



## An AHP based evaluation for suitability of Alternative Dispute Resolution (ADR) in construction project delivery: A case study of Bauchi State, Nigeria

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### Abstract

Today's construction project is becoming more complex and more capital intensive. Public sector of developing countries of the world are responsible for the provision of infrastructural facilities to its citizenry. Studies have however, found that these projects are delivered late by contactors and disputes have been found as a major cause of such late deliveries. Therefore, the use of ADR (Alternative Dispute Resolution) in resolving construction disputes cannot be over emphasized. However, when using (ADR) methods for dispute resolution, it is vital to select the most suitable method based on the dispute types and other goal of the disputing parties. This study aims at an assessment structure established on the Analytical Hierarchy Process (AHP) to assess the suitability of (ADR) method in construction project delivery. The assessment model is classified into three critical criteria, namely: (1) Financial factor (2) Organizational factor and (3) Legal factor. These criteria are further accumulated into 22 sub – criteria to gauge the suitability of (ADR) method. This finding shows that financial factors are the most important in this research. Thus, this study novelty is seen in developing two key aspects: A more detailed explanation of major factors and sub – factors critical to the selection of (ADR) method in the delivery of construction project, in order to enhance construction stakeholders' dispute resolution capability.

**Keywords:** Analytical Hierarchy Process (AHP), Alternative Dispute Resolution (ADR), construction contracts, mediation and adjudication, Bauchi State, Nigeria

### Introduction

The last decade has seen a significant enlargement of the construction sector in Nigeria especially the public sector. This surge primarily derives from the necessity occasioned by rapid urbanization and government's educational and social services developments, which have made infrastructural development of state governments a paramount imperative (Osigbemhe and Akanni, 2024) [14]. State governments in Nigeria as a subsidiary of Federal government are home to an endless array of construction projects, residential, institutional, commercial and infrastructural works (Akintoye and Maina, 2020) [1]. Disputes are inevitable in construction projects. Once disputes arise, it needs time, resources and efforts of the project stakeholders to find a resolution because dispute are expensive and negatively impact the successful completion of a project (Amila, 2023) [3].

Ogunlana and Ogundipe (2022) [11] are of the view that the efficacy of ADR method in Nigerian Construction Industry is becoming increasingly apparent as they offer stakeholder the opportunity to reach amicable resolutions without disrupting project activities. The traditional litigation process is often time – consuming and costly, further exacerbating delays. As a result, a growing shift towards alternative dispute resolution (ADR) methods, which are considered more efficient and flexible in resolving dispute is currently the emerging trends (Oladinrin, Ogunsemi, and Aje, 2021). These methods not only help in militating delays but also in maintaining relationships between stakeholders, which is crucial for the long – term sustainability of the industry. Lee et. Al. (2021) [8] observed that despite the advances of using ADR methods, they are also resources consuming too. Hence, choosing the right dispute resolution technique is vital for stakeholders to find a resolution

without spending more time and resources while maintaining the business relationship.

The purpose of this study is to develop an (AHP) based model for evaluating the suitability of (ADR) method on construction project dispute in order to aid the project stakeholders evaluate the most suitable (ADR) methods to select, applying the Analytic Hierarchy Process (AHP) decision model. The study findings will provide consistent and comprehensive suitability criteria for (ADR) methods evaluation for projects stakeholders in dispute and also for professionals in construction industry. The suggested suitability criteria may also be used as benchmarks for (ADR) method adoption by construction industry professionals.

### Literature Review

#### 1. Methods of Dispute Resolution

Dispute resolution, in its widest sense, includes any process which can be employed to bring about the conclusion to a dispute. Acharya and Lee (2006) concluded that most conflicts may appear to be minor in nature at initial stage, and if not handle well, could result in claims, counter claims, troubles and bad relationships between project participants. The importance of dispute resolution in the construction industry is also recognized by the Royal Institution of Chartered Surveyors (RICS). The main objective of any dispute – resolution mechanism according to El – Adaway and Ezelding (2007), is to ensure that the duties under the contract are fulfilled and to provide compensation for any breaches of these duties. Dispute resolution techniques have been seen by many researchers as a spectrum ranging from the most informal negotiations between the parties themselves, through increasing formality and more directive intervention from external

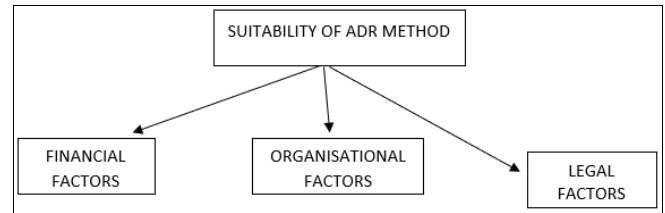
sources, to a full – court hearing with strict rules of procedure (Gebken and Gibson (2006). These procedures include negotiation, mediation, conciliation, neutral evaluation, expert determination, adjudication, arbitration and litigation. Arbitration and litigation however, appear to be the oldest forms of dispute resolution technique. (Ofori, 2007). Harmon (2003) believed that litigation is especially in appropriate resort. Studies supported the view that, before adoption of particular (ADR) method certain factors must be taken into consideration to achieve successful adoption.

**2. Choosing a Dispute Resolution Method**

While there are different (ADR) methods, it is important to choose the right methods to settle the issues that arise with a dispute. In this case, a goal should be choosing the most efficient and effective (ADR) method that brings resolution to the dispute. Therefore, the parties need to decide wisely paying attention to their goals and pros and cons of each (ADR) method.

There are researches done on the topic of (ADR) methods and causes of construction disputes. However, there are not

many recent studies on evaluation and choosing the most appropriate (ADR) method for construction dispute. According to Cheung et. al. (2002), the ten most influencing factors impacting the choice of (ADR) method are voluntariness, neutrality/fairness, confidentiality, knowledge of construction, creative remedies, consensus agreement, enforceability, cost, speed and preservation of relationship.



The major factors and sub – factors considered are the criteria and sub criteria and can be seen in table 1. The table below display the three (ADR) method, Suitability Evaluation factors as obtained.

**Table 1:** The Suitability Criteria of Adr Method

No	Suitability Criteria	Suitability Sub – criteria
1	Financial	1.1 Cost incurred for ADR PROCESS 1.2 Cost minimization technique 1.3 Duration for dispute resolution 1.4 Impact of Time and Cost
2	Organizational	2.1 Awareness of each (ADR) method 2.2 Communication and Documentation issues 2.3 Preservation of relationship of all parties 2.4 Parties needs on prevailing dispute 2.5 Administration of dispute settlement proceeding 2.6 Reputation of parties 2.7 Power Imbalances 2.8 Quality of Outcomes
3	Legal Institutional support ADR (e.g. stay of litigation fo arbitration)	3.1 Certainty of law 3.2 Confidentiality 3.3 Neutrality and Enforceability 3.4 Procedural 3.5 Flexibility and informality 3.6 Possibility to appeal 3.7 Parties ability to maintain control over dispute 3.8 Degree of control by the neutral 3.9 Fairness 3.10 Consensus, Local Acceptance and Trust & time efficiency 3.11 Liability for opponent's cost

Generally, according to available secondary data, there are 23 factors influencing selection of an ADR method. These factors are further categorized into three main categories. Those main factors categories are financial factors, organizational factors and legal factors.

**Methodology**

**a. Sampling**

In this study, an observation was conducted to evaluate the suitability of (ADR) methods in construction dispute on public sector construction contracts within Bauchi State. Questionnaires were issued to the respondents that involved two experiences contractors, three construction professionals and expert construction arbitrator. There was a total of six questionnaires experts disseminated gathered by them. The information obtained by the survey was employed for implementing AHP and for weight consideration in order to recheck variables based on

findings. Therefore, six questionnaires were distributed in this study, so six answers were received. In this, the response rate is there 100%.

**b. Analytic Hierarchy Process (AHP)**

AHP is a comparative valuation theory by measuring the priority scale of comparing intangible objects from the pair ratio matrix based on human judgment. Subjective value interpretation is put into the form of a 9 – point scale where the empirical fundamentals are put forward. The AHP eigenvector technique processes, these importance loads from a single or collection applying their psychometric scale of formulating the requisite pairwise assessment. This method has been broadly applied and developed to multi – criteria decision – making problems to find a combination significance vector in a tiered structure. Generally, a decision construction consists of three key aspects: Objective standards and decision option.

In this research, an evaluation structure built on AHP is suggested to analytically assess the suitability of (ADR) method in the effective and efficient construction dispute resolution, prejudiced by the comparative significance of each criterion for (ADR) method have been identified, as is shown in Fig. 1.

Processing of AHP data involves four essential steps that are:

**Step one: developing the hierarchical structure**

This study aims at developing a hierarchical structure based on several criteria that have been discussed in previous researches. It seeks to identify the most suitable (ADR) method. The hierarchy relies on the structure’s complexity. This study overlays two stages:

Tier 1 comprises financial, organizational and legal criteria, and tier 2 – includes 23 – sub – criteria of identity possible. The highest suitability criteria are categorized into tier 1 and 2 in this study.

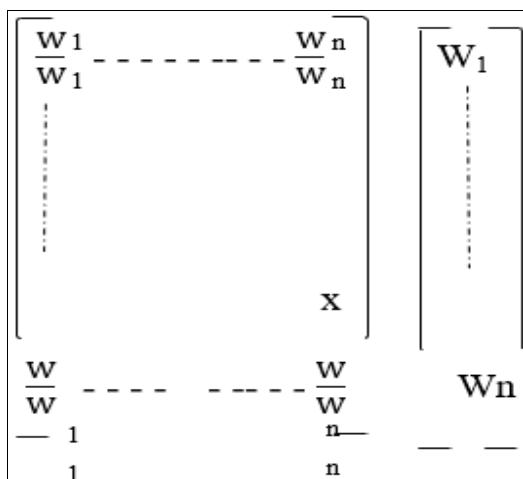
**Step two: Putting up the pairwise relative matrix across the survey**

The survey questionnaire was used to obtain the comparison result of each construction pair expertly in proficient pairwise, applying a I – level assessment scale.

**Step three: Discovering the eigenvalues and eigenvectors**

The stage is taken in compliance with the rule. It was rendered by entering in the second step comparing each variable in pairs and generating a relative weight value at stages 1 and 2. The pairwise matrix is shown further down.

$W = (W_1, W_2, \dots, W_n) T$  as the vector  
(W and n) are numbers of component



N and W in (1) in the matrix are entitled the eigenvalue and right eigenvector of matrix A. then, the experimental matrix A comprises discrepancies. The approximation of W (symbolized as w) can be taken likeness to (1).

$$\underline{A} \times \underline{W} = \lambda_{max} \times \underline{W}$$

A is the pairwise judgement observed matrix. λ max is the biggest eigenvalue of A, and W is its accurate eigenvector.

**Step four: Accumulating the relative loads**

Diverse echelons acquired in phase three are merged to yield a vector & multiple loads aiding as a varying degree for (ADR) methods suitability in accomplishing the supreme overall goal of this study.

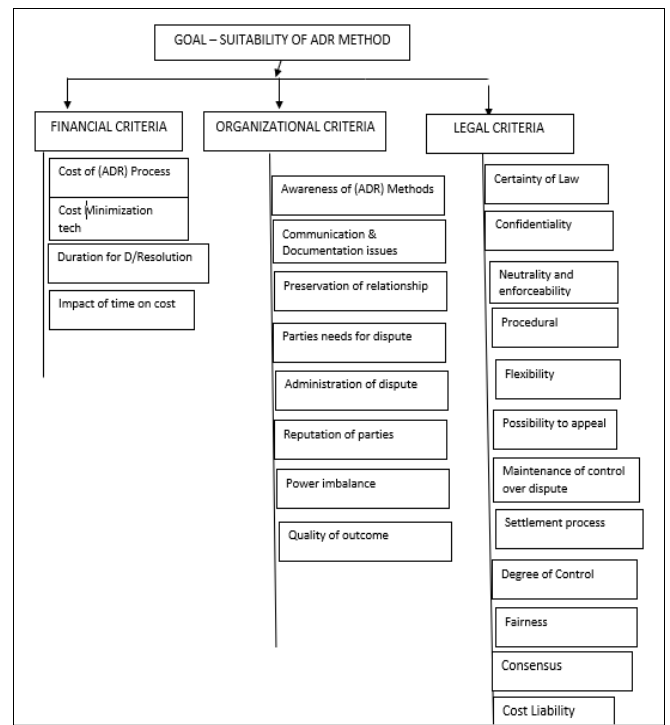
To certify the study’s reliability, the consistency index (CI), the first sign of the exactness of pairwise comparison, is created. The method to determine indicator to obtainable underneath.

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Thus, the Consistency ratio (CR) is estimated for more analysis, whereas ACI is the average index of randomly created weights.

$$CR = \frac{CI}{ACI} \times 100\%$$

The Consistency indicator is tolerable if the CR ratio <0.1. Conversely, the pairs comparison must be relative.



**Fig 1:** AHP Model for Evaluating the sustainability of ADR Methods on Construction Project Dispute

**Results**

The evaluation of (ADR) method was established after a thorough survey and consultations with some specialist. The empirical findings indicate that financial, organizational and legal factors are regarded as essential (ADR) method suitability criteria. Thus, this study’s novelty is seen in developing two key aspects: a more detailed explanation of sub-suitability criteria and major suitability criteria to enhance the decision-making process of public sector construction project stakeholders in Bauchi State towards selecting the most appropriate (ADR) method.

Moreover, this framework offers a more detailed and systematic factors influencing the selection of efficient and effective (ADR) method by conflicting parties on construction project. This study provided a more systematic specification of criteria of (ADR) method suitability.

The AHP was employed to acquire weight, criteria and sub – criteria in each dimension established on the perceptions of the expert. Consecutively (1) financial (0.4598). (2) Organizational (0.3526) (3) Legal (0.1876), respectively are the most significant factors reported. First, the core financial factors include (1) Cost of (ADR) Process (0.450) (2) Cost Minimization technique (0.250) (3) Duration for Dispute Resolution (0.180) (4) Impact of time on Cost (0.120)

**Table 2:** Weight Allocation Of (Adr) Method Suitability Criteria (Outcome Required by The Ahp)

Criteria	Sub- Criteria	Weight	Ranking
Financial (0.4596)	Cost of ADR process	0.450	1
	Cost Minimization technique	0.250	2
	Duration of Dispute Resolution	0.180	3
	Impact of Time on Cost	0.120	4
Organizational (0.3526)	Awareness of ADR method	0.25	1
	Communication of documentation	0.20	2
	Preservation of relationship	0.15	3
	Parties needs to dispute	0.13	4
	Administration of dispute	0.09	5
	Deputation of parties	0.07	6
	Power imbalance	0.06	7
	Quality of outcome	0.05	8
Legal (0.1876)	Certainty of law	0.137	1
	Confidentiality	0.128	2
	Neutrality and enforcement	0.124	3
	Procedural	0.095	4
	Flexibility	0.089	5
	Possibility to appeal	0.087	6
	Maintenance of conflict over dispute	0.088	7
	Settlement process	0.075	8
	Degree of control	0.067	9
	Fairness	0.065	10
	Consensus	0.030	11
	Cost liability	0.020	12

The second rank of critical sub – criteria in organizational criteria is 1) Awareness of ADR method (0.25) (2) Communication and documentation (0.20) (3) Preservation of relationship (0.13) (4) Parties needs to dispute (0.13) (5) Administration of dispute (0.09) (6) Reputation of parties (0.07) (7) Power imbalance (0.06) (8) Quality of outcome (0.05). Then the third rank is the legal aspect that is (1) certainty of Law (0.137) (2) Confidentiality (0.128) (3) Neutrality and Enforcement (0.128) (4) Procedural (0.095) (5) Flexibility (0.089) (6) Possibility to appeal (0.087) (7) Maintenance of Conflict over dispute (0.0893) (8) Settlement process (0.075) (9) Degree of control (0.067) (10) Fairness (0.065) (11) Consensus (0.030) (12) Cost Liability (0.020).

**Discussions**

Findings have shown that the financial factors are the most important in this study, confirming findings by Aritonang and Simanjuntak (2020) <sup>[4]</sup> and Saeto et. al., (2021). The essential sub – criteria for evaluating financial suitability of ADR method are cost of (ADR) process and cost minimization technique. Furthermore, another finding is that the organizational are second important in this study, which confirm Goski (2021) <sup>[6]</sup>. The essential sub – criteria to evaluate suitability of (ADR) method in relation to organizational factors are:

Awareness of ADR method and communication and documentation issues. Ideally disputing parties must have knowledge on the nature of ADR and how it is to be used, this can be achieved through proper communication and documentation. The third and the last ranked (ADR) method suitability factors are the legal factors which confirms Asad et. al. (2022) <sup>[5]</sup>. The essential sub – criteria in this regard are certainty of law and confidential ADR process that parties to a dispute are not allowed to disclose any information or materials to the public unless by mutual consent of the parties. On the other hand (ADR) method of dispute

resolution are non – binding therefore it cannot be enforced upon by the courts unless a written agreement is concluded.

**Implication**

Theoretically, this study supports the AHP results that show the essential suitability factors of (ADR) method, which are financial factors, by considering cost of (ADR) process, cost reduction technique of ADR and the duration of dispute resolution. The organizational factors represent the disputing party’s awareness of each (ADR) strategy, communication and documentation issue related to the process of administering the dispute and lastly the legal factors that include: certainty of law, confidentiality, neutrality and enforceability are critical to suitability of using a particular (ADR) method. The support implication in a nutshell include cost and time efficiency, the lower the cost and shorter time, the more suitable the ADR method. Enforceability, the ability to ensure compliance with ADR outcomes (particularly arbitration) is essential in institutional contexts see AG Federation v AIC Ltd (2000) – Supreme Court of Nigeria on commercial contract enforceability. Local acceptance and trust. Stakeholders’ confidence in the neutrality and integrity of ADR processes. Technical capability, need for domain expertise in resolving highly technical dispute. Legal and institutional support, the extent to which courts and regulatory institutions support ADR (e.g stay of litigation for arbitration) and Flexibility and informality – some disputes benefits from less formal, adaptive processes (e.g. mediation).

**Conclusion**

This research implied that the (ADR) method suitability factors could be categorized into three main criteria, namely: financial, organizational and legal dimensions, through AHP analysis to produce a systematic measuring structure for the level of suitability of (ADR) method. These criteria are thus more declassified into 23 sub – criteria’s which were represented in the assessment questionnaire.

The comparative significance of this sub – criteria was measured applying AHP by the predilections and expectancies of the professional and project stakeholders. Commencing these rankings and loads was calculated and applied as a matrix to encourage decision – making. Their assessment can be implemented for delivering an instrument for (ADR) method bench making performance dispute resolution performance evaluation and developing needs analysis for the disputing parties.

Despite its advantages, ADR adoption in Nigeria faces several legal constraints, such as: low awareness and expertise among local contracting parties, especially in Nigeria States, weak enforcement of ADR outcomes, judicial reluctance to stay litigation or enforce awards quickly, inadequate institution infrastructure, such as arbitration centers or accredited mediators, cultural and social resistance, especially in traditional societies where hierarchical dispute norms persists and absence of statutory adjudication regime, making adjudication purely contractual and sometimes uncertain in enforceability.

There are limitations in this analysis that suggest some future research directions. First, the (ADR) suitability factors are identified by the small sample of construction professions from Bauchi State Public Sector clients. Then the subsequent research should involve a sample of professionals from other States in Nigeria. Second, the

professional sample has a background in ICT and computer networking programs, so that future research is expected to come from various expertise programs which may include online dispute resolution programme.

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