

# EFFECTIVENESS OF ALTERNATIVE DISPUTE RESOLUTION METHODS USED IN THE HIGHWAY CONSTRUCTION PROJECTS IN SRI LANKA

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## ABSTRACT

*Effectiveness of dispute resolution affects immensely for success or failure of construction projects. This document consists of a literature review about alternative dispute resolution (ADR) methods including negotiation, mediation, Dispute Adjudication Board (DAB), ad-hoc adjudication, arbitration and ten critical factors affecting to effectiveness of ADR methods such as cost, speed, relationships, fairness etc. After decades of use there is no clear detailed analysis about used alternative dispute resolution in highway projects for their effectiveness and efficiency. In order to fulfil this gap, this research is conducted to evaluate effectiveness of used ADR methods regarding ten critical factors.*

*The research methodology adapted was qualitative within multiple case studies from disputes arisen in Expressway Construction projects. The primary data collection techniques used in this study were ADR documents and semi structured interviews. Content analysis was used to analyse these documents and cross case analysis to compare cases findings to each other. The research findings revealed that ratings for critical factors fluctuate from case to case significantly. In the discussion of research findings, key attributes identify which was the cause for fluctuations. So one cannot simply say this or that factor affects most to the success and this ADR method is best way to deal with disputes. According to study it's not fair to deal with every dispute in the same manner, so categorization of disputes concerning key attributes needed for improved efficiency of ADR methods.*

*Guidelines developed include steps, tables and flowcharts for using ADR methods effectively. These findings and guidelines are presented in a logical, systematic and a sensible way to identify the ideal ADR method for a given dispute rather than relying on subjective decisions. It is hoped that these findings and guidelines will be useful to the stakeholders in future highway projects and can be adapted to the whole industry.*

**Keywords:** *Alternative Dispute Resolution; Critical Factors in Dispute Resolution; Expressway Construction Projects; DAB; Cross Case Analysis.*

## 1. INTRODUCTION

Harmon (2003) the intricacy and magnitude of the construction work often lead to complex disputes. Highway construction in last decade in Sri Lanka was huge leap in road construction creating high magnitude construction work. Since highway construction projects are multibillion projects with very complex infrastructure developments, there will be disputes which cannot be settled without more formal methods such as Mediation, Arbitration and Adjudication. In FIDIC (1987) which was Bidding Document of Most Expressway projects in Sri Lanka speaks about arbitration while FIDIC (1999) focused about DAB for resolving disputes. Both suggest strict steps to follow for every kind of disputes.

Cheung *et al.* (2002); She (2011); Gunasena (2010) identified ten factors to evaluate effectiveness of ADR methods which can be adopted to Sri Lankan highway sector to identify problems in used ADR methods and evaluate effectiveness of the process. The aim of this study is to identify critical factors affecting to effectiveness of the ADR methods. Further, research intends to evaluate attributes of Disputes which affect to critical factors in order to make necessary suggestions to improve.

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### 1.1. NEED OF SEPARATE STUDY FOR HIGHWAY CONSTRUCTION PROJECTS

Road network should be efficient in order to maximize economic and social benefits of a country. These infrastructures play a primary role in achieving national development and contributing to the overall performance and socioeconomic well-being of the community (Sengupta *et al.*, 2007). Highways play a significant role in the any country's economy. Hence, developing countries like Sri Lanka tend to construct many highways (Priyantha *et al.*, 2011).

Priyantha *et al.* (2011) identify increasing number of highway construction in Sri Lanka and related problems like conflicts, variations, claims and disputes are multiplying in those projects. Our nearest country, India faces huge lockdown in highway sector according to Parikh and Joshi (2013). "123 highway projects out of a total of 406 awarded so far by the National Highways Authority of India (NHAI) since 2000 are caught in the arbitration tangle. 103 cases are being settled at the DAB formed by the NHAI, while the rest are under various courts". In Sri Lanka it's important to produce effective ADR methods before such situation arrive.

## 2. ALTERNATIVE DISPUTE RESOLUTION METHODS

According to Fenn *et al.* (1998) success and general acceptance of these ADR methods had been so refreshing that the courts themselves are now encouraging to modifying their rules to allow ADR methods to be incorporated into their range of resolution options. Wimalachandra (2007) further mentioned numerous advantages of ADR like flexibility, confidentiality, time saving, cost savings, informality and low antagonism between the parties. Cheung (1999) demonstrated the relationship of ADR methods and level of cost and hostility escalations by stair step model as given in Figure 01. The rising steps in the model imitate the Increasing levels of cost and hostility associated with the various forms of ADR.

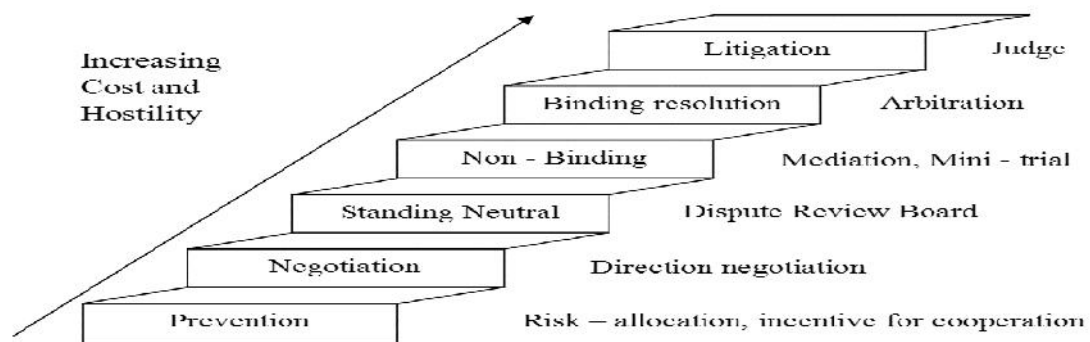


Figure 1: Stair Step Model for Dispute Resolution Process in Construction

Highway construction projects in Sri Lanka used ADR methods like Negotiation, Adjudication, DAB and Arbitration and rarely use Mediation, Ad-Hoc Adjudication, etc.

### 2.1. CRITICAL FACTORS AFFECTING TO EFFECTIVENESS OF ADR METHODS

ADR methods in dispute resolution are among recognised key input for success in highway Projects. In order to evaluate effectiveness of above mention ADR methods, factors affecting to effectiveness have to identify first. Previous researchers internationally (Cheung, 1999; Cheung *et al.*, 2002; She, 2011) and locally (Arsecularatne 2011, Gunasena 2010) have identified several factors and attributes which critically affect the ADR practices. Among above studies Cheung's (1999) article is considered as important because he identifies twelve critical attributes which are affecting ADR methods. Cheung (1999) in same article allocates those attributes into five different Critical factors. Cheung *et al.* (2002) in his late studies firmly identified ten factors that are used to test the performance and selection of dispute resolution methods namely cost, speed, outcome, enforceability, privacy and confidentiality, open and fairness, control, flexibility, creative remedies and relationships. She (2011); Gunasena (2010), etc. used these 10 factors to evaluate effectiveness of ADR methods. Researcher selected these 10 factors of Cheung to evaluate effectiveness since it's the latest, widest and most famous.

### 3. RESEARCH METHODOLOGY

Since study is done to evaluate how critical factors are affected to ADR from existing examples, most suitable approach for the research was qualitative approach and case study method.

- Identification of unit of analysis - Disputes arisen in highway project in Sri Lanka.
- Defining number of cases - three numbers of cases selected.
- Criteria for selection of cases - The cases were only selected from Expressway projects due to the fact they were the most notorious in generating disputes with highest impact. Every case was different to each other in many ways.
- Data Collection - Document review and semi-structured interviews.

### 4. RESEARCH FINDINGS

The case studies were extracted from two expressway construction projects which were using ADR methods. Cases were selected from vast pool of cases after preliminary study so these three cases are different to each other in many ways but carrying very significant value inside which worth a comprehensive analysis.

Table 1: Details of the Selected Cases

<i>Case</i>	<i>Case A</i>	<i>Case B</i>	<i>Case C</i>
<b>Dispute</b>	Additional Payment due to Legislation Changes to VAT on Bitumen	Payment for Environmental control & Protection	The Viaduct Foundations claims due to changed ground conditions
<b>Claim amount (Rs.)</b>	3 million	70 million	120 million
<b>ADR</b>	Negotiation, DAB	Negotiation, DAB	Negotiation, DAB
<b>Settled by</b>	DAB failed. Amicably settled Before Arbitration	DAB decision –Entitled, Claim Granted	DAB Decision No Entitlement, No additional Payment
<b>Payments for DAB</b>	525,000	906,500	900,000

#### 4.1. PROCESS OF PRESENTING RESEARCH FINDINGS

Findings were present relating to sequence of questions asked from interviewees. As shown in interview transcript, every interviewee had to rate criticality of factors affecting to the whole construction industry first. For every case minimum four interviews conducted.

Table 2: Description of Interviews Distribution

<i>Case</i>	<i>Case A</i>	<i>Case B</i>	<i>Case C</i>
Total DAB Participants in hearings	8	9	12
DAB Members Interviewed	1	1	1
Members Interviewed from Contractors, Consultants, & Employers	3	3	4
<b>Total Interviews Conducted</b>	<b>4</b>	<b>4</b>	<b>5</b>

Table 2 represents the allocation of interviews for cases. Before moving onto cases, findings from data collection regarding the whole of construction sector are presented. Introduction for document analysis is presented afterwards, and finally followed by findings from cases.

#### 4.2. CRITICAL FACTORS AFFECTING TO EFFECTIVENESS OF ADR METHODS

In the interviews, interviewees were asked to rate the criticality of factors affecting to effectiveness of overall ADR methods. These factors were derived from the literature based on studies of Cheung *et al.* (2002) ten factors and modified according to Sri Lankan context. For this study participant's idea about both overall ranking for factors and which were critical to selected case were recorded separately. Hence there are two separately rated tables for each case for each interviewee.

Overall criticality ranking table was commonly marked once by interviewee but criticality ranking of each case marked separately hence there are a total of four tables for three cases. This section presents ranking of criticality and analysis of the data presented using 'checklist matrix analysis' method.

#### 4.3. RATINGS FOR FACTORS AFFECTING TO EFFECTIVENESS OF ADR METHODS - OVERALL

All the interviewees' ratings were obtained one time for below table which represents their view of criticality ranking in identified factors relating to the whole construction industry disputes.

Table 3: Ranking of Factors Overall

Factors	Total Mark	Rank
Cost	30	06
Openness, Neutrality & Fairness	36	02
Speed	40	01
Outcome	29	06
Privacy and Confidentiality	32	05
Enforceability	27	09
Preservation of Relationships	36	02
Flexibility	22	10
Creative Remedies	34	04
Degree of Control	29	06

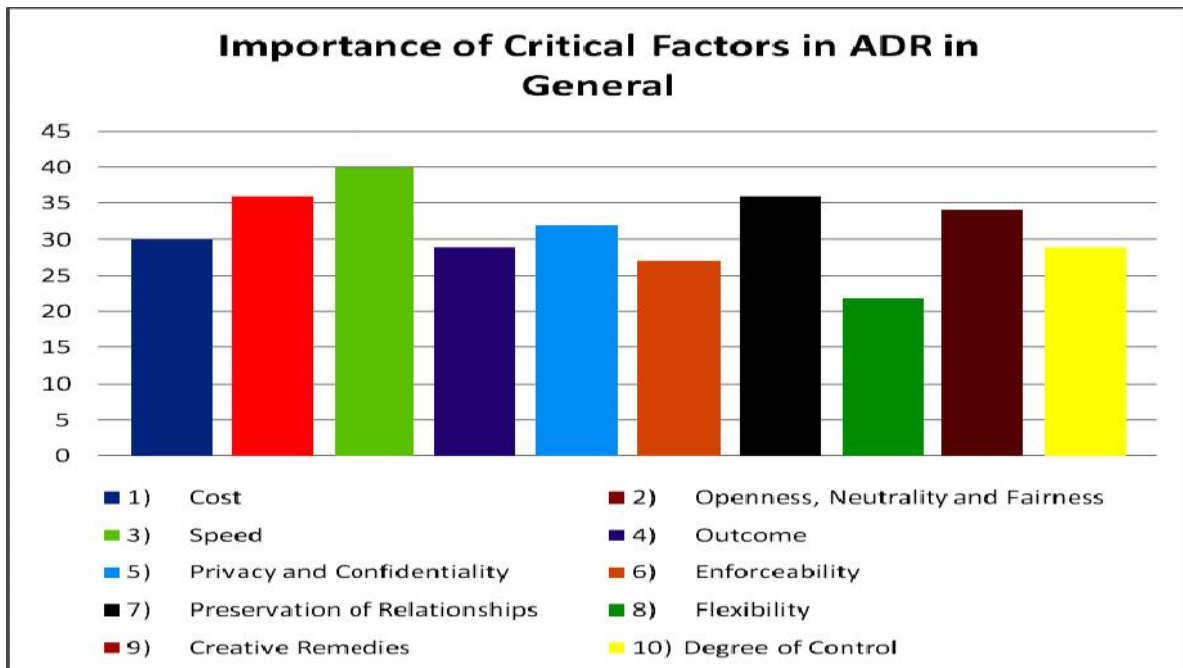


Figure 2: Rating for Critical Factors

#### 4.4. CASE A IN BRIEF

Before the commencement of contract, sales of bitumen were subjected to value added tax (VAT) of 12% but afterwards the government removed VAT on bitumen. But price reduced after three months, with somewhat similar value for VAT removing. In the face of it, this shouldn't have affected the contractor because the project was excluded from VAT. But problem arises with regard to price fluctuation clause. Because of the drop of market price for bitumen, ICTAD indices which were used to calculate price fluctuation also reflected a fall. Due to that, the payment contractor received for bitumen was reduced. In other words VAT removal did not affect the cost of bitumen to contractor, but it lead to a reduction of contract price paid to the contractor. So changing of litigation resulting with additional cost to the contractor which was not redeemable.

Employer argued that contractor cannot prove changing of VAT resulted in fall of price. Also employer used a previously given Arbitration award related to exemption of VAT from diesel which was given in his favour. DAB decided price fall was a result of removing VAT from bitumen and most importantly relying on confidentiality argument and said they are not considering arbitration award because arbitration awards are confidential unless revised by the court. So DAB decided that the employer is not acting according to conditions so instructed to redeem the contractor for additional cost by paying it. Employer wasn't satisfied with this decision and issued notice of dissatisfaction and prepared to go to arbitration procedure. According to contract provisions both parties willingly and amicably settled before going to arbitration for a win-win situation.

Table 4: Ranking for Critical Factors in Case A

Factors	Total Mark	Rank
Cost	19	02
Openness, Neutrality & Fairness	15	04
Speed	13	07
Outcome	12	08
Privacy and Confidentiality	15	04
Enforceability	11	09
Preservation of Relationships	20	01
Flexibility	8	10
Creative Remedies	18	03
Degree of Control	14	06

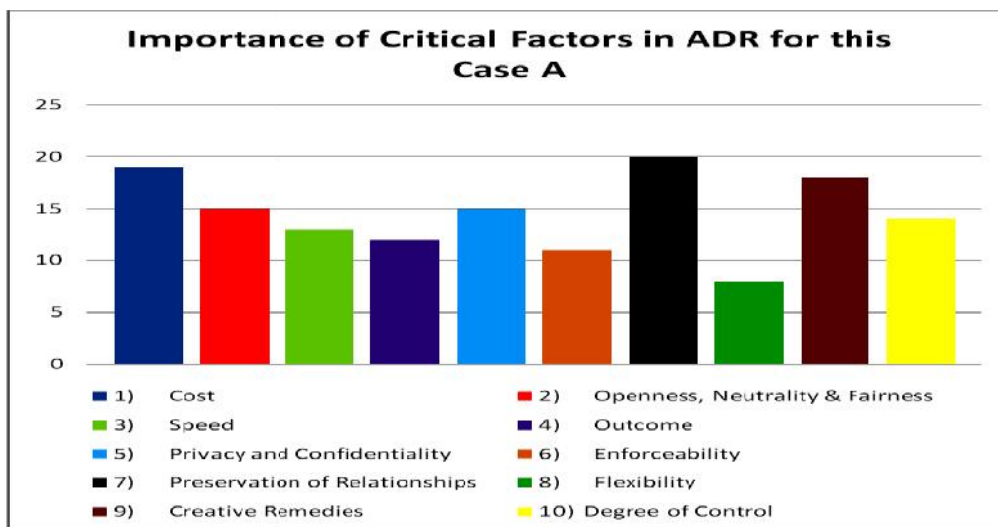


Figure 3: Ratings for Critical Factors Case A

#### 4.5. CASE B IN BRIEF

Case B was occurred at a initial stage of the construction due to the difference in contention on the payment for Environmental Control and Protection which had to be carried out by the Contractor as specified in Sub section of the Specifications. The Contractor contended that the Cost of Environmental Control and Protection should be paid under Provisional Sum.

The Employer contended that Environmental Control, Protection and Monitoring were included in the scope of works in Contractor's Site Establishment and that the Contractor wasn't ended for payment for this activity under Provisional Sum. Additionally Employer thought in tendering, Provisional Sum was for any additional matters which can be popup at construction, security and maintain. But due to delays Engineer gave permission and instructions for test to be started which was recorded as unqualified approval by engineer's representative.

This dispute had effect to testing procedures and contractor withheld the second set of testing carrying out which included important details. Withheld testing was affected the critical path of the program and speedy decision was required in order to minimize risk for the work and environment. DAB decided the Contractor is entitled for payment under "Provisional Sum" for carrying out environmental control and protection required by the specifications, but confined to the scope in specifications with some adjustments done using actual cost occurred for expensive testing. This decision was somewhat creative remedy for both parties where, everyone's happily walk away with quick decision.

Table 5: Ranking for Critical Factors in Case B

Factors	Total Mark	Rank
Cost	4	10
Openness, Neutrality & Fairness	16	04
Speed	20	01
Outcome	14	06
Privacy and Confidentiality	13	07
Enforceability	16	04
Preservation of Relationships	20	01
Flexibility	10	09
Creative Remedies	19	03
Degree of Control	13	07

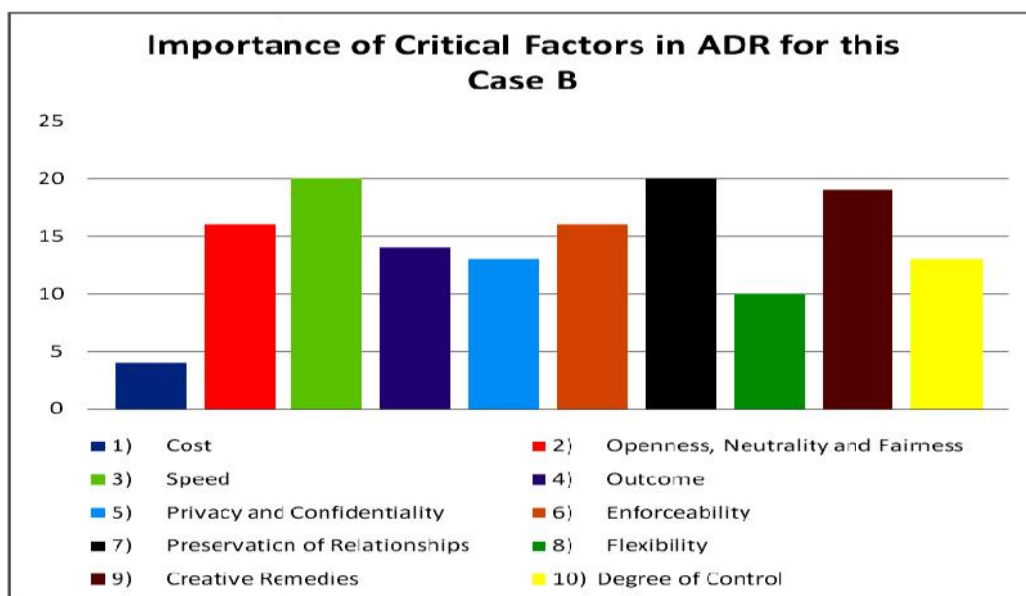


Figure 4: Ratings for Critical Factors in Case B

#### 4.6. CASE C IN BRIEF

Dispute was occurred at latter stages of the construction due to contractor's belief to entitlement of additional payment and extension of time for re-design and additional works for bridge foundations due to change in ground condition. Contractor prepared the detail design based on the tender design based on such design approved by the engineer. The contractor stated that during the execution of work they encountered different site conditions at site. Due to this the contractor had to redesign the foundations. Contractor relied on to some sub clauses in condition of contract and data provide by employer, in addition, the claimant had cited "Unfair Contracts Terms Act No.26 of 1997.

The engineer stated that the contractor was responsible for the detail design prepared by them (for bridges) and also interrelation of the ground conditions since there was provisional sum for additional soil investigation. Employer relied on a document "Data provided by the Employer" and the "disclaimer" stipulated therein. So employer argued contractor cannot rely on initial document and had to prepare detail drawings with his findings from testing.

DAB decided there was sufficient time from submission of bid. In documents there was uncertainty stated in the date together with provision to carry out additional soil investigation. So experienced contractor had foreseeable physical conditions and was completely responsible for the final design of structures which specified in the contract as detailed design is an obligation of the contractor. DAB also rejected Unfair Contracts Terms Act stating about significance of an extra contractual exemption clause. DAB rejected the contractor's claims but agreed to instruct to issue two variations for some additional work carried out by contractor.

Table 6: Ranking for Critical Factors in Case C

Factors	Total Mark	Rank
Cost	8	10
Openness, Neutrality & Fairness	22	01
Speed	18	05
Outcome	17	07
Privacy and Confidentiality	19	02
Enforceability	19	02
Preservation of Relationships	19	02
Flexibility	15	08
Creative Remedies	18	05
Degree of Control	15	08

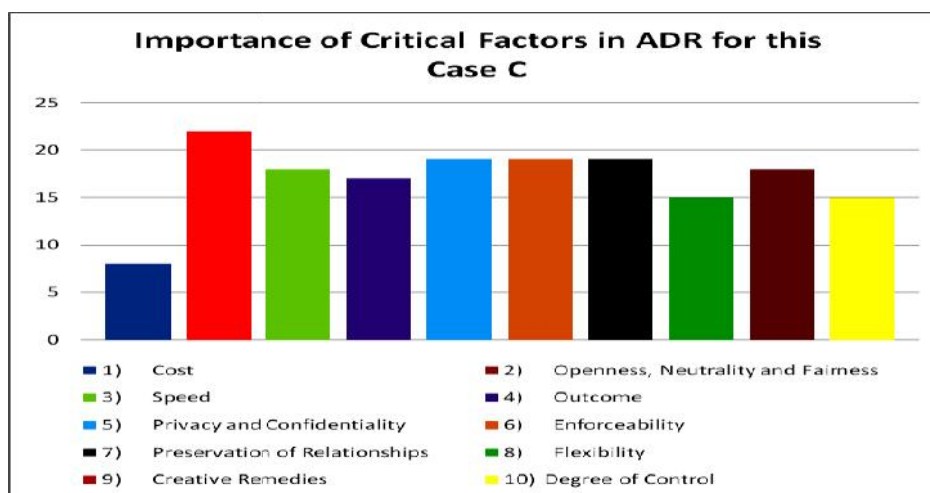


Figure 5: Ratings for Critical Factors in Case C



#### 4.7. WORD FREQUENCY RESULTS CONSIDERING ALL CASES

Documents of cases were run through independent word frequency queries to get an idea about what words most frequency used. Techniques like “Stop word List” and customizing query were used to select results. Words with similar meanings and words related to similar factors added to primary value to get more accurate results. Using Excel functions list shortlisted to 10 factors and query result is shown below.

Table 7: Frequency of Critical Factors in All Documents

Word	Weighted Percentage (%)	Similar Words
Other	93.72	
Cost	2.38	cost, payments, cash, amount, sum, fee
Speed	1.41	speed, time, period, program
Creative	0.54	remedies, creative, negotiation
Control	0.47	control, degree
Relationships	0.35	relationships, connection, Preservation
Privacy	0.29	privacy , confidentiality
Outcome	0.26	outcome, satisfaction
Enforceability	0.21	enforceability, binding
Flexibility	0.20	flexibility, flexible
Fairness	0.17	fair, fairness

In above table, all ten factors obtain considerable weighted percentage. Considering these findings it's clear than in ADR methods these factors are used in ADR documents. Case study results establishes literature about 10 critical factors existence and their affect to effectiveness of ADR methods.

#### 4.8. FLUCTUATIONS IN RANKING OF CRITICAL FACTORS

Considering all three cases there were many fluctuations in ranking among the factors about their criticality. Below Table 8 elaborates most eye-catching differences between cases regarding criticality

Table 8: Fluctuations in Ratings

Factor Affecting to ADR	Industry	Case A	Case B	Case C
Cost	6	2	10	10
Openness, Neutrality & Fairness	2	4	4	1
Speed	1	7	1	5
Outcome	7	8	6	7
Privacy & Confidentiality	5	4	7	2
Enforceability	9	9	4	2
Preservation of Relationships	2	1	1	2
Flexibility	10	10	9	8
Creative Remedies	4	3	3	5
Degree of Control	7	6	7	8

One thing is clear when you look at this table which is criticality ranking of the factors are changing from case to case significantly. One can not simply say this or that factor affects most to the success. So it is not fair to deal with every dispute in the same manner.



#### **4.9. EXAMPLE 01 - ANALYSING FLUCTUATIONS IN SPEED FACTOR**

Table reflects discrepancy in ranking for speed factor. She (2011), Gunasena (2010), etc. described speed is the most critical factor, highest rated. But cases A and C ratings show different story.

##### ***In Case A***

Dispute had no direct effect to construction progress or program so it is not a critical event and it does not cause any disturbance to work or cash flow of contractor. Contractor already getting paid for fewer amount due to drop in ICTAD indices as described. Case was about additional payment due throughout the construction period and it is clear without this payment contractor can work according to contract. So speed of dispute resolution had less impact comparing to other factors.

##### ***In Case B***

Speed of decision given (time taken for DAB) has much more importance because dispute was critical event and it cause disturbance to work. Contractor stopped carrying out testing procedures and some danger was there. Dispute did not affect cash flow but it stops the work so near maximum criticality was there.

##### ***In Case C***

Contractor submitted claim after construction was finished and it had no direct effect to construction process ongoing at that time. As described current program did not affected much but considering financial value (120 million), contractor's cash flow and interest payment on demand, criticality of speed factor has to be more than case A but less than case B.

- Fluctuations in rating are due to impact to current program and cash-flow so criticality of factors is dependent on impact to construction program and cash-flow of the parties.

#### **4.10. EXAMPLE 02 - FLUCTUATIONS IN COST FACTOR**

Table reflects discrepancy in Rankings considering cost factors when comparing Cases A, B and C. Considering cases, case A obtained high rating than B and C. Accordingly claim in case A was the smallest as shown in Table 8 comparing to B and C cases. Additional cost (payments) for DAB was very high comparing to dispute (1/4 of claim amount) value. In case A, DAB paid for additional 2 hearings, meeting and daily fee for studying dispute pulse document charges which sums up near at half a million. But B and C cases cost for DAB were higher but it's percentage-wise less percentage of claim, respectively 1.41% and 0.8%. So lesser rating for B and C cases was justified comparing to Case A.

- It's safe to decide that low ratings for B and C were due to significance of dispute's monetary value when comparing to payments paid for ADR. So high ranking for A was due to less dispute value. Criticalities of factors are depending on disputes monetary value (claim amount).

#### **4.11. KEY ATTRIBUTES IMPACTED TO CRITICAL FACTORS**

As emerged from this Case study criticality of factors depend on some very key attributes related to each Case. Each case is Unique in Nature. According to these key attributes ranking for critical factors are changing from case to case significantly. Using findings from cross case analysis above, key attributes can be identified as below.

- Dispute's monetary value - amount of dispute / claim
- Construction Program - as build program to identify affect to critical path
- Cash-flow of the parties - disputes resulting cash block down
- project duration - long term or short term (time left for Completion)
- Importance of parties to each other - authority and future opportunities
- Availability of grounded arguments - validity entitlement to both parties

- Speedy solution requirement - parties requirement to get decision quickly
- Nature of Client - government, semi government or private, etc.

But some factors had no effect from these attributes. As an example Openness, Neutrality and Fairness factor which will not change its criticality across the cases. Fairness has to be there for every case similarly, without being affected by anything.

There are interconnections between ten critical factors affecting to the effectiveness of ADR methods. Changes in one factor rating can be affected to others positively or negatively. Person cannot isolate one factor and describe how critical it can be for final outcome. We have to consider all these factors and attributes as a whole and then it will give a crystal clear image why that factor got a higher ranking and why ADR methods are successful for particular case.

#### 4.12. SUMMARY OF FINDINGS

Above findings leads to the conclusion that critical factors identified in literature review are affects to the effectiveness of ADR methods. But one cannot put a finger on speed, cost and say that factor has highest impact for success. Criticalities of the factors change from case to case significantly according to the attributes of the cases. So it is not fair to deal with every dispute in the same manner.

As emerged from this study criticality of factors are dependent on dispute's monetary value, construction program, cash-flow of the parties, nature of the project, importance of parties to each other, availability of grounded arguments and speedy solution requirement. Also analysis found that, critical factors are interconnected and can be affected to each other either positively or negatively. Participants stated that low value disputes had issue when going for contractual DAB methods regarding cost factor. So, they tend to be negotiated or neglect those disputes rather than complaining to DAB.

#### 4.13. PROPOSED IMPLICATION TO THE HIGHWAY PROJECTS

The study showed that critical factors identified in literature were affecting to effectiveness of ADR methods. Criticalities of the factors are changing from case to case significantly according to attributes of the cases. So it is not fair to deal with every dispute in a same manner. But in whole construction industry including highway projects disputes are dealt with same manner. The study disclosed that some key attributes impacted to critical factors effectiveness. So according to those attributes, applicable ADR methods have to be varying to counter fluctuations described above. Considering findings of this study as the base, the below mechanisms are suggested as recommendations to improve effectiveness of ADR methods and this implication is directly applied to highway sector

- Divide disputes into ranges according to impact it causes to program and considering dispute's monetary value.

Considering effect to critical factors from two key attributes, namely monetary value and construction program, ADR methods have to be changed. Parties need quick and binding result in critical path event and cost is less significant considering high value dispute. First establish ranges in these two elements and calculate where the dispute stands in predetermined ranges. Each range has different ADR methods.

Table 9: ADR Methods for Different Ranges

Criticality	Dispute Amount	ADR method Suitable
Yes	High	DAB → Arbitration
Yes	Less	DAB → Arbitration
No	High	DAB → Arbitration
No	Less	Mediation → Ad-Hoc Adjudication

*Example - Didnot go to DAB for less than a million, non-critical disputes*

- Include Mediation ADR method to contract document for used only for low monetary value non critical path disputes. If Mediation fails to arrive at agreement, sole ad-hoc adjudication will commence rather than contractual DAB or Arbitration considering high cost.

Main recommendation in this study is a guideline for using Alternative Dispute Resolution Methods in Highway Construction shows using “Flow Chart” method. Guideline recommended for Expressway and Highway construction projects but can be successfully implemented in other areas too.

**Proposed Guideline for using Alternative Dispute Resolution Methods in Highway Construction - Flow Chart**

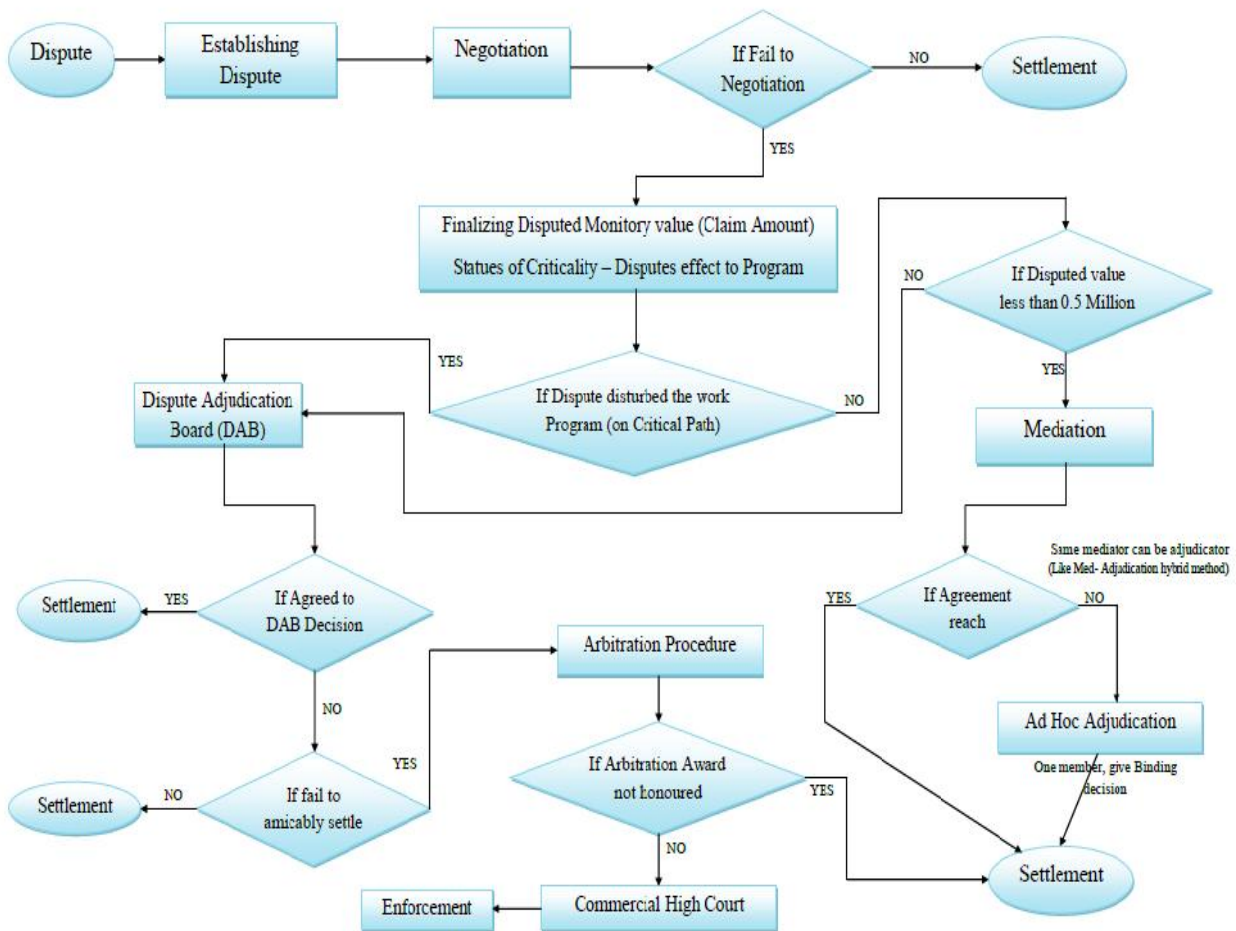


Figure 6: Proposed Guideline for using ADR Methods in Highway Construction

**5. SUMMARY**

This document indicates a new way of dealing disputes according to scenarios rather than following Contractual ADR procedures indicated in contract documents like FIDIC. It is not fair to deal with every dispute in a same manner because Criticalities of the factors are changing from case to case significantly according to attributes of the cases. So, best suited ADR method has to be determining after considering effect from key attributes to dispute.

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