the adjudicator with reasons to justify his point of view and to protect confidentiality as it is done in private (Saeb et al., 2018). Generally, this provides a blinding decision, and it becomes final unless otherwise, parties disagree on the adjudication decision (Deif & Abdlrashid, 2017).

There are a few drawbacks of the DAB process and those can be listed such as the costs inherent in the early establishment of DAB's make this less suitable for smaller-scale construction projects (Abeynayake & Weddikkara, 2013). The decision given by

the adjudicator is not final since the parties have the right to hear the dispute in courts or to go for arbitration according to the contractual provisions (Cunningham-Hill & Elder, 2017; Redmond, 2008). One big downside of DAB is that conflict board decisions cannot be applied in the same way as arbitration awards or court judgments (Deif & Abdlrashid, 2017). Though that virtue is available, most of the decisions of adjudication were accepted as final decisions in the construction industry.

2.2.1.5 Arbitration

Arbitration is also one of the ADR methods in which opposing parties submit their dispute or disagreement for binding arbitration by one or more third parties as impartial in order to resolve conflicts and to make a final decision which is followed by law (Illankoon et al., 2019). In arbitration, the disputants need an arbitrator, an impartial judge to serve as the decision-maker, whereas the disputants do need to consent to be bound by the arbitrator's judgment, which is definitive and implemented by law after each side has heard facts and arguments (Suherman, 2019). Being an arbitrator needs a particular and more comprehensive training and much more experience in the matter of disputes (Zimmer, 2011). The arbitration agreement and the reasoning for the decision are voluntary, the arbitrator's decision is binding in the sense that it will be enforced by the courts against a reticent party (Animashaun & Odeku, 2014). Arbitration is more formal than adjudication in procedural terms (Deif & Abalrashid, 2017; Suherman, 2019).

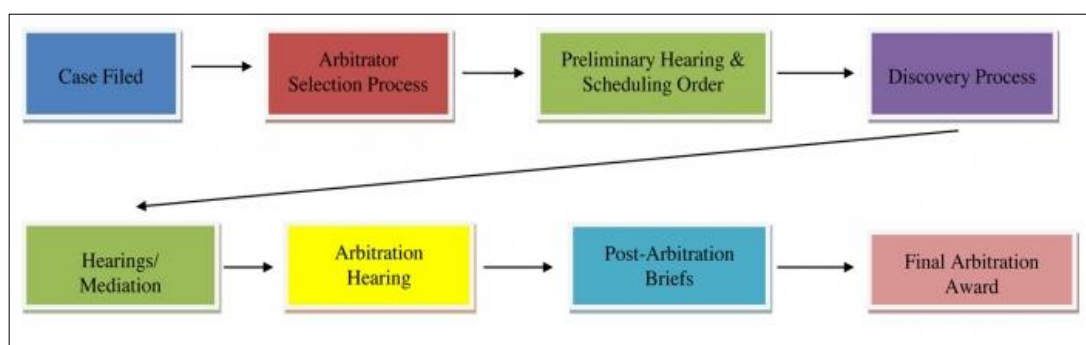


Figure 2.2: Process of arbitration

Source: (Financial Industry Regulatory Authority, 2016)

According to Financial Industry Regulatory Authority (2016), The process of arbitration can be listed as shown in Figure 2.2. The parties may present their evidence to the arbitrator at the outset of the dispute in a manner less formal than a court hearing and witnesses may be cross-examined and then the arbitration hearing shall be scheduled in consultation with the arbitrator and the disputants (Alaloul et al., 2018; Nihaaj, 20016).

Advantages and disadvantages in arbitration

Arbitration hearings are private and are attended by arbitrators only, and the disputants remain confidential (Suherman, 2019). This is seen as the final mode of alternative conflict resolution and as one approach that can significantly reduce the time and money spent on finding a settlement that goes beyond the normal benefits of arbitration, such as anonymity, duration, flexibility and the arbitrator's choice (Abeynayake & Weddikkara, 2013; Barough et al., 2013). These advantages are further elaborated below.

Flexibility

The arbitration procedure allows the parties to plan and decide on all procedures, laws, times and so on that suit their needs and the specifics of the subject matter in dispute that make up the flexibility of the arbitration mechanism where the appeal is not available (Thobakgale, Aigbavboa, & Thwala, 2015). The versatility also enables the parties to choose the arbitrators with the required expertise, language, and any institutional rules (Deif & Abdlrashid, 2017).

Neutrality

Neutrality in arbitration covers this uncertainty and provides a smart solution that captured the confidence of the disputing parties, and that arbitration became the priority dispute resolution mechanism for international business contracting organizations (Deif & Abdlrashid, 2017).

Confidentiality

Some of the business partners do not appreciate the ads inherent in the litigation, while the arbitration proceedings safeguard the confidentiality preferred and accepted by the

disputing parties, in important projects of public interest (Thobakgale, Aigbavboa, & Thwala, 2015). In the arbitration agreement, confidentiality may be conveyed into account of the parties' interests and the extent of confidentiality agreed (Deif & Abdlrashid, 2017).

Finality and Enforcement of the award

The arbitration award can be contested in certain circumstances, as discussed above, whereas it is also considered final and binding and shall be promptly enforced by the parties efficient and the finality provides a consistent means of time, and the appeal proceedings in the litigation may affect cost control (Deif & Abdlrashid, 2017).

The arbitration decision is unlikely to be revoked except in cases of fraud, corruption, arbitration misconduct, prejudice of a party's rights or refusal to hear evidence (Alaloul et al., 2018). Other parties can attend but only with the consent of the arbitrators and the disputants (Harmon, 2003). Also, Deif & Abdlrashid (2017) mentioned that, unlike litigation, the use of arbitration requires that all parties consent.

In Sri Lankan context also, some drawbacks are identified as delay in the proceedings, high costs of the arbitrators and other facilities, greater involvement of lawyers, less concentration on technical issues, lack of awareness, various resolutions passed by different arbitrators, difficulty in contesting the award, inability to conduct multi-party disputes using arbitration and limited jurisdictions, the same procedure applies to all disputes, impossibility of preserving the relationship between the parties and less operation satisfaction (Abeynayake & Weddikkara, 2013).

2.2.1.6 Hybrid methods

Mediation-Arbitration

Mediation-Arbitration is also one of the ADR methods under the hybrid or mixed ADR approach where the role of the neutral is to play the role of a mediator and then play the role of an arbitrator (Deason, 2013; Barsky, 2013; Drummond, 2006). Mediation-Arbitration is an example of multi-step ADR, the parties decide to mediate their conflict on the basis that any issues not resolved through mediation will be resolved through arbitration, using the same person to serve as mediator and arbitrator (Blankley, 2011).

Advantages and disadvantages in mediation-arbitration

The advantage of this hybrid over other ADR methods is that it enhances the achievement of a solution during the mediation stage because both parties are unlikely to be favored in arbitration, which is a must in case of failure of mediation, and while the parties have control over mediation methods, they lose such control during the arbitration stage (Deason, 2013). Nevertheless, Chan (2014) stated, that further advantages as time and money are saved since the success rate is higher than in stand-alone mediation.

One of the drawbacks of this method is that it is doubtful that a neutral third party would be able to remain impartial throughout the arbitration procedure after mediation failure because the neutral party was exposed to sensitive information during the caucus stage during the mediation process which may affect the arbitration decision (Harmon, 2003).

Table 2.1 demonstrates a summary of the advantages and disadvantages of the most common ADR methods used in construction projects. The blue highlighted cells of the table represent advantages whereas the green highlighted cells of the table represent disadvantages of each method.

Table 2.1 Comparison of advantages and disadvantages of ADR methods

Characteristics	Negotiation	Mediation	Conciliation	Dispute adjudication board	Arbitration
Speediness	High	High	Medium	Medium	Low
Cost	Cost is very low	Cost is very low	Cost is low	Cost is high	Cost is high
Confidentiality	The parties have the option of negotiating publicly or privately	The process is strictly confidential between parties to the Contract	The process is confidential	The information or documents provided are treated as confidential	Confidential
Flexibility	Act as a flexible form of dispute resolution, a voluntary process, parties can decide whether to go for negotiation or not	Flexible, range of issues can be addressed, Minimal written records	Flexible	Party autonomy is available, and this is an inquisitorial process (where expert can bring his own knowledge in to the judgement)	Party autonomy is available, Adversarial process where decision is purely based on evidences and facts.
Third party involvement	Third party involvement is not essential. It depends with the opinions of the parties	Third party is presence in ADR process as a facilitator.	Third party is presence in ADR process as a decision maker	Third party is presence to provide the decision	Third party is presence to provide the decision
Relationships	Negotiation supports to enhance the relationship between parties	Can preserve the good relationship	Can preserve relationships	Can be affected to the relationship of parties	Can be affected to the relationship of parties
Decision	Non-binding, Parties might not be able to reach to an agreement as they may be incapable of making any progress towards a solution, once a party chooses to terminate negotiations may do so at any time in the process, notwithstanding the time, effort and money that may have been invested by the other party or parties.	Non-binding, if no agreement is being made, then each party have to bear the invested time, cost and time and no binding decision in such circumstances	Non blinding, if parties mutually agree, a mutual agreement can be drafted.	Decision is binding but not final.	Decision if final and binding, can challenge in court if parties dishonored to the award, parties have no control over the outcome.

2.3 Why it is required to select a suitable ADR method to a construction project

Harmon (2003) and Jaffar, Tharim, and Shuib (2011) have stated that the construction industry is generally considered complex, and this complexity leads to disputes. In general, most of the construction projects are contractual and executed through contracts. Such contracts are generally difficult to interpret even by professionals (Iyer, Chaphalkar, & Joshi, 2008). Cheung and Yiu (2007) highlighted that the afore-described adversarial nature of the construction industry has brought difficulty to manage construction disputes. Since failure to resolve disputes can severely affect all the parties in the project (Keršulienė, Zavadskas, & Turskis, 2010), it is beneficial to use ADR methods to resolve disputes.

As presented in Section 2.2, though there are many ADR methods present in the construction industry, Chau (2007) argued that there is no single ADR method which can apply effectively and efficiently to every individual case universally. Accordingly, the studies have been directed toward factors affecting the choice of the suitable dispute resolution methods as described in Section 2.4.

2.4 Available ADR selection criteria exist in global context

Parties to a dispute always attempt to identify the most applicable dispute resolution method with the questions of which procedure is more applicable to make a decision, and which method will manage the conflict in an appropriate manner (Keršulienė et al., 2010). However, Keršulienė et al. (2010) stated it always remains nebulous. In the existing literature, there can be seen many researchers explored an answer to the above question and come up with their conclusions. Some of those results are discussed henceforth in this study.

According to Chan, Suen, and Chan (2006), there are selection criteria used by parties to disputes prior to select a resolution method. The authors developed a selection model for resolving disputes and the model includes confidentiality, controllability of the process by third parties, safeguarding business relationships, minimizing the adverse effect because of the differences in cultures, ability to enforce, cost reduction and speediness as some of the main selection criteria. Goltsman, Hörner, Pavlov, and

Squintani (2009) compared negotiation, mediation, and arbitration to identify how the performance of each ADR can optimize. The study conducted by Keršulienė et al. (2010) observed six attributes as the most important attributes which govern the selection of dispute resolution methods. These are; expedition of dispute resolution, confidentiality, price of dispute resolution, possibility to appeal, legal advice and authority of the person solving the dispute.

Cheung et al. (2002) has developed a hierarchical structure of ADR attributes that can govern an effective ADR process by observing available literature. The hierarchical development of Cheung et al. is shown in Figure 2.3

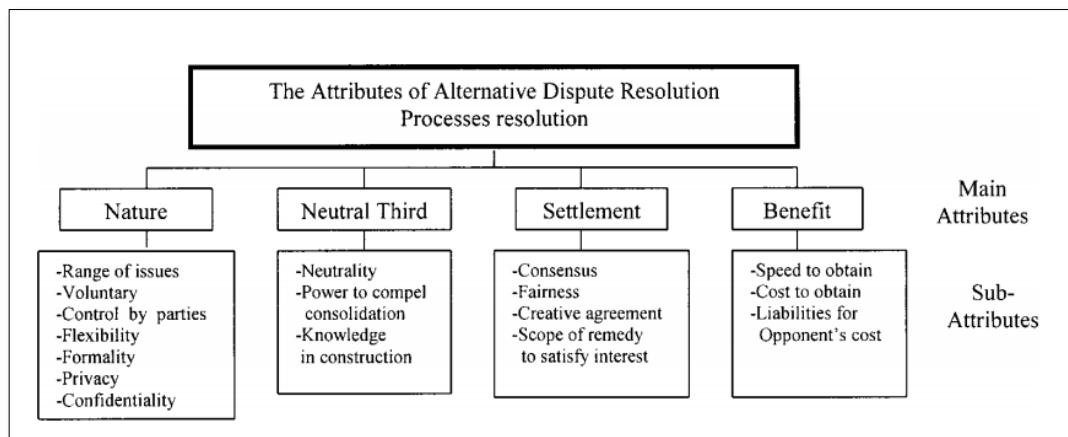


Figure 2.3: Hierarchical structure of ADR attributes

Source: (Cheung et al., 2002)

Chong and Mohamad-Zin (2012) researched the behavior of dispute resolution in the construction industry of Malaysia. During that study, twenty-seven factors have been identified as factors that effect to the choice of dispute resolution method. Those factors listed below.

1. Complexity of the dispute
2. Controlling of the process by the parties
3. Helping the partities to understand each other demands
4. Fair treatment of both partities during the negotiation process
5. The parties are free to look for other dispute resolution methods
6. Voluntary process
7. Speedy of the process
8. Economical
9. Preservation of relationships

- | | |
|--|------------------------------------|
| 10. Resolving the disputes without involving legal profession | 18. Saving the trial expenses |
| 11. Meeting the budget | 19. Finality of the settlement |
| 12. Flexibility | 20. Privacy of the process |
| 13. Providing the parties with the relevant background details | 21. Expert judgement |
| 14. Third party helps to negotiate | 22. Complex dispute |
| 15. Provide qualified neutral expert | 23. Enforceability of the decision |
| 16. Improvement of cash flow | 24. Bindingness of the decision |
| 17. Confidentiality of process | 25. Ability to appeal |
| | 26. Long period of the process |
| | 27. Formality of the process |

All the above studies have identified factors for the choice of an ADR method based on characteristics of various ADR methods. Therefore, this study focused to investigate ADR methods together with risk and risk management principles to develop a new structure that can govern the choice of an ADR method for a construction project based on risk factors. Accordingly, Section 2.5 of this study directed to risk and risk management and its use in dispute resolution.

2.5 Risk as a phenomenon to choose the most suitable ADR method to a given project

Construction projects are always unique, very complex and strategic in nature. Therefore, none of the construction projects are risk-free in practical scenarios (N. Banaitiene & Banaitis, 2012; S. Mishra & Mishra, 2016). Therefore, it is beneficial to look into risk and risk management in construction projects to identify how an ADR method can be selected based on risk factors in construction projects. Therefore, Section 2.5.1 and Section 2.5.2 will be discussed risk in construction projects.

2.5.1 Introduction to risk in construction projects

Risk is a common and an important phenomenon in most of the scientific fields, yet the way risk can be defined and interpreted is no consensus (Aven, 2011). The Project Management Institute (PMI) has addressed risk as “an uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives” (Project Management Institute, 2013, p. 559). Further, it can be defined as the probability of a

damaging event happening in the project which can affect project objectives (Yu, 2002; Baloi & Price, 2003). Risk is not always bringing negative results, which can represent opportunities as well (Baloi & Price, 2003; Zavadskas, Turskis, & Tamošaitienė, 2010). According to Dziadosz and Rejment (2015), the risk is a measurable part of uncertainty that allows to calculate the size of the damage and the probability of occurring the risk event. If anyone needs to address risks in construction projects, their attention should direct toward risk factors in construction projects.

2.5.2 Risk factors in construction projects: Employer's and Contractor's perspective

A greater number of risks are associated with construction projects (Khattak et al., 2019; Zavadskas et al., 2010). Khattak et al. (2019) described the identification of risks as one of the most crucial and important areas in decision-making in the construction industry. The literature proves that project risks are possible to address from two different perspectives. On one side from Employer, one of the key stakeholders and decision-maker (Bryde & Volm, 2009), and on the other side Contractor (Serpella, Ferrada, Howard, & Rubio, 2014).). N.A Kartam and Kartam (2011) emphasized there two parties have unlike behaviors when facing project risks (N.A. Kartam & Kartam, 2001).

Table 2.2: Risk factors in construction projects from the perspective of the Employer and the Contractor

No	Sources Risk factors in construction projects	Chang, Hwang, Deng, and Zhao (2018)	Goh, Abdul-Rahman, and Abdul-Samad (2013)	Zavadskas et al. (2010)	Banaitiene & Banaitis, 2012	Dey (2002).	S. Mishra and Mishra (2016)	Eybpooosh, Dikmen, and Birgonul, (2011)	Wang, Liu, and Chou (2006)	Wu, Nisar, Kapletia, and Prabhakar (2017)	Mulolo, Alinaitwe, and Mwakali (2015)	N.A. Kartam and Kartam (2001)	Mhatre, Thakkar, and Maiti (2017)	Gad et al. (2011)
		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
1	Cost risk; construction cost overruns, financial failures, delayed payments	x		x	x			x		x	x			x
2	Defective work	x		x				x				x	x	x
3	Technological risk; Technology changes	x		x	x	x	x	x			x			x
4	Changes in Laws and local standards, political risks	x		x	x			x		x	x			x
5	Time risk; scheduled delays		x	x				x			x			x
6	Lack of availability of resources		x	x			x	x		x		x	x	
7	Lack of communication and team collaboration		x	x	x		x	x		x	x	x		x
8	Variations; Scope and design changes		x	x	x	x	x		x	x	x			x
9	Environmental risks; weather and climatic issues, unknown geological and site conditions		x	x	x	x	x	x				x		x
10	Economic changes; Inflation, tax			x	x			x		x	x	x		x
11	Documents and information risk			x	x			x						
12	Legal risks; Excessive procedures for statutory clearances and approvals					x	x			x	x			x
13	Lack of experience and skills							x				x		
14	Accidents at site								x	x		x	x	
15	Social risks; language barriers, various cultures										x			x

Table 2.2 collects the risk factors in the construction industry from Employer's and Contractor's perspectives to analyse them to identify the most applicable ADR method. The findings explored from existing literature on risk factors in construction projects from Employer's and Contractor's perspectives can be summarized as shown in Table 2.3.

Table 2.3: Summary of collected risk factors in construction projects

Source	Number of risk factors collected	Number of new risk factors collected	Cumulative number of risk factors
S1	4	4	4
S2	5	5	9
S3	11	2	11
S4	8	0	11
S5	4	1	12
S6	6	0	12
S7	11	1	13
S8	2	1	14
S9	8	0	14
S10	9	1	15
S11	7	0	15
S12	3	0	15
S13	6	0	15

The content in Table 2.3 is graphically represented with a chart in Figure 2.4. As shown in the chart, after S10, none of the new risk factors have been collected. Thus, 15 risk factors have become constant marking the data redundancy point in terms of risk factors in construction projects from the viewpoint of the Employer and the Contractor.

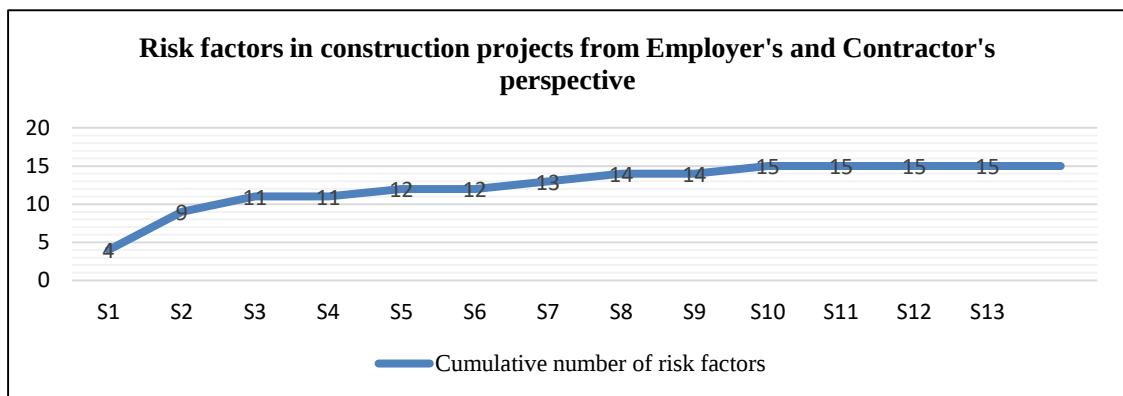


Figure 2.4: Data redundancy point of risk factors in construction industry from Employer's and Contractor's perspective

The aforementioned risk factors carried forward to the data analysis section of this study in order to develop the matrix from the choice of the most suitable ADR method(s) based on risk factors.

2.6 Sri Lankan context and use of ADR methods

2.6.1 ADR in Sri Lankan construction industry

The construction industry in Sri Lanka consists of a complex and comprehensive field of activities (Abeynayake & Weddikkara, 2013). The complexity embedded in construction activities have led to arise different types of disputes. Therefore, parties to disputes always seek resolution methods. Commonly accepted ADR methods in the Sri Lankan construction industry can be identified by observing the studies conducted in Sri Lanka. Accordingly, negotiation, mediation, conciliation, adjudication and arbitration can be highlighted as commonly use ADR methods within Sri Lanka (Abeynayake & Weddikkara, 2013; Jayasena & Kavinda, 2011; Jayasinghe & Ramachandra, 2016; Ranasinghe & Korale, 2011; Soorige & Abeynayake, 2015). The study of Jayasena and Kavinda (2011) proves out of the available dispute resolution methods, negotiation is the preferred choice of dispute resolution in the Sri Lankan construction industry.

2.6.2 Characteristics of ADR methods in Sri Lankan construction industry

According to the literature conducted for the Sri Lankan context, the following five ADR methods can be summarized as ADR methods used within the construction industry of Sri Lanka.

- Negotiation
- Mediation
- Conciliation
- Adjudication
- Arbitration

Using the Delphi technique, Abeynayake (2014) has identified critical factors affecting on ADR process based on characteristics embedded in ADR methods. Further a critical analysis is being carried out on each factor among above mentioned five ADR methods

in Sri Lankan construction industry and ranked those ADR methods using Relative Important Index values. The findings of that study are summarized in Table 2.4

Table 2.4: Critical factors of ADR methods in Sri Lanka

Source: (Abeynayake, 2014)

Critical factors of ADR methods based on characteristics	Ranking of the ADR methods based on RII value				
	1	2	3	4	5
Time duration	Negotiation	Adjudication	Arbitration	Mediation	Conciliation
The cost involved in the process	Negotiation	Mediation	Adjudication	Arbitration	Conciliation
The party autonomy	Arbitration	Adjudication	Negotiation	Mediation	Conciliation
Preservation of relationships	Negotiation	Mediation	Arbitration	Adjudication	Conciliation
Flexibility	Negotiation	Mediation	Adjudication	Arbitration	Conciliation
Confidentiality	Arbitration	Adjudication	Negotiation	Mediation	Conciliation
Enforceability	Arbitration	Adjudication	Mediation	Negotiation	Conciliation
Fair decision	Adjudication	Arbitration	Negotiation	Mediation	Conciliation
Creative remedy	Mediation	Arbitration	Negotiation	Adjudication	Conciliation
Bindingness	Arbitration	Adjudication	Mediation	Negotiation	Conciliation
Expert involvement	Arbitration	Adjudication	Negotiation	Mediation	Conciliation

Since the aim of this study can be achieved by a comprehensive analysis of risk factors in the construction industry with their relationship among the afore highlighted ADR characteristics in construction projects in Sri Lanka, the results highlighted in Table 2.4 will be carried forward to the chapter four of this study.

2.6.3 ADR selection methods in Sri Lanka

Similar to the Global context described in Section 2.4, there are research studies focused on the choice of ADR methods in Sri Lanka as well. Jayasena and Kainda (2011) observed the most appropriate dispute resolution strategy applicable to the Sri

Lankan context. The result of that study yielded that degree of control by the parties, voluntariness, confidentiality, flexibility, speed, relative cost and preservation of business relations as the top seven factors which govern the choice of dispute resolution method within the Sri Lankan construction industry.

Further, the degree of controllability by parties is identified as the main factor out of those seven factors. Illankoon et al., (2019) studied significant factors which govern the choice of an ADR method in the Sri Lankan context using the Relative Important Index (RII). The result of the study is shown in Table 2.5

Table 2.5: Factors affecting the selection of ADR methods in Sri Lanka

Source: (Illankoon et al., 2019)

Factors affecting the selection of ADR methods	RII	Rank
Time to reach a settlement	0.900	1
Complexity of the dispute	0.871	2
Flexibility in implementation	0.857	3
Ability to appeal if not satisfied with the result	0.857	4
Confidentiality	0.843	5
Bindingness of the decision	0.814	6
Degree of formality	0.814	7
Degree of control by parties	0.800	8
Enforceability of the method	0.800	9
Cost of implementing the methods	0.786	10
Suitability in local law system	0.786	11
Preservation of relationship between parties	0.757	12
Type of contract	0.729	13
Third party control on the process	0.657	14

Abenayake and Weddikara (2012) identified twenty-two critical success factors related to adjudication and arbitration observing the behavior of disputes in Sri Lankan construction projects. Although many researchers have focused on factors to consider when selecting an ADR method for a dispute, none of the studies have analysed how risk factors in the construction industry can be used for the choice of ADR methods based in Sri Lanka. Hence, this study focused to investigate the suitable ADR method to dispute resolution based on risk factors in construction projects in Sri Lanka.

2.7 Chapter Summary

This chapter highlights what ADR means and what are the ADR types available in the construction industry together with their advantages and disadvantages. Then, the attention was directed to risk in the construction industry. Flowingly, the study explores various risk factors in the construction industry to bring forward to data analysis chapter of this study to identify how risk factors can be used for the choice of an ADR method. Finally, this chapter focused on ADR methods and existing studies conducted on the choice of ADR methods based on the Sri Lankan context.

CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 Introduction

Chapter two of this research revealed the literature findings to emphasize the available ADR methods in the construction industry concurrently with the risk factors of the same industry. Accordingly, this chapter focuses on the measures taken to undertake the research aim and objectives exposed in chapter one. This chapter discusses the research design simultaneously with the research approach, strategy, data collection techniques and data analysis techniques. Further, it has specifically disclosed the facts specific to this study.

3.2 Research Design

Vogt, Gardner, and Haeffele (2012) expressed research design as the fundamental of the study because it determines the study's flow and reveals the methods of countering the researcher's questions and theories. Further, it is a plan for assembling, quantifying, and analysing data (Lapan, Quartarol, & Rieme, 2011). According to the view of Gray (2014), a typical research design elaborates the research approach, research methodology, data collection techniques, data analysis techniques and research conclusions which are used to accomplish the research aim and objectives. Figure 3.1 portrays the series of actions taken to accomplish the research aim of the particular study.

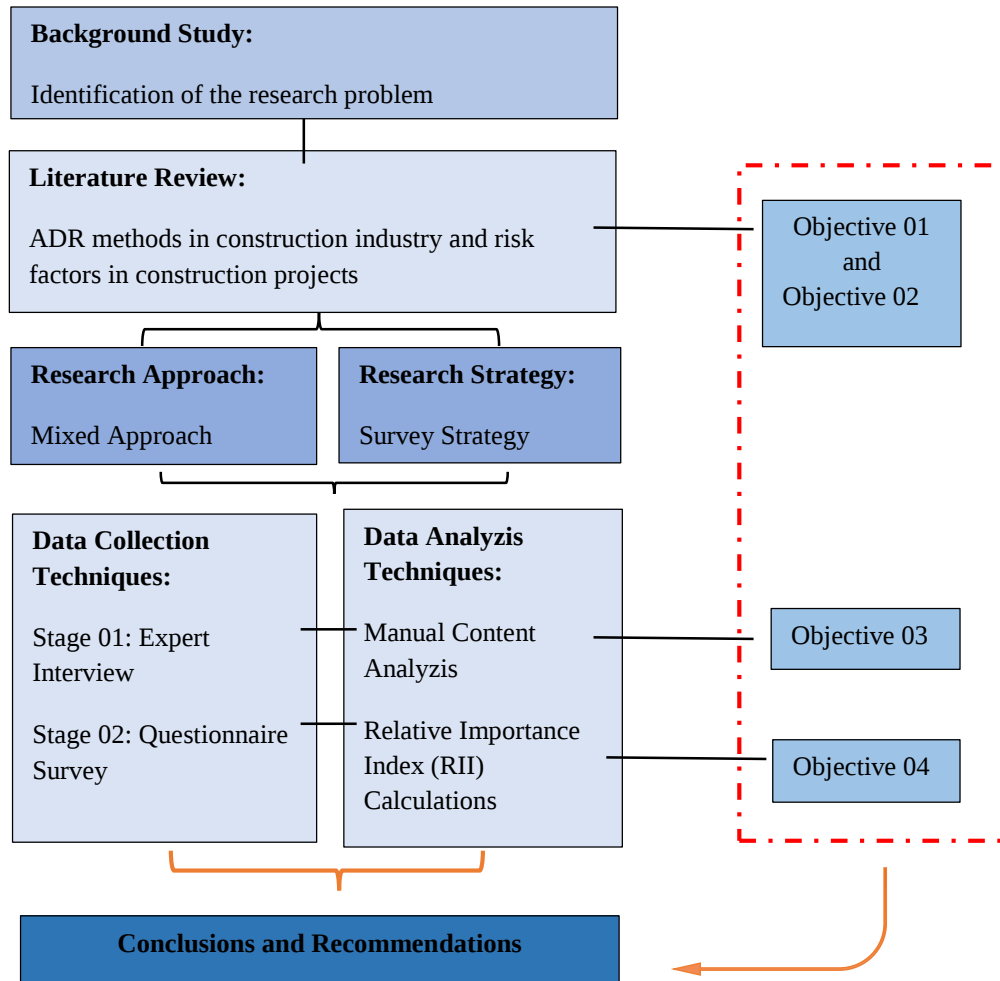


Figure 3.1: Research design

Bordens and Abbott (2011) disclose the importance of the proper selection of the research design highlighting its contribution to the conclusions. Further to the authors, the research findings are subjective with the particular research design and appropriate selection is vital to ensure the success of the research.

3.3 Background Study

Background study can be explained as the commencing step of the research, which is accompanied to recognize the research area. Further, this is vital for determining the research problem, aim, objectives, and scope. This study has utilized the main sources of journal articles, conference proceedings, books, electronic sources, and unpublished thesis to establish the background.

3.4 Literature Review

A critical review of available literature sources was accompanied with the purpose of identifying the available ADR methods in the construction industry in the global context, and with reference to Sri Lanka. Further, risk factors of construction projects were recognized in the global context. Journal publications, conference proceedings, books, and electronic media were used to develop the flow of the literature. More importantly, Objective 01 and Objective 02 of the study have been attained through the literature review.

3.5 Research Approach

The selection of the research approach can be recognized as the supervision action, which is taken to successfully investigate the research aim (Fellows & Liu, 2003). Further, Creswell (2014) elaborates on the idea that the research approach describes the procedure to be followed in data collection, analysis, and interpretation of the study. There are three main research approaches namely: qualitative, quantitative, and mixed (Mohajan, 2017; Parylo, 2012). Since the research approach is a parameter to organize the tasks that are to be performed to investigate the research aim (Thurairajah, Haigh, & Amaratunga, 2006), it is important to have a vital selection. Accordingly, a detailed investigation of the available research approaches provides the opportunity to identify the unique features of each approach. Table 3.1 discloses the features of different research approaches.

The aim of this study is to investigate the suitable ADR method(s) based on risk factors for successful dispute resolution in construction projects in Sri Lanka. Accordingly, the mixed research approach was adopted for the study. The key concern behind the selection is the requirement to have an in-depth investigation of the risk factors that influence the selection of ADR method(s) within the Sri Lankan context (Objective 03) and to rank the ADR methods to develop a matrix for the choice of ADR method(s) (Objective 04). Since the qualitative research approach provides a valid basis for theoretical ideas (Harrison, Lin, Carrol, & Carley, 2007) and helps to assess the concepts and opinions (Braun & Clarke, 2006), the plan is to adapt qualitative concepts in this research.

Table 3.1: Characteristics of different research approaches

Characteristics	Research Approach		
	Quantitative	Qualitative	Mixed
Suitable for	Predetermined research problems	Emerging research problems	Both occasions
Type of Questions	Closed-ended questions	Open-ended questions	Both question types are used
Feasibility of the study	Stable	Flexible	Mix of both
Type of data	Performance data, attitude data, observational data, and census data	Interview data, observation data, document data, and audio-visual data	Combination of the above data types
Data analysis technique	Statistical Analysis	Text and image analysis	Combination of both techniques
Objectives of the analysis	To quantify the variation	To describe the variation	The mix of the above objectives
Interpretation	Statistical	Themes and patterns	Combination

Source: (Creswell, 2014)

Since objective four of the study is to rank the ADR methods based on the risk factors of the construction projects, identified that the opinion of a higher population provides high reliability and validity (Heale & Twycross, 2015). Hence, the quantitative approach was considered more suitable to accomplish Objective four. Accordingly, it is evident that both qualitative and quantitative approaches are required to be utilized in this research simultaneously. Hence, the mixed research approach is identified as the most appropriate selection for this study.

The research aim of this study seems biased toward the qualitative views which is to develop a framework. However, for the successful development of the matrix to identify the most suitable ADR method(s), it can be noted that quantitative result is also vital. Accordingly, the importance of the combination of the two approaches is proved. Hence mixed approach has practised as it improves the rigour of the study and provides a fair basis for the functioning of the research topic (Creswell & Clark, 2011).

3.6 Research Strategy

Mohajan (2017) defined the research strategy as the technique for the identification of research problems to provide precise solutions. Further, it is the general overview that structures the implementation of the research study (Datt, Defining research strategy in a research paper on business studies, 2016). Yin (2014) has developed the argument that multiple research strategies can be adopted to implement the research successfully and has identified a variety of research strategies such as surveys, case studies, archival analysis, experiments, and histories.

This study utilizes the survey strategy for the accomplishment of the research aim. Survey research strategy can be quantitative or qualitative and assists to provide useful solutions to emerging problems (Salaria, 2012). Moreover, it answers the research questions associated with who, what, where, how many, and how much (Fellows & Liu, 2015) with the help of data collection techniques of interviews, questionnaires, and discussions (Taylor, Sinha, & Goshal, 2006). Accordingly, it is proved that survey is the most suitable strategy for this study because it attempts to provide solutions to the emerging problem of fewer studies on risk factors for the choice of an ADR method(s) in the Sri Lankan context by identifying the concentrated set of ideas and experiences of experts regarding the influence of risk factors in the choice of ADR method(s) and by developing a matrix with the ranked ADR method(s) through detailed findings.

Objective 03 of this study is to investigate the risk factors that influence the selection of ADR method(s) within the Sri Lankan context. For the accomplishment of this objective, ideas from a group of people with specialized knowledge in the area are required to have valid results. Further, for the last objective, to develop a matrix by ranking ADR methods to identify the most suitable ADR method(s) based on risk factors to the Sri Lankan context (Objective 04) requires the opinion of disseminated community to ensure the consistency of the results. Further, to increase reliability, a variety of stakeholders from quantity surveying, engineering, and legal backgrounds of construction projects have participated as respondents. Accordingly, Objectives 03, and 04 were achieved using the survey strategy.

3.7 Research Techniques

Research technique plays a significant role in data collection because it helps to eliminate the practical issues in conducting the data collection (Walliman, 2010). According to MacDonald and Headlam (2011), data collection and data analysis can be identified as the two main research techniques. The upcoming subsections describe the data collection techniques and data analysis techniques adopted in this study.

3.7.1 Data collection techniques

There is a variety of data collection techniques observed in the research process. Interviews, physical artifacts, documentation, archival records, and observations are the main sources for data collection (Yin, 2014). The selection of appropriate data collection techniques ensures the validity of the research findings. Accordingly, qualitative, and quantitative findings required for the propagation of this study were collected. For that, two data collection techniques under two main stages: Stage 01- Expert Interviews and Stage 02- Questionnaire Survey were followed.

Sampling Techniques

Sampling can be identified as the procedure follows to collect data about an entire population by investigating only a part of it (Haque, 2010). Further, the author has stated probability sampling and non-probability sampling as the two main techniques used for the definition of the sample. Specifically, (Rowley, 2014) revealed the importance of selecting the research sampling technique with the benchmark of the research problem, and data collection technique. Since the research problem is the fewer studies on risk factors for the choice of an ADR method and the research aim is to investigate the suitable ADR method(s) based on risk factors of construction projects for successful dispute resolution in construction projects in Sri Lanka, respondents' credibility on construction risks and ADR methods are essential. Accordingly, non-probability sampling was used in both stages of data collection. Among the variety of non-probability sampling techniques available, purposive sampling is selected as the most suitable sampling method for this study.

The expert interviews have followed the purposive sampling, which is also identified as judgmental sampling. Consequent to the limited availability of professionals with knowledge of both aspects, the respondents were selected concerning the purpose of the study, which requires knowledge and experience related to construction risks and ADR methods.

The questionnaire survey of this study is also arranged to conduct under the purposive sampling method to bring out a precise result. In fact, respondents who have more than 10 years of experience in the construction industry and have at least 5 years of experience and knowledge in dispute resolution were taken into consideration for collecting data. Forty (40) questionnaires were distributed to selected respondents under the questionnaire survey.

According to the rule of thumb proposed by Roscoe (1975, as cited in Sekaran & Bougie, 2016), “Sample size larger than 30 and less than 500 are appropriate for most research” (p. 264). Further, research topic, population, the aim of the study, research analysis technique, and sample size used for similar studies are also being identified as governing factors in determining sample size for any research (Davies, Williams & Yanchar, 2008). Further, Delice (2010) has conducted research on the topic of “the sampling issues in quantitative research” by analysing 90 master theses submitted to the Science and Mathematics Educational Departments of 10 universities in turkey. In the said study, the distribution of theses in terms of sample size is being studied and the result depicts sample size within 30 to 50 is the widely-used sample size range where quantitative research techniques are being used. Since this questionnaire survey was also conducted in a quantitative approach, 40 questionnaires are determined as a sufficient sample size to proceed with the data analysis to produce a precise result for this study.

3.7.1.1 Stage 01- Expert interviews

Expert interviews were conducted as the Stage 01 of data collection to achieve objectives 03 of this study which is to have an in-depth investigation of the risk factors in construction projects in the context of Sri Lanka and to filter the risk factors which have an impact on the ADR method respectively. Accordingly, five (05) experts, who

have more than ten (10) years of industry experience in the use of ADR and risk management in construction projects have participated. The number of respondents was decided concerning the data saturation. The interviews were conducted as semi-structured interviews (Appendix A).

The conditions followed for the definition of experts have been organized considering the status of incorporation of ADR methods, and the status of practicing the risk management in construction projects. Accordingly, 10 years of experience is considered sufficient. Further, both online interviews through the Zoom platform and face-to-face interviews were conducted and digital recording and note-taking were practiced ensuring the reliability of the results. Refer to Table 4.1 for the profile of the interviewees.

3.7.1.2 Stage 02- Questionnaire survey

According to Rowley (2014), questionnaire surveys are suitable for proficient data collection in large amounts. The last objective of this study is to rank the ADR methods based on the risk factors of construction projects and to develop a matrix to identify the most suitable ADR method(s) that requires opinions from a large group of people. The questionnaire survey was the data collection technique followed to fulfil this requirement. The targeted respondents were provided with the questionnaire (refer to Appendix B) distributed through email. The questionnaire was developed with Likert scale questions to determine the rank obtained for each ADR method based on the risk factors.

3.7.2 Data analysis techniques

The study adopted distinct data analysis techniques for the analysis of the findings through expert interviews and questionnaires (qualitative and quantitative data respectively). The upcoming subsections have described the data analysis techniques incorporated into this study.

3.7.2.1 Manual content analysis

Content, thematic, narrative, ethnographic, experimental, phenomenological, and biographical analysis are the widely use methods for the analysis of data (Silverman, 2016). Among them, Wahyuni (2012) has highlighted content analysis as one of the most common strategies to analyse qualitative data. It is prominently used to analyse text data and Kondracki and Wellman (2002) highlighted the variety of methods to collect qualitative data as interviews, open-ended questionnaires, focused group discussions, observations, and/or printed media. Further to the authors, text findings through the above methods are mainly available in print, verbal, and electronic formats. Content analysis can be manual or software-based.

The process of content analysis can be structured under eight (08) main steps (Datt & Chetty, 2016). According to the authors, preparation of data, defining units or themes for analysis, categorizing and coding, checking, pre-testing and reassurance of codes through a sample, complete coding process, ensuring the consistency of coded data, and development of writeup can be identified as the main steps.

This study adopts manual content analysis to analyse the findings of expert interviews to accomplish objectives 03 of the research. In order to be familiarized with the content of the research findings, the manual analysis has been selected as the collected data were manageable to handle manually.

3.7.2.2 Relative Importance Index

The questionnaire survey of this research targeted the collection of mathematical findings and accordingly, quantitative data analysis techniques were required to use. Since the questionnaire survey incorporated Likert scale questions, according to Sheskin (2003), both parametric and nonparametric tests can be used for the analysis. Accordingly, this study has used the Relative Importance Index (RII) calculations to aggregate the scores provided by the respondents on the Likert scale. The selection was based on the study of Holt (2013) which emphasizes the RII as a suitable analysis technique for Likert scale questions. Accordingly, Objective 04 of this research, which is to rank and prepare a matrix for the choice of ADR method(s) based on the risk

factors of construction projects was analyzed using RII. The findings provided the most critical ADR features simultaneously with the least impacted features (refer to section 4. 3.4). The formulae used for the calculation of RII values are indicated below.

$$RII = \frac{\sum w}{A \times N}$$

Where: RII= Relative Importance Index; w= Weighting given to each factor by the respondents, A= Highest weight and N= Total number of respondents.

3.8 Chapter Summary

This chapter described the research methodology used in this study. Accordingly, the research design from background identification to conclusions and recommendations was explained. The mixed research approach was used in the study. Survey Strategy with two (02) staged data collection using Stage 01- Expert interviews and Stage 02- Questionnaire Survey was conducted. Manual content analysis and the RII calculations were the two respective analysis methods followed.

CHAPTER FOUR

4 ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

Chapter three of this study describes the research methodology of this study in detail, whereas this chapter four provides research findings collected through the data collection process as described in the previous chapter. Thus, a mixed research choice is used to collect data under two stages. During the first stage, qualitative data were collected by conducting five expert interviews. Subsequently, under the second stage of data collection, a questionnaire survey was conducted following the results yielded from expert interviews. The findings of both expert interviews and questionnaire survey target to achieve the aim of this study, which is to investigate the suitable ADR method or methods based on risk factors of construction projects for successful dispute resolution in construction projects in Sri Lanka. Accordingly, this chapter will analyze the collected data and conclude the results of the data collection stages. At the end, the chapter summarizes how an ADR method(s) can be proposed at the initial stage of a project concerning risk factors of construction projects.

4.2 Findings and analysis of expert interviews

The data collection process of this study was initiated with expert interviews. Thus, five interviews were conducted with experts with more than ten (10) years of experience in using ADR methods and risk management in construction projects.

4.2.1 Objectives of the expert interviews

The expert interviews were carried out with the purpose of achieving following two objectives.

1. To investigate the risk factors that influence the selection of ADR method(s) within the Sri Lankan context
2. To develop a matrix by ranking ADR methods to identify the most suitable ADR method(s) based on risk factors to the Sri Lankan context

Further, the interviews were targeted to gather any additional risk factors applying to the construction projects that has not been gathered through a literature review but have an impact on the choice of an ADR method(s) as per the interviewee's experience and expertise. Moreover, data on the impact of any new risk factors were also gathered to develop the structured questionnaire for the next step of the data collection process of this study.

The 10 years of experience is used as criteria to choose an expert in this study, following the research result by Chase and Simon (as cited in Fazey, Fazey, & Fazey, 2005). According to Chase and Simon, one should require around 10 years to develop expertise as discussed in the educational literature. Followingly, the data collection was commenced under the selected criteria, and expert interviews were conducted subjected to the structured expert interview guideline (Appendix – A).

4.2.2 Expert interview guideline

A structured interview guideline was developed in three parts to gather expert knowledge. Accordingly, Part 01 focuses on the importance of this study; Part 02 focuses on risk factors that influence for the choice of ADR method(s) in the Sri Lankan context, whereas Part 03 targets to identify the impacts of filtered risk factors for the study by considering the characteristics of ADR methods. Thus, five expert interviews were conducted to yield the risk factors to be considered when proposing an ADR method to a project.

4.2.3 Respondent details of the expert interviews

The expert interviews were conducted with five experts with more than 10 years of experience in the use of ADR methods and risk management in construction projects in Sri Lanka. The purposive sampling method was used when selecting experts to collect more precise and reliable data. Table 4.1 summarizes the details of five experts.

Table 4.1: Respondent Details

Respondent	Respondent A	Respondent B	Respondent C	Respondent D	Respondent E
Designation	Senior Quantity Surveyor	Contracts Manager	Contract/ Claims Consultant	Quantity Surveyor/ arbitrator	Contract Administrator
Years of experience	27 years	16 years	23 years	17 years	15+ years
Experienced in use of ADR and Risk	Yes	Yes	Yes	Yes	Yes
Number of experience in use of ADR	13 years	10 years	20 years	12 years	11 years

4.2.4 Findings of the expert survey

The five respondents whose details are shown in Table 4.1 were interviewed following the interview guideline structured under three sections namely Part 01, Part 02, and Part 03. The findings of the interviews were summarized henceforth.

4.2.4.1 Finding on importance of this study (Part 01)

This section focused on identifying the importance of conducting this study while collecting information on current practice in Sri Lanka in selecting an ADR method.

Mechanisms followed to select an appropriate ADR method(s)

All the respondents emphasized that, when a dispute arises, they had followed the three-tiered dispute resolution mechanism firstly negotiation, then, if it fails, dispute adjudication board and finally arbitration as laid down in standard forms of contracts. According to the respondents, negotiation is promoted after an unsuccessful decision of the dispute adjudication board before referring the dispute to arbitration. However, respondent C stated, "There is no practice in Sri Lanka to go for negotiation when parties are dissatisfied on the decision of dispute adjudication board and the common practice is referring the case directly to arbitration". Respondent E expressed a similar view as respondent C. Further, respondents A, B and D emphasized that when it comes to government projects, the project team always tends to go with the ADR clauses

embedded in the form of contracts. Respondents reveal the reason behind that is the government's reluctance to implement new practices. Further to respondents, government projects always tend to use traditional practices and lag in implementing new practices, although such are beneficial.

Respondent E shared his personal experience with using an amended ADR clause in one of the power plant construction projects of the government. According to the respondent, the ADR process is to follow negotiation first, and then if negotiation fails, the Employer's secretary is authorized to provide a decision. If parties are dissatisfied with the secretary's decision, then parties can refer the dispute to Arbitration.

As explained by respondent E, the amended ADR process deviates from the traditional three-tiered ADR process because that clause replaced the dispute adjudication board by the employer's secretary. Respondent E's opinion on this change has quoted below.

“In my opinion, the amended ADR clause of my project is biased towards the Employer. That is because the secretary is working as an Employer's personnel and that position is not impartial. Because of that, in most of the cases, I have noticed that the decision given by the secretary is not at satisfactory level to the contractor”.

Further to the respondent E, the contractor of his project had referred dissatisfied cases to arbitration very rarely because of the huge cost and time embedded in the arbitration process. Therefore, respondent E stated,

“It is beneficial to draft new ADR clauses for each project after a proper analysis to make both parties satisfied. In my opinion, the ADR clauses do not always require sticking and being bound by the written clauses in the standard form of contracts.”

Influence of risk factors of construction projects for the choice of an ADR method(s) (Part 02)

All the respondents had positive feedback on this study, and according to them, this study is useful where the project team can implement the findings into practice to save

time, cost, and create good relationships among other project team members. Respondent C highlighted an issue in the ADR process in current practice as,

“Parties always tend to dishonour the decision from Dispute Adjudication Board and refer the case to arbitration since dispute adjudication board’s decision is not final. Because of this nature, the use of the dispute adjudication board as an ADR method has become a complete waste in most construction projects. That is because when parties refer the case to arbitration, then arbitration process opens that dispute as a completely new case disregarding the dispute adjudication board’s decision”.

Respondent C stated that if a study can address those issues, that would be useful to save time and cost spend on dispute resolution processes.

Further, respondent A suggested that a study like this can be promoted by presenting an impact analysis to the Employer. This includes an analysis of each ADR method's advantages and disadvantages and their benefits over other methods. The most suitable ADR method(s) to a particular project can be promoted rather than going with the ADR clause embedded in the Conditions of Contracts. Further, respondent A and respondent C believed that this study can only be implemented in Sri Lankan projects where an employer is a private entity since government projects are very reluctant to go beyond the traditional practice due to legal constraints. But they emphasized if this can be proposed to government projects as well, it will be beneficial and effective.

4.2.4.2 Applicable risk factors for the choice of an ADR method(s) (Part 03)

Part 03 of the expert interview guideline was structured to filter the risk factors of construction projects identified through the literature on the criteria of applicability for choosing an ADR method. The findings of the expert interview are represented in tabular form in Table 4.2

Table 4.2: The expert survey findings

No	Respondent Risk factors in construction projects identified through literature	Applicability of risk factors for the choice of an ADR method				
		Respondent A	Respondent B	Respondent C	Respondent D	Respondent E
1	Financial risks like construction cost overruns, financial failures, delayed payments	yes	yes	yes	yes	yes
2	Defective work	x	x	x	x	Yes
3	Technological risk; Technology changes	yes	yes	yes	yes	Yes
4	Changes in Laws and local standards, political risks	yes	yes	yes	yes	Yes
5	Time risk; scheduled delays	yes	yes	yes	yes	yes
6,7	Lack of availability of resources (material and lack of experience and skills)	x	x	yes	x	yes
8	Lack of communication and team collaboration	yes	yes	yes	yes	yes
9	Variations; Scope changes	yes	yes	yes	yes	yes
10	Environmental risks; weather and climatic issues, unknown geological and site conditions	yes	x	yes	x	yes
11	Economic changes; Inflation, tax	x	yes	x	x	x
12	Documents and information risk	yes	x	yes	yes	yes
13	Approval delays; Excessive procedures for statutory clearances and approvals	yes	yes	yes	yes	yes
14	Accidents at site	x	x	x	x	yes
15	Social risks; language barriers, various cultures	yes	yes	yes	yes	yes

The opinions of each respondent on the above risk factors, their applicability for the choice of an ADR method(s) and the impacts are described henceforth.

01. Financial risks

All the respondents agreed that financial risks of construction projects can directly cause effects like high-cost impacts to the project and negative relationships with project teams due to dissatisfactions. Indirectly, that can cause delays in construction projects.

An ADR method that is low in budget, which has third-party involvement (to address negative relationships and which consumes less time will be suitable. Respondent C emphasized that cost as risk can be seen from two perspectives in projects. According to respondent C, those two types are Employer's risk and Contractor's risk. Further, the respondent stated that financial risk would become a risk only for measure and pay contracts since, in fixed-term contracts, the cost is fixed. Therefore, such projects will not be bound by financial risks.

02. Defective work

According to respondents A and C, defective work can arise due to poor workmanship (Scarcity of skilled labor) or defective material. Further the respondents are of the opinion that the performance bond is available to minimize the risks arising due to defects. Therefore, this risk factor has no significant impact on choosing an ADR clause for a project. Respondent B and D were also of the same opinion that; this cannot be recommended for the choice of an ADR method as contracts itself has security bonds to cover up the risk of defective works. However, respondent E emphasized that this risk factor will affect the choice of an ADR method depending on the nature and magnitude of the defect. If the probability of defects arising is high in a project, then the respondent suggested going with a low cost, less time-consuming ADR method. However, the respondent stated this is not a significant risk factor since provisions are available in Conditions of Contract to secure impacts due to defects.

03. Technology

According to respondent A, this risk can arise in highly technical projects. Further, that can be due to changes in technology while the project is progressing or having the necessity of going for an alternative technology since the proposed technology is not workable and applicable to a given situation. Respondent A shared one of his experiences on a pipe laying project in the Colombo area. After commencing the work, the project team noted that the soil condition of the proposed project area was weaker than the expected soil condition. Because of that, the project team consulted an expert and introduced a cement and sand piling system for the project to facilitate the pipe playing works. Respondent A stated that,

“At the later stage in the project, many disputes were arisen and noticed that most were due to impacts of implementation of that new technology for pipe laying works. The ADR processes related to such disputes dragged into long durations and caused high-cost impacts to the projects”.

Respondent A believed that, one of the reasons for incurring high cost and time impacts was because of the absence of experts on using new technology during the ADR process.

According to respondents B, C, D and E, an ADR method that can use expert knowledge is more suitable for projects open to technological risks. Further, all the respondents believed this kind of risk factor could cause scope changes, cost impacts, delays and adaptability issues.

04. Changes in Laws

According to respondents A and D, there are provisions in the Conditions of a contract to overcome changes in-laws. However, when a project is running for a duration where laws are continuously changing, then the ADR method proposed should be a method that does not affect by law changes. A less formal process is more suitable where parties can mutually resolve disputes. According to respondent B, this impacts the cost and time due to disruptions in progressing the project. Respondent E is of the opinion that although this can cause cost and time impacts, this doesn't create negative relationships among parties since law changes are external and beyond parties' control. Further respondent A emphasized that flexible ADR methods areas more preferred for projects run at the risk of continuous law changes. Respondent A described the risk factor of changes in the law by bringing the pandemic of corona and its impact on the construction projects into the discussion. The pandemic of the corona is a force majeure event as per the Conditions of Contract, the cost of the event has to be borne by parties. Respondent A stated,

“However, the reality is that the cost incurred to Contractor is comparatively high when comparing the cost incurred to Employer. Therefore, Contractors tend to claim additional cost, but such claims did not receive approvals since

standard documents emphasized the cost of force majeure events are to be borne by both the parties, Employer and Contractor. However, disapproval of such claims leads to many disputes”.

Respondent A was in the viewpoint that; these disputes should be resolved flexibly with mutual understanding rather than framing to the standard documents. That will affect to the continuation of the project.

05. Time risk

All the respondents believe this risk is to be considered when choosing an ADR method(s). Respondent A stated that this risk is one of the most significant risks. Respondent supported it with the statement, “so far, I have not seen any project which doesn’t request time extensions during my practice”. Further, all the respondents were of the opinion that, except for time, this can cause cost impacts due to the involvement of prolongation cost and also negative relationships. Respondent C stated, “When time standing as the risk of the project, here our main aim should be resolving the disputes immediately”. Further, respondent D emphasized most of the project team members have less knowledge of analyzing time impacts. When thinking of an ADR method that can resolve a dispute faster than other ADR methods, it will be effective if that selected ADR method have the ability of using expert knowledge to the process.

06. Lack of availability of resources and 07. lack of Experience of skills

Only respondents C and E believed this risk has to focus on when proposing an ADR method for a project. According to respondents’ C and E, lack of availability of resources can be material, machinery, or labor scarcity. But machinery and labor fall under the contractor’s obligations and that has to be disregarded when considering this risk as a factor for proposing an ADR method. Since material risk is out of parties’ control, the respondents suggested going for an ADR method that is flexible, fair, and less time-consuming.

08. Lack of communication and team collaboration

All the respondents agreed that this risk has to consider when proposing an ADR method(s) to a project. Respondents A, D and E believed that third party involvement would be supportive for this kind of project. In contrast, respondent B suggested an ADR method that can give parallel decisions while the project is moving as more preferred. According to respondents' C and E, an ADR method that opens to share ideas will be more suitable.

09. Variations; Scope changes

All the respondents believed that variation can be considered a risk factor when proposing an ADR method or ADR methods for a project. If a project is more open to variations and if it is considered a risk, respondents agreed that this causes cost impacts, delays, and negative relationships among parties. Respondent C emphasized its best to go for a flexible and supportive ADR method. Supporting to that respondent D stated less formal ADR methods will be beneficial since parties can run the project with mutual understanding. Although time and cost is to be considered when proposing an ADR method for this kind of a risky project, flexibility and less formality should be considered overtime and cost.

10. Environmental risk

Only respondents A, C and E selected environmental risks as a risk factor that can be considered when proposing an ADR method to a project. All three respondents expressed applicability of this risk factor for this study depends on the nature of the project. According to respondents, infrastructure development projects are applicable for this kind of risk factor. Further, respondents highlighted when taking environmental risks in this study, it should ignore environmental issues like extreme weather situations which have provisions in the contract that can be addressed without leading negative impacts on projects. Respondent E shared his experience on a hydropower plant project. The experience had been received during the construction of an underground hydropower plant project including a dam construction in Sri Lanka. The main proposal has included to construct the project by blocking five

waterfalls. But due to not receiving the approvals from relevant environmental authorities, finally, the actual project was constructed by blocking only one waterfall. However, with the approvals, when the construction was in progress, the project team had found a species of snails that have identified 40 years ago as rare animals that have been announced under animals to be preserved in the law of Sri Lanka. The respondent E stated,

“Once we found the snails, we were advised by Environmental authorities to resettle those animals in a suitable environment. However, the said process took a considerable duration while incurring a large cost impact. Because of this, the project lagged behind the planned schedule, leading to many project disputes. When settling the disputes, we had to get an expert opinion to prove the excessive time and cost incurred are not because of the fault of the project team but because of the process laid on resettling those animals.”

With that statement, respondent E concluded, that expert knowledge is highly required to settle disputes for projects which has an impact on nature because not everyone has the expertise in environment-related areas.

Accordingly, all three respondents emphasized that this risk creates time and cost impacts the project. Further, respondents C and E expressed, that since the interaction of the third parties is high in projects which are more open to environmental risks, it is beneficial if the project team can go for an ADR method that supports to use of expert knowledge.

11. Economic changes

According to respondents A, C, D and E, this risk is addressed within the provisions of the contract. However, respondent B stated this can be applicable in situations where parties have not well addressed the project's economic changes, like not having well-prepared price fluctuation formulas. In such situations, according to respondent B, an ADR method which can provide an immediate resolution at a lower cost is preferred. However, this is not considered when compares to other risk factors.

12. Documentation errors

All the respondents except respondent B agreed that documentation errors can be considered a risk to be addressed when proposing an ADR method(s) to a construction project. When a project is more open to documentation errors, that can cause cost and time impacts, and negative relationships as per respondent's experiences. However, respondents were suggested to go for a formal method since, in practice parties are reluctant to accept documentation errors. Further, respondents D and E proposed it is better to have third-party involvement in this type of risky project.

13. Approval delays; Excessive procedures for statutory clearances and approvals

Respondent A stated that these risks can lead to delays and due to that cost impacts can be increased. According to the respondent, government authorities have lengthy approvals procedures, so projects are lagging behind the actual planned time. The other four respondents also provided similar opinions while proposing a fast and flexible ADR method(s) for a quick resolution of disputes.

14. Accident at Site

All respondents except respondent E believed this can be removed under the criteria of applicability for proposing an ADR method(s) to a construction project. Everyone expressed that the project team has insurance as a precaution for this kind of risk. However, respondent E believed that there are projects more open to accidents more formal ADR method(s) will be suitable, which can govern by the law since accidents can cause injuries to humans and damages to properties and types of machinery. Therefore, a method that can provide a binding decision will be more suitable to settle disputes effectively as per respondent E.

15. Social risk

All the parties chose social risk as a risk factor in projects that can govern the choice of an ADR method(s). Respondent B recommended using ADR methods, which allows professionals who can minimize social barriers in projects. Supporting that

respondent C stated that if the ADR method can use a third party who is best to address a given cultural issue, that would be effective. Further respondents A, C, D and E emphasized that time is a huge impact on projects open to social risks; therefore, an ADR method(s) that can provide hard and fast decisions is also more suitable. Further, respondent D emphasized the preservation of relationships; fairness and flexibility are also important when suggesting an ADR method(s) for projects open to more social risks.

Respondents suggested below the listed factors except for the above risk factors, which are also to be considered when proposing an ADR method(s) to a project.

- Type of the Employer (Government, International or private entity)
- Importance of the project – If the project is not considerably significant, then parties are reluctant to resolve the disputes but if a project is very significant, the situation is entirely different.
- Duration of the project (The ADR clauses applicable to 2 years projects are not suitable for 3 months projects)
- Is there a separate consultant or whether Employer's personnel present as a consultant?
- Procurement method used in the project
- Knowledge of the parties related to ADR - Some less people know about mediation and conciliation. Further, some arbitrators are from different professions, and they cannot understand the dispute

However, when looking into the above factors, it can be noted that all the above factors cannot be considered risk factors. Therefore, it can conclude that except for the identified risk factors in the literature, none of the additional risk factors were suggested by experts.

As this data collection was conducted under controlled parameters of; experts who have more than 10 years' experience in both ADR and risk management in construction projects, the majority decision is considered in filtering the most significant risk factors.

According to the Oxford dictionary (2000), the majority is defined as “the largest part of a group of people or things”. Accordingly, the risk factors where majority of the interviewees agreed on were taken forward to the next stage of data analysis to achieve the aim of this study.

1. Financial risks like construction cost overruns, financial failures, delayed payments
2. Technological risk; Technology changes
3. Changes in Laws and local standards, political risks
4. Time risk; scheduled delays
5. Lack of communication and team collaboration
6. Variations; Scope changes
7. Environmental risks; weather and climatic issues, unknown geological and site conditions
8. Documents and information risk
9. Approval delays; Excessive procedures for statutory clearances and approvals
10. Social risks; language barriers, various cultures

4.3 Findings and analysis of the questionnaire survey

The questionnaire survey of the study was construed based on expert interview findings. A quantitative research approach was utilized in this questionnaire survey. Thus, a questionnaire structured with 5 points Likert scale and a survey was conducted with thirty-four (34) experts in the construction industry under the purposive sampling method. The survey targeted to rank the ADR methods in the Sri Lankan construction industry under risk factors those which were identified through the expert survey as risk factors that affect the choice of an ADR method for a construction project. For that, the collected data were analyzed using the Relative Importance Index (RII) using Microsoft Excel spreadsheet software.

4.3.1 The objective of the questionnaire survey

This questionnaire survey was targeted to achieve the fourth objective: to develop a matrix by ranking ADR methods to identify the most suitable ADR method(s) based on risk factors to the Sri Lankan context.

4.3.2 Structured Questionnaire

The structured questionnaire format (Appendix – B) was arranged under two sections, Section A and Section B. Section A was arranged to collect the details of the respondents, where Section B was arranged to collect respondent's judgement on level of importance of each ADR method with respect to identified 10 number of risk factors. The questionnaire was structured with 10 questions where respondents were invited to mark their judgement under a 5-point Likert scale.

This questionnaire survey was performed along with well qualified, experienced and knowledgeable professionals and experience in dispute management, dispute resolution and risk management in the construction industry.

4.3.3 Details of questionnaire respondents

The structured questionnaire of this study was conducted along with 34 respondents selected purposively based on the two criteria. Thus, respondents who satisfy two criteria; (i) respondents having at least 10 years' experience in their profession to assure that the respondent is aware on construction risk factors and its behaviors and (ii) having at least 5 years' experience with dispute resolution, to ensure that the respondent is aware of characteristics, advantages, disadvantages, and process of each ADR methods used in the construction industry were considered for the study. With respect to the above two criteria, the selected respondents were from quantity surveying, engineering, and legal backgrounds.

The questionnaire survey was begun by distributing 40 questionnaires to selected respondents. As shown in Figure 4.1, out of 40 questionnaires, 34 responses were received.

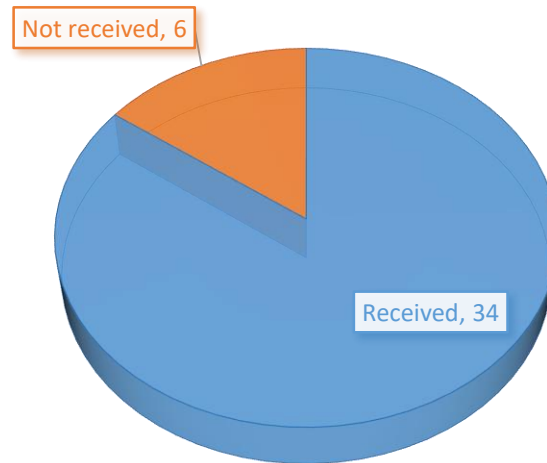


Figure 4.1: Rate of response questionnaire survey

Flowingly, the analysis of the questionnaire survey findings was done based on those 34 questionnaires. RII technique is used to analyze the findings.

4.3.4 Analysis and findings of the questionnaire survey

Through the questionnaire survey, each risk factor which was pre-identified and filtered as risk factors that govern the choice of an ADR method/ methods were analyzed along with available ADR method in the construction industry in Sri Lanka and such ADR methods were ranked against their level of importance in terms of managing each risk factor. The findings were described henceforth under the heading of each risk factor.

1. Financial risk

Financial risk is one of the risk factors chosen by experts as a risk factor that can affect the choice of an ADR method. Through the literature findings and expert survey findings, it was identified that if the financial risk is the most significant risk factor in a construction project, an ADR method which is the lowest cost will be suitable. ADR methods used in the Sri Lankan construction industry were ranked concerning for the findings from the questionnaire survey as shown in Table 4.3.

Table 4.3: Importance of ADR methods against financial risk

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	33	0	0	0	1	0.97647	1
2	Mediation	0	13	12	8	1	0.61765	2
3	Conciliation	0	9	18	5	2	0.60000	3
4	Adjudication	1	7	4	18	4	0.50000	4
5	Arbitration	2	1	3	6	22	0.33529	5

The findings revealed that negotiation (RII = 0.976) is the best ADR method for a project when financial risk acts as the most significant risk factor. The findings ranked the other four ADR methods according to the level of importance in terms of addressing the financial risk as mediation (RII = 0.618), conciliation (RII = 0.600), adjudication (RII = 0.500), and arbitration (0.335) respectively. According to the results, it can be noted that the respondents have identified arbitration as an ADR method that is not to use when a project is under financial risk. Further, negotiation is identified as the most suitable ADR method and the RII value of negotiation is nearly three times higher than the value received for the arbitration

2. Technological Risk

The expert survey identified that when a project is more technical and technological risk is acting in that project as the most significant risk factor, an ADR method that can use expert knowledge will be suitable. With respect to that expert survey finding, ADR methods in the Sri Lankan construction industry had been ranked by the respondents during the questionnaire survey, as shown in Table 4.4

According to the findings, negotiation (RII = 0.806) is the most suitable ADR method, whereas adjudication (RII = 0.694) is the next best ADR method for a project where technical risk acts as the most significant risk factor in the project. Conciliation (RII = 0.659), mediation (RII = 0.524) and arbitration (RII = 0.429) are identified as next best options respectively. The findings proposed using negotiation, adjudication, and

conciliation in a project run under technical risk rather than mediation and arbitration as per RII values.

Table 4.4: Importance of ADR methods against technological risk

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	18	6	5	3	2	0.80588	1
2	Mediation	3	5	9	10	7	0.52353	4
3	Conciliation	1	12	17	4	0	0.65882	3
4	Adjudication	10	8	9	2	5	0.69412	2
5	Arbitration	2	5	5	6	16	0.42941	5

3. Risk on changes in policies, rules and regulations

The expert survey found that, if a project is running for a duration where policies, rules and regulations are continuously changing, and the risk of changes in policies, rules and regulations is the most significant risk factor in a construction project, then an ADR method which does not affect by policies and regulation changes is most suitable. In fact, the expert opinion was that a less formal process is more suitable where parties can mutually resolve disputes. The respondent's opinion on the above fact is shown in Table 4.5.

Supporting that, the findings prove negotiation (RII = 0.835) is the most suitable, whereas conciliation (RII = 0.682) and Mediation (RII = 0.647) are the next suitable ADR methods to incorporate into a project. The result marked adjudication (RII = 0.500) as the fourth-best ADR method out of five ADR methods by marking arbitration (RII = 0.335) in the fifth position as per ranking. The findings prove that the first and second significant ADR methods, negotiation and conciliation, are more than two times more effective than arbitration in a project where the risk of changes in policies, rules, and regulations acts as the most significant risk factor in that project.

Table 4.5: Importance of ADR methods against risk on changes in policies, rules, and regulations

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	16	10	7	0	1	0.83529	1
2	Mediation	3	11	12	7	1	0.64706	3
3	Conciliation	3	12	16	2	1	0.68235	2
4	Adjudication	1	6	6	17	4	0.50000	4
5	Arbitration	1	3	0	10	20	0.33529	5

4. Time risk (Risk on Project duration)

The expert survey filtered risk on project duration as a significant risk factor to consider when proposing an ADR method/ methods for a construction project. Both Expert survey and literature review findings prove that, if time is the most significant risk factor in a construction project, an ADR method that can resolve a dispute faster is suitable. Followingly, the questionnaire survey proves negotiation (RII = 0.953) is the most suitable ADR method to implement on such projects. It can be noted that negotiation is nearly two times more useful than the fourth-ranked ADR method, adjudication (RII = 0.488) whereas negotiation is nearly three times more useful than fifth-ranked ADR method, arbitration (RII = 0.324) for a project run within the critical risk on project duration as per RII values shown in Table 4.6.

Table 4.6: Importance of ADR methods against risk on project duration

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	27	6	1	0	0	0.95294	1
2	Mediation	2	17	10	4	1	0.68824	2
3	Conciliation	1	10	18	4	1	0.63529	3
4	Adjudication	1	4	9	15	5	0.48824	4
5	Arbitration	2	1	0	10	21	0.32353	5

According to the results, mediation (RII = 0.688) and conciliation (RII = 0.635) are the second and third best suitable ADR methods when a project runs on time risk making that the most significant risk of that project.

5. Risk on lack of communication and team collaboration

Risk of lack of communication and team collaboration is also identified during the expert survey as a risk factor that could determine a suitable ADR method/ methods for a construction project. Accordingly, it was identified that if the risk of lack of communication and team collaboration is the most significant risk factor in a construction project, an ADR method where third-party involvement presence and parties allow to share ideas is more suitable. As per questionnaire survey findings on the above risk, as shown in Table 4.7, both mediation and adjudication (both have RII = 0.676) are the most suitable ADR methods out of the listed five ADR methods in the considered context. It can be noted that conciliation (RII = 0.671) is also considered significant in addressing the aforementioned risk. According to the respondent's opinion, negotiation (RII = 0.506) is placed in the fourth place per ranking and arbitration (RII = 0.418) is placed in the last place per ranking.

Table 4.7: Importance of ADR methods against lack of communication and team collaboration

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	3	9	4	5	13	0.50588	4
2	Mediation	5	10	12	7	0	0.67647	1
3	Conciliation	6	7	15	5	1	0.67059	3
4	Adjudication	6	11	9	6	2	0.67647	1
5	Arbitration	4	1	4	10	15	0.41765	5

In general, it can be noted that RII values resulting above for five ADR methods do not depict a significant variance. Therefore, it that concludes all the five ADR methods are at an acceptable level to propose for a project which has a risk of lack of communication and team collaboration as the significant risk of the selected project.

6. Risk on variations in respect of scope changes of the project

Risk on variations in respect of scope changes of the project as another risk factor that can use in proposing an ADR method/ methods to a project identified during the expert survey is considered for the analysis below. As per expert survey findings, if a project is more open to variations in respect of scope changes of the project and if that is the most significant risk factor of a construction project, an ADR method that is less formal and supportive will be suitable since then parties can run the project with mutual understanding. Accordingly, the received data during the questionnaire survey were analyzed. The analysis ranked the five ADR methods as shown in Table 4.8. It can be noted that negotiation (RII = 0.894) is the most suitable ADR method for a project where the aforementioned risk is associated as the most significant risk factor. Further, it can be seen that mediation (RII = 0.700) and conciliation (RII = 0.665) are also significant for the considered situation rather than proposing the adjudication (RII = 0.494) and arbitration (RII = 0.324) which are set in the fourth and fifth rank respectively as per findings.

Table 4.8: Importance of ADR methods against risk on variations in respect of scope changes of the project

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\Sigma N = 34$)	RANK
1	Negotiation	21	9	3	1	0	0.89412	1
2	Mediation	3	15	12	4	0	0.70000	2
3	Conciliation	1	14	15	3	1	0.66471	3
4	Adjudication	0	4	12	14	4	0.49412	4
5	Arbitration	1	0	4	9	20	0.32353	5

As per the RII values depicted in Table 4.8, the negotiation, mediation, and conciliation which are placed in the first, second, and third place as per ranking are more than two times significant as using arbitration for a project which has risk of variation as the most significant risk out of other available risk factors. On the above-ground, arbitration can be marked as a less suitable ADR method for a project run on the discussed risk factor.

7. Environmental related risk

An environmental-related risk is being identified through the literature review as a significant risk factor for any kind of project. Flowingly, the expert survey filtered this risk as a risk factor that can impact the choice of an ADR method(s). Further, it revealed that, if a project is more open towards environmental-related risks. Environmental risk is the most significant risk factor of a construction project, an ADR method that supports to use of expert knowledge for the settlement of environment-related disputes is suitable since external party involvement is high in such projects (like Central environmental authority, Urban development authority, etc.).

Accordingly, the conducted questionnaire survey data ranked the five ADR methods concerning for environmental risk as shown in Table 4.9. The result shows that conciliation (RII = 0.706) is the most significant of the five ADR methods to the considered situation. It can be noted, that adjudication (RII = 0.700) being the second significant ADR method as per ranking, is also convenient for proposing for the considered situation same as conciliation since both conciliation and adjudication have received nearly similar RII values. Therefore, it demonstrates the respondent's preference is either conciliation or adjudication for a project run open to environmental risk as to the most significant risk for the project. According to the level of importance of addressing the given risk, mediation (RII = 0.641), arbitration (0.547), and negotiation (RII = 0.494) are in third, fourth, and fifth place as per ranking. However, it can be noted that all ADR methods have a considerable RII value meaning that all five ADR methods are at an acceptable level to propose for a project which runs on the risk as to the most significant risk of that project.

Table 4.9: Importance of ADR methods against environmental related risk

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	3	6	7	6	12	0.49412	5
2	Mediation	5	7	13	8	1	0.64118	3
3	Conciliation	9	8	10	6	1	0.70588	1
4	Adjudication	5	16	5	7	1	0.70000	2
5	Arbitration	6	6	6	5	11	0.54706	4

8. Risk on documentation errors

It was identified that the risk of documentation errors is also an applicable risk factor for proposing an ADR method / ADR method to a project. Accordingly, the expert survey findings showed that if a project is more open to the risk of documentation errors and that risk is the most significant risk factor of a construction project, an ADR method that is more formal that provides binding decisions is suitable since, in practice, parties are reluctant to accept documentation errors.

Accordingly, the five ADR methods used in the Sri Lankan construction industry are analyzed based on the data collected through a questionnaire survey against the risk of documentation errors, and the result is depicted in Table 4.10. Arbitration has received the highest RII value (RII = 0.806), marking it as the preferred ADR method for the selected risk factor. Further, arbitration is two times as important as the last significant ADR method, negotiation (RII = 0.400). Adjudication (RII = 0.712) can be identified as the second-best ADR method for the selected risk situation where conciliation (RII = 0.547) and mediation (RII = 0.465) are the next options respectively as per the ranking.

Table 4.10: Importance of ADR methods against risk on documentation errors

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	3	2	2	12	15	0.40000	5
2	Mediation	0	2	10	19	3	0.46471	4
3	Conciliation	0	7	15	8	4	0.54706	3
4	Adjudication	6	13	10	4	1	0.71176	2
5	Arbitration	17	9	3	2	3	0.80588	1

So far, eight risk factors were analyzed based on the questionnaire survey findings and all the results have placed the arbitration either in the fourth or fifth place as per ranking. This risk situation can be determined as an important event to consider if it appears in a project as the most significant risk factor because this marked the arbitration as the best ADR method to propose for such projects.

9. Risk on excessive procedures for statutory clearances and approvals

(Approval delays)

According to the expert survey findings, if a project is more open to the risk of excessive procedures for statutory clearance and approvals and if that risk is the most significant risk factor in a construction project, then a fast ADR method that can provide quick decisions will be more suitable. For that, the data collected through the questionnaire survey were analyzed and the findings are shown in Table 4.11.

Table 4.11: Importance of ADR methods against risk on excessive procedures for statutory clearances and approvals (approval delays)

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	19	11	3	1	0	0.88235	1
2	Mediation	2	17	9	4	2	0.67647	2
3	Conciliation	1	9	17	6	1	0.61765	3
4	Adjudication	2	3	9	16	4	0.50000	4
5	Arbitration	1	2	3	9	19	0.34706	5

According to the RII values, the negotiation (RII = 0.882) is the most suitable ADR method for the considered risk situation. Subsequently, the mediation (RII = 0.676), conciliation (RII = 0.618), adjudication (RII = 0.500) and arbitration (RII = 0.347) are important respectively to address the risk of excessive procedures for statutory clearances and approvals as per findings. RII value of the negotiation is considerably higher than RII values owned to other ADR methods, and it is more than two times higher than the RII value owned to the arbitration.

10. Social risk

Most researchers identify social risk as an important risk factor for any kind of project including construction projects. Thus, expert survey filters risk on social facts can impact a proposing an ADR method / ADR method to a construction project. The expert survey found that if a project is open to risk on social issues and social risk is the most significant risk factor in a construction project, then an ADR method which can use a third party who is best to address a given social issue is suggested as effective.

The five ADR methods against the risk of social risk are being analyzed by referring to the questionnaire survey findings as shown in Table 4.12.

Table 4.12: Importance of ADR methods against social risk

S/ No	ADR methods used in Sri Lankan Construction Industry	N of W = 5	N of W = 4	N of W = 3	N of W = 2	N of W = 1	RII Value ($\sum N = 34$)	RANK
1	Negotiation	11	13	5	1	4	0.75294	1
2	Mediation	5	14	10	3	2	0.70000	3
3	Conciliation	8	13	9	4	0	0.74706	2
4	Adjudication	1	7	9	14	3	0.53529	4
5	Arbitration	4	1	6	8	15	0.42941	5

As per the findings, negotiation (RII = 0.753), conciliation (RII = 0.700), mediation (RII = 0.747), adjudication (RII = 0.535) and arbitration (RII = 0.429) are important respectively in addressing the captioned risk factor. It can be noted negotiation, conciliation and mediation have a considerably similar levels of significance since the RII values of these ADR methods are slightly similar compares to the values received for adjudication and arbitration. Further, it can be noted that there is no major variance in RII values between adjudication and arbitration as well although the values are varied from the first three ranked ADR methods. On the aboveground, all five ADR methods can be noted as viable options to propose for a project run on social risks because social risk is the most significant risk out of other risk factors.

The summary of findings of the questionnaire survey has demonstrated in Table 4.13. The matrix in Table 4.13 achieves the aim of the study.

Table 4.13: Matrix on the choice of ADR method(s) based on risk factors of construction projects

Risk factors \ ADR methods	Negotiation	Mediation	Conciliation	Adjudication	Arbitration
01. Financial risks	1 (RII = 0.976)	2 (RII = 0.618)	3 (RII = 0.600)	4 (RII = 0.500)	5 (RII = 0.335)
02. Technological Risk	1 (RII = 0.806)	4 (RII = 0.524)	3 (RII = 0.659)	2 (RII = 0.694)	5 (RII = 0.429)
03. Risk on changes in policies, rules, and regulations	1 (RII = 0.835)	3 (RII = 0.647)	2 (RII = 0.682)	4 (RII = 0.500)	5 (RII = 0.335)
04. Time risk (Risk on Project duration)	1 (RII = 0.953)	2 (RII = 0.688)	3 (RII = 0.635)	4 (RII = 0.488)	5 (RII = 0.324)
05. Risk on lack of communication and team collaboration	4 (RII = 0.506)	1 (RII = 0.676)	3 (RII = 0.671)	1 (RII = 0.676)	5 (RII = 0.418)
06. Risk on variations in respect of scope changes of the project	1 (RII = 0.894)	2 (RII = 0.700)	3 (RII = 0.665)	4 (RII = 0.494)	5 (RII = 0.324)
07. Environmental related risk	5 (RII = 0.494)	3 (RII = 0.641)	2 (RII = 0.706)	1 (RII = 0.700)	4 (RII = 0.547)
08. Risk on documentation errors	5 (RII = 0.400)	4 (RII = 0.465)	3 (RII = 0.547)	2 (RII = 0.712)	1 (RII = 0.806)
09. Risk on excessive procedures for statutory clearances and approvals (Approval delays)	1 (RII = 0.882)	2 (RII = 0.676)	3 (RII = 0.618)	4 (RII = 0.500)	5 (RII = 0.347)
10. Risk on social risk	1 (RII = 0.753)	3 (RII = 0.700)	2 (RII = 0.747)	4 (RII = 0.535)	5 (RII = 0.429)

4.4 Discussion

In this section the result summarized in the matrix in Table 4.13 will be discussed along with the available literature and real data to state the validity of the research findings. Figure 4.2 concludes the summary of the findings of this study by representing which ADR method(s) is(are) most suitable for the construction projects in Sri Lanka once risks associated with such projects are considered as a criterion to choose an ADR method(s). According to the research findings, negotiation is the most suitable ADR method out of the five ADR methods analyzed within the research. Secondly, mediation is considered as important over conciliation as conciliation is ranked in third place out of five ADR methods. According to the results, adjudication is to be chosen fourth place and arbitration is to be chosen last as ADR method(s) for a construction project. Although the expert survey proved that it is a tendency to go to arbitration over other ADR methods as its decision is final, this study concludes arbitration should not be the best choice for dispute resolution in the construction industry.

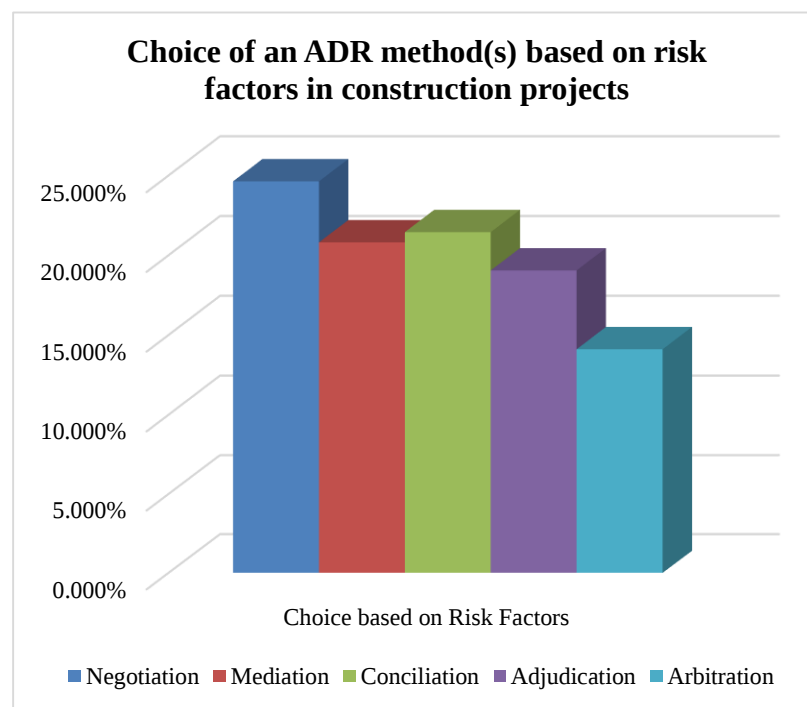


Figure 4.2: Choice of an ADR method(s) based on risk factors in construction projects

The findings for the criteria to select the most appropriate ADR method(s) based on the risk factors of construction projects have portrayed similar arguments to the studies of Chan, Suen, and Chan (2006), and Keršulienė et al. (2010). Thus, time, cost, and preservation of relationships have been identified as the common positive attributes. Furthermore, Illankoon et al. (2019) emphasized factors affecting the selection of ADR method(s) in Sri Lanka, and considered time is the most important feature, while cost and stakeholder relationships are highlighted least important.

Specifically, the unique finding revealed in this study is the identification of dispute adjudication as a complete waste in construction projects. Accordingly, parties tend to dishonor the adjudication board's decision. This is in contrast with the findings of Saeb et al. (2018), which highlight adjudication as a highly used construction activity.

The empirical findings of this research prove the view of Jayasena and Kavinda (2011), which illustrated negotiation as the most preferred choice for dispute resolution. This study validated the argument from the context of risks and emphasized negotiation as the proven method for the selection of ADR method(s) based on risk factors. However, the expert survey findings revealed that the widely used ADR methods in construction practice are dispute adjudication board or arbitration. The research findings reveal that, both two methods are not suitable to practice in construction projects in terms of risk factors embedded in projects

The empirical findings have disclosed negotiation and conciliation as the most appropriate methods to handle financial risks. Similarly, as per the study of Abeynayake (2014), it is feasible in terms of cost to be selected as an ADR technique. If the findings of the two studies deviated, even though the particular ADR method identifies the financial risk, the implementation cost of the ADR method tends to exceed the risk of the finance. Both studies confirm negotiation as a suitable technique to manage risks associated with time in a lesser duration. However, contradictory views were established on mediation. Accordingly, despite mediation being a feasible ADR method to resolve time related risks, according to the study by Abeynayake (2014), it is a time consuming process, which eliminates the benefit of saving time through risk identification. More specifically, the same author illustrated negotiation

as the most flexible method, which preserves relationships. However, the empirical findings convey negotiation as the least suitable method (with a rank of 04 out of 05), to handle risks associated with communication of parties and team collaboration.

Further, though the literature states that, conciliation is the least suitable method to resolve disputes in terms of ADR characteristics such as time, cost, confidentiality, flexibility, and enforceability (Abeynayake, 2014), conversely, in this context, conciliation is more suitable than adjudication and arbitration in terms of addressing risk factors associated in construction projects. However, according to the factors exposed by Abeynayake (2014), conciliation is the least suitable method when considering time, cost, confidentiality, flexibility, and enforceability. Conversely, in this context, conciliation is more suitable than adjudication and arbitration to manage risk factors. This can be because of the less awareness of conciliation within the industry as highlighted in the research by Abeynayake (2014).

Overall, based on the critical factors of selecting the ADR method(s), Arbitration has occupied the highest importance, while conciliation is the lowest. However, when risk factors have embedded in the criteria of selection, Negotiation is the best method and arbitration is the lowest.

4.5 Chapter summary

This chapter discussed data gathering, data analysis, and findings of the research to achieve the objectives of this research. The expert survey interviews were analyzed to filter the risk factors of the construction projects identified through a literature review in the Sri Lankan context. Further, the filtered risk factors were re-analyzed on the criteria of risks that have an impact on the choice of an ADR method(s) while discussing the impacts of such risk factors. Subsequently, the questionnaire survey was executed to achieve the final objective of this study. The questionnaire survey, which was conducted under the Likert scale, analyzed the most suitable ADR method(s) based on risk factors of construction projects.

The results have ranked the suitable ADR method(s) based on risk factors. Based on the results yielded by the questionnaire survey, a matrix was developed which depicts

the suitable ADR method (s) with respect to risk factors. This concludes the aim of this study, to investigate the suitable ADR method(s) based on risk factors of construction projects for successful dispute resolution in construction projects in Sri Lanka. Finally, the result findings were discussed concerting existing literature.

CHAPTER FIVE

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter four disclosed the data analysis and research findings of the research. In this chapter five, the objectives of the research will be revisited while presenting how the research objectives have been achieved during the research process. Subsequently, the chapter discusses contribution to knowledge and implications pertaining to research findings. Then, the chapter presents the recommendations and further research areas. Finally, the chapter presents the general conclusion of the study.

5.2 Revisiting objectives

Objective 01 - To identify the available ADR methods in the construction industry globally and with reference to Sri Lanka

The first objective of this study was achieved through a comprehensive literature review. Thus, available literature on ADR methods in the global context was explored. Further, the ADR methods in the Sri Lankan context were also reviewed. Accordingly, the literature proves that negotiation, conciliation, mediation, adjudication, arbitration and hybrid models such as Mediation-Arbitration are the ADR method(s) available in the global context. Out of such ADR method(s), it was noted that negotiation, mediation, conciliation, dispute adjudication board and arbitration are widely using in the construction industry of Sri Lanka as ADR method(s).

Objective 02 – To investigate the risk factors in construction projects in the global context

The second objective of this study was also achieved through the comprehensive literature review. The risk factors in construction projects were explored from the viewpoint of the Employer and the Contractor to the construction projects. Hence, 15 risk factors were collected as applicable for the study. The identified risk factors in construction projects are; financial risks like construction cost overruns, financial failures, delayed payments, risk due to defective works, technological risk, changes in laws and standards, time risk, lack of availability of resources, lack of experience and

skills, communication risks, scope changes, environmental risks, economic changes, information risks, delays in approvals, accidents at sites and social risks.

Objective 03- To investigate the risk factors that influence the selection of ADR method(s) within the Sri Lankan context

Objective three of this study was to investigate the risk factors that have an impact to the choice of ADR methods within the Sri Lankan context. The expert survey was designed by targeting 5 experts in the construction industry in Sri Lanka under the purposive sampling method. 10 numbers of risk factors out of 15 numbers of risk factors were selected from expert survey as the most appropriate risk factors that can influence to the selection of an ADR method(s). Hence, financial risk, technological risk, changes in law, time risk, lack of communication, scope changes, environmental risks, information risk, approval delays and social risk are identified as applicable risk factors for this study. After filtering the most appropriate risk factors which have impacts towards the choice of ADR methods, the impacts were gathered from the experts and carried forward to design the questionnaire survey which is the second stage of the data collection of this study.

Objective 04- To develop a matrix by ranking ADR methods to identify the most suitable ADR method(s) based on risk factors to the Sri Lankan context

Centering on the expert survey findings, a structured questionnaire was designed under the Likert scale aiming RII data analysis technique. The questionnaires were distributed to 40 respondents under purposive sampling and 34 questionnaires out of 40 numbers were received with respondents' opinions. The collected questionnaire survey data was analyzed through RII. The results ranked the ADR methods under each risk factor. Flowing the findings, a matrix was designed to select an ADR method(s) based on risk factors for construction projects in Sri Lanka. The matrix depicts negotiation is the most suitable ADR method in terms of risk factors of construction projects in Sri Lanka, where conciliation, mediation, dispute adjudication board and arbitration are suitable respectively.

In consequence, the four objectives of this research were achieved. Thus, the aim of the research, “to investigate the suitable Alternative Dispute Resolution method(s) based on risk factors for successful dispute resolution in construction projects in Sri Lanka” was accomplished.

5.3 Recommendations

According to the literature, there is a variety of ADR methods used in the construction industry in the global context. However, the research studies conducted within the Sri Lankan context reveal that negotiation, mediation, conciliation, dispute adjudication board, and arbitration are widely used ADR methods in Sri Lankan construction projects. Further, the research findings have proven that it is wise to consider risk factors when choosing an ADR method(s) for construction projects.

According to expert interviews, parties to construction projects always tend to follow the ADR mechanisms laid in the Standard Conditions of Contract documents. Therefore, it is rare to see any deviated ADR clauses in current construction practices. However, the experts are also of the opinion that it is beneficial to draft ADR clauses after a proper analysis.

The proposed matrix on the choice of an ADR method(s) based on risk factors proves that although the current industry practice is always to go for arbitration (findings of the expert survey), the best ADR method to resolve a dispute is negotiation. Further, the matrix demonstrates that arbitration is the least applicable ADR method in terms of risk. Following the research findings, the proposed matrix can be recommended for parties to study as a new area to observe when drafting ADR clauses for construction projects. Thus, parties can use the matrix during the initial stage of projects where parties are conducting risk analysis. Thus, the project team can identify the most applicable ADR method(s) to the project based on the significant risk factors identified for the project. The application of the research findings will be beneficial to the project team for successful project delivery.

5.4 Further Research

The following areas can be suggested for further studies.

1. The risk factors are studied here in terms of the Employer's and the Contractor's perspectives. Therefore, the study can be further analyzed based on impacts concerning the stakeholders of construction projects.
2. During the research, it was noted that studies are lacking on the risks of ADR methods. Therefore, a study can be conducted to explore risks embedded in ADR methods and the findings can be used to suggest the best ADR method(s) in terms of risk of ADR methods. As this research used project risk factors to suggest the appropriate ADR method(s).

5.5 Concluding Remarks

This research study significantly overviews the risk factors of construction projects from the perspective of the Employer and the Contractor and how such risk factors can be affected the choice of an ADR method(s) for a successful dispute resolution. The literature review highlights negotiation, mediation, conciliation, dispute adjudication board, and arbitration as widely used ADR methods in construction projects in Sri Lanka. However, the expert survey proves that negotiation, dispute adjudication board, and arbitration are the most practicing ADR method(s) in construction projects in Sri Lanka. Further to the experts, most of the time, the dispute resolutions are ended up with an arbitration process. Arbitration is to become the destination of most disputes, is because its decision is final and binding by the law of Sri Lanka. However, the expert survey findings reveal that it is required to analyze and propose ADR methods for construction projects rather than always following the standard methods. Accordingly, the current research identified that risk factors of construction projects can be looked in the perspective of choosing the ADR method(s). Thereby, the findings disclose that negotiation is the best ADR method to follow in dispute resolution, and conciliation, medication, dispute adjudication board, and arbitration are to follow respectively. The results were recommended that noticeable attention is to be given by parties in dispute resolution to follow negotiation as much as possible as it can be beneficial to the successful delivery of the project.

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APPENDIX A & APPENDIX B

EXPERT SURVEY GUIDELINE

H.N.M. Hapuarachchi,
Department of Building Economics,
University of Moratuwa.

.....

Dear Sir/Madam,

Conducting an Interview for Dissertation

I am a student of M.Sc in Construction Law and Dispute Resolution of Department of Building Economics, University of Moratuwa. I'm currently conducting a research on the topic of **“suitability of alternative dispute resolution methods based on risk factors to the Sri Lankan construction industry”** with the aim of investigating the suitable ADR method(s) based on risk factors of construction projects for successful dispute resolution in construction projects in Sri Lanka

In this regard, this expert survey is focused to validate the applicability of the risk factors identified in the literature to the Sri-Lankan context and filter the risk factors based on the criteria of which have an impact for the choice of ADR methods. In order to achieve the aforementioned objective, I would like to interview you for **approximately 30 – 45 minutes**. The medium of collecting data will be **note taking and tape recording (with the permission of the interviewee)** in order to ensure the accuracy and reliability of the collected data.

I strongly believe that you would support to this research by providing your views related to my research topic. **The information collected through this interview will be kept strictly confidential and should be used only for the purpose of the dissertation. Any of your personnel information will not be disclosed within the research.**

Thanking you in advance in anticipation of your kind collaboration.

Yours faithfully,
H.N.M Hapuarachchi
Student of M.Sc in CLNDR,
De

Supervisor:

Prof. (Mrs.) Udayangani Kulatunga,
Senior Lecturer,
Department of Building Economics,
University of Moratuwa

Date of the Interview :

INTERVIEWEE INFORMATION

Designation :

Years of Experience in construction industry :

Years of experience with ADR in construction industry:

What are the ADR methods you have dealt with :

INTERVIEW QUESTIONS

Part 01 – Importance of this study

- A. Have you followed any mechanism to select a proper ADR method or ADR methods when a disputable event is arisen in construction project you currently working with or worked with?

.....
.....

- B. What is your opinion on using risk factors for proposing an ADR method or ADR methods to a construction project?

.....
.....

Part 02 - Risk factor for the choice of an ADR method to Sri Lankan context

- A. Please mark the risk factors applicable to the Sri-Lankan context which can make an impact for the choice of an ADR method (Strikethrough any risk factors which are not relevant for the choice of an ADR method in Sri-Lankan context)?

Example: 1. Cost risk - Financial risks of construction projects can directly cause effects like high cost impacts to the project, negative relationships with project teams due to dissatisfactions. Indirectly, that can cause delays to construction projects. In fact, an ADR method which is low budget, third party involvement available (to address negative relationships), less time consume will be suitable. **Therefore, Cost risk can use for the choice of an ADR method**

1. Financial risks like construction cost overruns, financial failures, delayed payments
2. Defective work
3. Technological risk; Technology changes
4. Changes in Laws and local standards, political risks
5. Time risk; scheduled delays
6. Lack of availability of resources (material and lack of experience and skills)
7. Lack of communication and team collaboration
8. Variations; Scope and design changes
9. Environmental risks; weather and climatic issues, unknown geological and site conditions
10. Economic changes; Inflation
11. Documents and information risk
12. Excessive procedures for statutory clearances and approvals
13. Accidents at site
14. Social risks; language barriers, various cultures

B. With reference to your experience in dispute resolution in construction industry, please indicate any other risk factors which can use for the choice of an ADR method in Sri Lankan context that have not identified from the literature review?

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Part 03 – Mapping risk factors with ADR methods in Sri Lanka

A. The literature review conducted for Sri Lanka proves that the following ADR characteristics can make a choice on ADR in Sri Lanka.

- | | |
|------------------------------------|---|
| • Time duration | • Fair decision |
| • The cost involved in the process | • Decision maker's freedom in proposing a creative remedy (win-win solution for parties involved) |
| • The party autonomy | • Bindingness |
| • Preservation of relationships | • Expert involvement |
| • Flexibility | |
| • Confidentiality | |
| • Enforceability | |

Based on your experience, please **comment on “effects/ impacts” of following risk factors** that can address from ADR characteristics in the view point of managing the particular risk.

Note

- When answering to this question please ignore the strike through risk factors under part 02, Q.A of this guideline and
- Please take into accounts here, the new risk factors if any that are listed under part 02, Q.B

No	Risk factors	Effects of the risk factor that can address through ADR characteristics
1	Financial risks like construction cost overruns, financial failures, delayed payments	Example: Financial risks of construction projects can directly cause effects like <u>high cost impacts</u> to the project, <u>negative relationships</u> with project teams due to dissatisfactions. <u>Indirectly, that can cause delays to construction projects</u> . In fact, an ADR method which is low budget, third party involvement available (to address negative relationships), less time consume will be suitable. (Please comment on any additional facts)
2	Defective work	..... .....
3	Technological risk; Technology changes	..... .....
4	Changes in Laws and local standards, political risks	..... .....
5	Time risk; scheduled delays	..... .....
6+7	6. Lack of availability of resources (7. material and lack of experience and skills)	..... .....
8	Lack of communication and team collaboration	..... .....
9	Variations; Scope changes	..... .....
10	Environmental risks; weather and climatic issues, unknown geological and site conditions and the like	..... .....
11	Economic changes; Inflation	..... .....
12	Documents and information risk	..... .....
13	Approval delays; Excessive procedures for statutory clearances and approvals	..... .....
14	Accidents at site	..... .....

No	Risk factors	Effects of the risk factor that can address through ADR characteristics
15	Social risks; language barriers, various cultures	
New		
New		
New		

QUESTIONNAIRE SURVEY

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Dear Sir/ Madam,

REQUEST FOR FILLING QUESTIONNAIRE

I am a student of M.Sc in Construction Law and Dispute Resolution of Department of Building Economics, University of Moratuwa. I'm currently conducting a research on the topic of **“suitability of alternative dispute resolution methods based on risk factors to the Sri Lankan construction industry”** with the aim of investigating the suitable ADR method(s) based on risk factors of construction projects for successful dispute resolution in construction projects in Sri Lanka

In this regard, this questionnaire survey is focused to identify the importance of each ADR method against construction risk factors filtered through expert interviews as risk factors that can impact for the choice of an ADR method.

I would be grateful if you could assist and support me by completing this attached questionnaire which will take approximately 15-30 minutes. **The information furnished with this questionnaire will only be used to carry out the dissertation and all of your information will be treated confidentially.** As I have a limited time frame to conduct this research, your early responses would be highly valued.

Thanking you in advance in anticipation of your kind collaboration.

Yours faithfully,
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SECTION A: RESPONDENT DETAILS

01. Name of the respondent (Optional)
02. Designation
03. Years of experience in the profession
04. Years of experience related to ADR methods

SECTION B: RANKING THE ADR METHODS WITH REFERENCE TO CONSTRUCTION RISK FACTORS

❖ Instruction to Respondents

- ✓ Answer **all questions** from your own experience or from your observations (Question 01-10)
- ✓ **Read the statement given under the heading on construction risk factor.** Following that statement, you are required to **assign a value from 1-5 Likert scale for the listed ADR methods in the given box.**

- 1** - Not significance in addressing the given statement
- 2** - Little significance in addressing the given statement
- 3** - Somewhat significance in addressing the given statement
- 4** - Significance in addressing the given statement
- 5** - Highly significance in addressing the given statement

01. Financial risks

If financial risk is the most significant risk factor in a construction project, an **ADR method which has lowest cost will be suitable.**

Example: Let's consider above statement and assume your opinion is as follows; Negotiation is highly significant, Adjudication is significant, Mediation & Conciliation are somewhat significant and Arbitration is not significant in addressing the statement of "an ADR method which has lowest cost"

Negotiation	Mediation	Conciliation	Adjudication	Arbitration
5	3	3	4	1

Please provide **your values** to below listed ADR methods using Likert scale by considering their level of significance to address the above statement.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

02. Technological Risk

If a project is more technical and technological risk is the most significant risk factor in a construction project, an **ADR method which can use expert knowledge** will be suitable.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

03. Risk on changes in policies, rules and regulations

If project is running in a duration where policies, rules and regulations are continuously changing and risk of changes in policies, rules and regulations is the most significant risk factor in a construction project, then an ADR method which **does not affected by policies and regulation changes is most suitable.** In fact, **less formal process** is more suitable where parties can mutually resolve disputes.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

04. Time risk (Risk on Project duration)

If time is the most significant risk factor in a construction project, an ADR method which can **resolve a dispute faster is suitable**.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

05. Risk on lack of communication and team collaboration

If risk on lack of communication and team collaboration is the most significant risk factor in a construction project, an **ADR method where third party involvement presence and parties allow to share ideas** is more suitable.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

06. Risk on variations in respect of scope changes of the project

If a project is more open towards variations in respect of scope changes of the project and if that is the most significant risk factor of a construction project, an ADR method which is **less formal and supportive will be suitable since then parties can run the project with mutual understanding**.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

07. Environmental related risk

If a project is more open towards environmental related risks and environmental risk is the most significant risk factor of a construction project, an ADR method **which supports to use expertise knowledge** for settlement of environment related disputes

is suitable since external party involvement is high in such projects (like CEA, UDA etc.)

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

08. Risk on documentation errors

If a project is more open towards risk on documentation errors and that risk is the most significant risk factor of a construction project, **an ADR method which is more formal that provides binding decisions** is suitable since in practice, parties are reluctant to accept documentation errors.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

09. Risk on excessive procedures for statutory clearances and approvals (Approval delays)

If a project is more open to risk on excessive procedures for statutory clearance and approvals and if that risk is the most significant risk factor in a construction project, then **a fast ADR method which can provide quick decisions** will be more suitable.

Negotiation	Mediation	Conciliation	Adjudication	Arbitration

10. Risk on social risk

If project is open to risk on social issues and social risk is the most significant risk factor in a construction project, then an ADR method which **can use a third party who is best to address a given social issue is suggested as effective.**

Negotiation	Mediation	Conciliation	Adjudication	Arbitration