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Alternative Dispute Resolution mechanism and Resolution of Contractual Disputes in Construction Industry: the case of Road Construction Projects in Kenya

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ABSTRACT
Disputes are common in construction industry. Areas of disputes include schedule slippage, delay in payment, quality lapses and scope variations. Disputes constrain relationships between contracting parties, may negatively impact on quality and scope work, could cause poor cash flows, suspension or abandonment of works and even termination of contracts. This research examined use of Alternative Dispute Resolution (ADR) mechanisms to resolve contractual disputes in road construction projects in Kenya. The study also investigated the moderating influence of contract operational environment on the relationship between resolution of contractual disputes and ADR mechanism. A correlation design, regression analysis and analysis of variance were deployed for inferential analysis. The study found out that resolution of contractual disputes has strong positive correlation with ADR mechanism. The regression analysis showed that a unit increase in ADR mechanism yielded several positive units of increase in resolution of contractual disputes. The study concluded ADR mechanism supports consensus building in resolution of contractual disputes and is therefore suitable to be used in the first instance of disputes. The study also concluded that there is significant moderating effect of contract operational environment on the relationship between resolution of contractual disputes and ADR mechanism.
KEYWORDS: *ADR mechanism, Resolution of Contractual Disputes, Contract Operational Environment*

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I. INTRODUCTION

The Contracting parties in construction projects desire fair and agreeable resolutions of contractual disputes (Thomas, 2001). The characteristics of a fair and agreeable resolution include timeliness of the resolution, cost-effectiveness of the resolution, impartiality of resolution, and enforceability of the resolution, among others. Resolution of contractual disputes is an important aspect of road projects management because unresolved disputes are capable of delaying and even stalling the projects (Gillian and Paul,2010). However, whether such resolution is conducted through civil litigation process or ADR mechanism, there are other confounding variables that influence the relationship between resolution of contractual disputes and the method of resolution. For example, construction contracts operate under certain legal environment such the legal framework of the country where the development is being done (Gramberg and Teacher, 2005). A country's legal system is normally supreme and above all other instruments of engagements. Some legal systems and jurisdictions may compel contractual disputes to be solved by certain resolution methods e.g. many jurisdictions have institutes of arbitration to provide solutions outside the formal courts. This study set out to assess how Alternative Dispute Resolution mechanism influences resolution of contractual disputes in road construction projects in Kenya, and to examine the moderating influence of contract operational environment on resolution of contractual disputes in road construction project in Kenya.The study tested the following null hypotheses: i) there is no significant relationship between Alternative Dispute Resolution mechanism and resolution of contractual disputes in road construction projects in Kenya, ii) there is no significant moderating effect of

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contract operational environment on the relationship between ADR mechanism and resolution of contractual disputes in road construction projects in Kenya.

II. LITERATURE REVIEW

Road construction projects are governed by contractual relationship between the employer (owner of the development project) and the contractor (the executor of the project); both of whom are the parties to the Contract. The overriding interest of the employer is to access utility of the development within time, cost and scope definitions specified in the contract; whereas that of the contractor is to get commercial value (profits) on his investment. The two interests are often at conflict (Crabbe and Leroy, 2008) because high utility preferred by the employer is usually costly to the contractor, while the high profit desired by the contractor, ordinarily pre-empts cost minimization behaviors that often undermine utility of the development. Studies such as (Murali and Soon, 2006) of causes of disputes in Malaysian road construction sector found out that performance evaluations of obligations by parties have often given conflicting and biased results which entrench positions of the party sponsoring/doing evaluation. This is common in cases where the party's failure to perform would invoke contractual remedy against him. A similar study carried out in Ghana (Frimpong, Olowoye and Crawford, 2003) concluded that this entrenched biases often result into disputes that usually impact the progress of road projects by deterioration of relationships and delays in the execution of works resulting to high cost of projects.

A review of empirical investigations in Europe, Asia and Africa show that the road construction projects in these regions employ both civil litigation process and ADR mechanism in resolution of contractual disputes, but the selection of its sub- components widely varies. In Europe generally and UK in particular, it is acknowledged that mediation, adjudication, litigation etc. (Gould et al 2010; and Kennedy, 2006) are applicable for resolving disputes in the road construction sector. Over 80% of contractual disputes in the UK road construction since the year 2000, have been resolved through litigation while another 18% have been resolved by arbitration (Dacanster, 2008); leaving only 2% for the other methods. Whereas 90% of disputes in road construction sector handled by litigation have been perceived as successful as measured by parties' satisfaction with assertion of entitlements and enforceability of the awards, there seems to be agreement that evaluation through litigation process took long time to settle contractual disputes, and resulted into poor relationship between the parties in road construction contracts. Contractual disputes that were referred to arbitration tended to take shorter time to resolve (Eversheds, 2005). In the case of Asia; studies in Malaysia (Murali and Soon, 2006), in United Arabs Emirates (Faridi and Sayeges, 2006) and Saudi Arabia (Enshassi et al, 2007) show that litigation is least applied in resolving contractual disputes in road construction projects. 98% of disputes in road construction projects in this part of the world are resolved by either adjudication or dispute review boards while only 2% end up in litigation. However, in Korea and Japan, conciliation seems to be preferred. In India, the use of litigation to resolve contractual disputes in road projects stands at 40% (Iyer and Jha, 2005), and is used as the last resort after failure of other components of judicial evaluation model. The African road construction industry is averse to litigation and arbitration, with the northern region of continent preferring adjudication and dispute review boards as seen in studies in Egypt and Morocco (Elyamany et al, 2007); this is similar to the Asian case. Studies in Sub-Saharan Africa countries such as Nigeria, Ghana and Tanzania (Okuwoga, 1998; Frimpong et al, 2003; and Samson and Lema, 2005) report that mediation and dispute review boards are the most common (at 88%) dispute resolution mechanisms in road construction projects. Studies in South Africa have reported arbitration and litigation as common in resolving road construction disputes (Ugwu and Haupt, 2007).

The study conceptualized the use ADR mechanism to influence outcome resolution of contractual disputes in road construction projects based on the desired characteristics of dispute resolution; which are timeliness of the resolution, cost of dispute, impartiality of resolution and enforceability of the resolution/decision/awards. The relationship is moderated by contract operational environment. The conceptual framework of the study is presented in Figure 1.

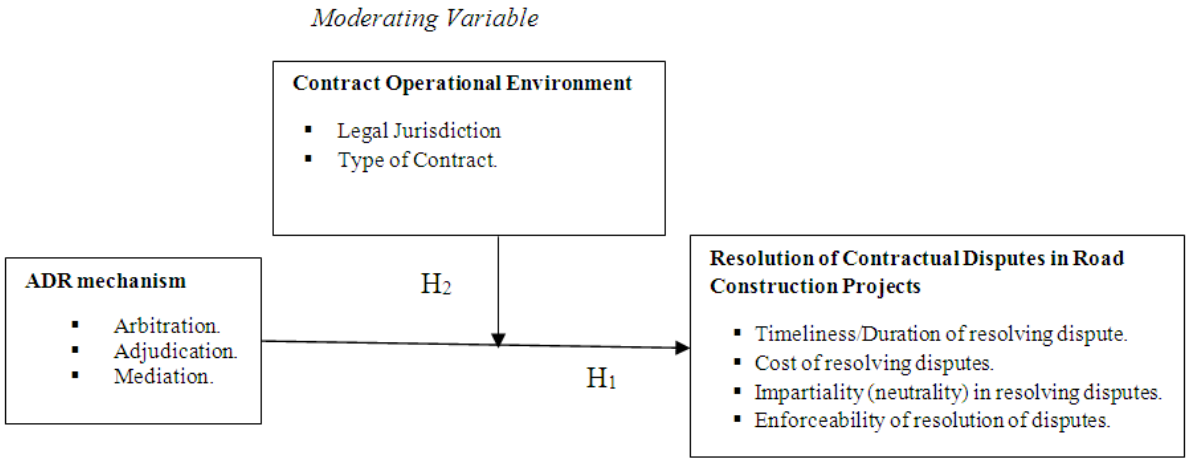

Figure 1: Conceptual Framework of ADR Mechanism and Resolution of Contractual Disputes.

III. METHODOLOGY

The study used correlation design. Measures of central tendency and dispersions were used for descriptive statistics while regression and variance analyses were used for inferential statistics. The target population was 1,017 people drawn from contracts and project evaluation staff in road construction projects in Kenya and stratified into 3 categories of implementation stakeholders: The Employer, the Contractor and the Engineer. The sample size was obtained using Krejcie and Morgan formula for sample size determination at 5% significance level to arrive at a sample size of 279 respondents. A stratified random sample was drawn based on the number of projects for every class of road (Table 1).

Table 1. *Sample Sizes by stratified random sampling.*

Road Construction Projects		**Sample Sizes**			
Class of Road	No. of Projects	Employer	Contractor	Engineer	TOTAL
Class A	35	29	29	29	87
Class B	36	30	30	30	90
Class C	42	34	34	34	102
TOTAL	113	93	93	93	279

The study used self-administered questionnaires to source information. Out of 279 questionnaires that were distributed, 250 were returned representing a return rate of 89.61%. Employer staff returned 86 out of 93 questionnaires which is 92.47% while return rate of questionnaires among Contractor staff was 80 out of 93(86.02%). Engineer staff achieved a return rate of 84 out of 93(90.32%), as shown is Table 2

Table 2. *Questionnaire Return Rate*

Road Projects & Class of Roads	Questionnaire Distribution and Return Rate											
	Employer - distributed and returned			Contractor - distributed and returned			Engineer - distributed and returned			TOTAL - distrubuted and returned		
	Distributed	Returned	% response	Distributed	Returned	% Response	Distributed	Returned	% Response	Distributed	Returned	% Response
Class A	30	30	100.00	29	23	79.31	29	27	93.10	87	80	91.95
Class B	30	30	100.00	30	29	96.67	30	23	76.67	90	82	91.11
Class C	33	26	78.79	34	28	82.35	34	34	100.00	102	88	86.27
TOTAL	93	86	92.47	93	80	86.02	93	84	90.32	279	250	89.61

Primary data was edited for completeness and consistency, coded and classified before feeding into software (Microsoft Excel and SPSS) for analysis.

IV. RESULTS AND DISCUSSIONS

In line with the study objectives, results are discussed under the following themes; desired outcome of resolution of contractual dispute, alternative dispute resolution mechanisms and resolution of contractual disputes in road construction projects, and the moderating influence of contract operational environment on resolution of disputes in road construction projects. Results of correlations analysis and hypothesis testing are also presented.

Desired Outcome of Resolution of Contractual Disputes

Disputes in construction projects should be resolved in time (with speed) and at minimum cost. The dispute should also be resolved with impartiality and the outcome should be enforceable. The study sought to establish what industry players desire as outcomes of resolution of contractual disputes. Desirability of indicators of resolution of dispute (timeliness, cost, impartiality and enforceability) were analyzed on a Likert Scale of 1-5 where Very undesirable (VU) = 1, Undesirable (U) = 2, Sometimes Desirable (SD) = 3, Desirable (D) = 4, Very desirable (VD) = 5. The results were as presented in Table 3

Table 3. *Desired Outcome Resolution of Contractual Disputes*

No.	Desirability statements	n	VD 5	D 4	SD 3	U 2	VU 1	Mean	Std. (±)
(a)	resolution of contractual dispute should be fast/speedy	250	167 (66.8%)	63 (25.2%)	20 (8.0%)	0 (0%)	0 (0%)	4.59	0.636
(b)	Resolution of contractual dispute should be cost effective	250	196 (78.4%)	54 (21.6%)	0 (0%)	0 (0%)	0 (0%)	4.78	0.412
(c)	Resolution of contractual dispute should be impartial	250	233 (89.2%)	11 (4.4%)	16 (6.4%)	0 (0%)	0 (0%)	4.83	0.521
(d)	Resolution of contractual dispute should be enforceable	250	159 (63.6%)	47 (18.8%)	16 (6.4%)	12 (4.8%)	16 (6.4%)	4.27	1.180

Item (a) sought to find out whether resolution of dispute should be done speedily/fast. An affirmative 167 out of 250 (66.8%) said that speedy resolution of contractual dispute was very desirable, 63(25.2%) felt that it was desirable while 20(8.0%) said that speedy resolution of disputes was sometimes desirable. No respondent found speedy resolution of contractual disputes to be undesirable or very undesirable. The mean of 4.59, as a measure of central tendency, indicates the unanimity among the respondents on desirability of speedy resolution of contractual disputes. The standard deviation of ±0.636 shows how minimal the spread from the mean (3.954 to 5.226) of the responses and indicates a high level of agreement among the respondents on time/speed as a desirable characteristic/outcome of resolution of contractual dispute. These findings are in line with Murali and Soon (2006) who, in a study of construction disputes in Malaysia, found out that much construction time was being lost in disputes and industry players were desirous for timely/speedy resolutions.

Item (b) inquired whether resolution of contractual disputes should be cost effective. 100% of the responses indicated that it is desirable or very desirable that contractual disputes should be effective. 196 out of 250 (78.4%) felt that cost effective resolution is very desirable while 54 out of 250(21.6%) reported that cost effective resolution is desirable. The response scored one of the highest mean of 4.78 and the least standard deviation of ±0.412. The findings are therefore affirmative that cost effectiveness in a desirable indicator of resolution. Ahmed et al (2009) in a study of delay in construction projects agree that time and money are important resources in construction projects and affect public perception on deliverability of projects. Any effort that saves time and money of construction projects improves projects' availability and utility.

Item (c) assessed whether resolution of contractual disputes should be impartial. The results indicate that 233(89.2%) of the respondents were of the opinion that it was very desirable that resolution of the dispute is impartial, 11(4.4%) said it was desirable while 16(6.4%) reported that it was sometimes desirable. No respondent reported 'undesirable' and 'very undesirable'. The mean was 4.83 with a standard deviation was ±0.521. This means that there was strong agreement among the respondents that impartiality in resolving contractual disputes is highly desirable. This conclusion supports that of Murally and Soon (2006) who ranked impartiality as the top industry-desired outcomes of resolution of contractual disputes.

Item (d) tested whether resolution of contractual disputes should be enforceable. The findings show that 159(63.6%) of respondents indicated very desirable, 47(18.8%) stated that it was desirable, 16(6.4%) of the respondents said that it was sometimes desirable while 12(4.8%) and 16(6.4%) reported undesirable and very undesirable respectively. The mean was 4.27 and standard deviation was ±1.18. The results show that the desirability level was widely spread along the Likert scale (high standard deviation of ± 1.18 and the lowest mean of 4.27). However, majority of the respondents (82.4%) were of the opinion that the enforceability of resolution of contractual dispute was either desirable or very desirable. Among the four statements that were used to assess resolution of contractual disputes, this is the only statement that recorded undesirable (4.8%) and very undesirable (6.4%) levels of Likert scale. Although their combined percentage (11.2%) is small, it shows

that some respondents are averse to subjecting contractual disputes to the legal force. (Agarwal and Owasonoye, 2011; Ayudhya, 1991) agree that legal force as found in judicial courts leads to adversarial relationship between contracting parties and should only be used as a last resort. It was therefore concluded that resolution of contractual disputes is generally very desirable.

The study ranked the indicators using the measure of central tendency (mean) and measure of dispersion (standard deviation). The ranking conceptualized that the higher the mean, the higher the rank in terms convergence/agreement of the respondents while lower the standard deviation the higher the rank in terms of respondent's convergence. Table 4 shows the findings.

Table 4. *Ranking of Indicators of Resolution of Contractual Disputes*

No.	Desirability statements	*n*	Mean	Rank (based on mean)	Std.Dev (±)	Rank (based on std.)
(a)	resolution of contractual dispute should be fast/speedy	250	4.59	3	0.636	3
(b)	Resolution of contractual dispute should be cost effective	250	4.78	2	0.412	1
(c)	Resolution of contractual dispute should be impartial	250	4.83	1	0.521	2
(d)	Resolution of contractual dispute should be enforceable	250	4.27	4	1.180	4

The findings show that impartiality in resolution of contractual disputes, item (c), ranked first using the mean and second using the standard deviation. Conversely cost effectiveness of resolution of contractual disputes, item (b) was ranked first by standard deviation and second by the mean. This means that the two indicators of resolution of contractual disputes are equally essential. Speedy resolution of contractual disputes, item (a), and enforceable resolution of contractual disputes, item (d) were ranked third and fourth respectively using both mean and standard deviation showing how the two variables are similarly essential. However, all the means were above 4.0 showing that majority of the respondents felt that all the indicators were very desirable hence essential for resolution of contractual disputes in road construction in Kenya.

ADR Mechanism and Resolution of Contractual Disputes

The study investigated the use of ADR (Arbitration, Adjudication and Mediation) in resolution of contractual disputes. The respondents were asked to state how often ADR is used in resolving contractual disputes on a Likert Scale of 'Very frequently'(VF), 'Frequently'(F), 'Neutral(N), 'Rarely' (R) and 'Very rarely '(VR) corresponding to values of 5, 4, 3, 2 and 1 respectively. The results were as given in Table 10.

Table 10. *Use of ADR Mechanism in Resolution of Contractual Disputes*

No.	Statements	n	VF 5	F 4	N 3	R 2	VR 1	Mean	Std. (±)
13(a)	Use of Arbitration to solve contractual disputes	250	29 (11.6%)	42 (16.8%)	179 (71.6%)	0 (0%)	0 (0%)	3.40	0.69
13(b)	Use of Adjudication to solve contractual disputes	250	0 (0%)	104 (41.6%)	69 (27.6%)	61 (24.4%)	16 (6.4%)	3.04	0.96
13(c)	Use of Mediation to solve contractual disputes	250	15 (6.0%)	89 (35.6%)	57 (22.8%)	73 (29.2%)	16 (6.4%)	3.06	1.07

The use of Arbitration was reported as very frequent by 29 (11.6%) respondents, frequently used by 42(16.8%) respondents while 179(71.6%) respondents were neutral. No respondents reported rare of very rare use of arbitration in resolution of contractual disputes. Use of adjudication was reported to be very rare by 16 respondents (6.4%), rare by 61 respondents (24.4%), neutral by 69 (27.6%) and frequent by 104(41.6%) respondents. However, no respondent reported use of adjudication to be very frequent (0%). Use of mediation attracted responses across the scale with 15(6.0%) respondents saying that it was very frequent, 89(35.6%) frequent, 57(22.8%) neutral while rare and very rare recorded 73(29.2%) and 16(6.4%) respectively. The means of responses across the variables were 3.4, 3.04 and 3.06; all tending to neutral (3) which indicate that use of arbitration, adjudication and mediation were equally likely to be deployed or not deployed in resolution of contractual disputes. However, the variability in the standard deviation is such that arbitration has the smallest dispersion from the mean (±0.69) which could qualify arbitration as the most likely consideration for resolution of contractual disputes. These findings concur with those of Glenn (2009), that the influence of ADR mechanism on resolution of contractual disputes differ but can be ranked in a continuum to optimize the dispute outcome.

Pearson product-moment correlation was used to measure the strength and the direction of linear association between alterenative dispute resolution mechanism and resolution of contratual disputes in road construction projects. The results of correlation were as presented in Table 11.

Table 11. *Correlation between ADR mechanism and resolution of Contractual Disputes*

	Resolution of Contractual Disputes	ADR Mechanism
Resolution of Contractual Disputes	1	
ADR Mechanism	0.695	1

The correlation matrix shows that resolution of contractual disputes in road construction projects has a strong positive correlation with ADR mechanism (r = 0.695, p = 0.01) thus suggesting that resolution of contractual disputes is more likely to be achieved through ADR mechanism. Increase in use of ADR mechanism has strong positive influence on resolution of contractual disputes in road construction projects. This finding supports the suitability of ADR mechanism in resolution of contractual disputes in road construction project because resolution process and the outcome are deemed cost effective, fast, and fair. These strengths of ADR mechanism have made the mechanism gain acceptability in resolution of contractual disputes in road construction projects. The correlation suggests that the more ADR mechanism is deployed in resolution of disputes in road construction projects, the more a consensual resolution is likely to be reached.

To determine the influence of ADR mechanism on Resolution of contractual disputes, a linear regression analysis was undertaken, and the model summary of the regression is as given in Table 12.

Table 12. *Regression Model Summary for ADR Mechanism and Resolution of Contractual Disputes*

Model	R	R Square	Adjusted R Square	Std. Error the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F change
1	.695[a]	.583	.490	2.471	.001	15.400	1	248	.019

a. Predictors: (Constant), ADR Mechanism

The R value of 0.695 suggest a high degree of correlation (negative or positive) and R Square value of 0.583 percent indicate that use ADR mechanism explains a significant 58.3% change in resolution of contractual disputes in road construction projects. The remaining 42.7% is explained by other factors. This implies that relationship between ADR mechanism and consensual resolution of contractual disputes is positive and strong

Hypothesis 1

H_0: There is no significant relationship between ADR mechanism and resolution of Contractual disputes in road construction projects in Kenya.

The null hypothesis was tested using ANOVA F-Statistic at 95% confidence level; to either reject or fail to reject at p value = 0.5, level of significance. The results as given in Table 13.

Table 13. *ANOVA Statistic for ADR mechanism and Resolution of Contractual Disputes*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.942	1	0.942	15.400	.019[b]
	Residual	1514.402	248	6.106		
	Total	**1515.344**	**249**			

a. Dependent Variable: Resolution of Contractual Dispute
b. Predictors: (Constant), Alternative Dispute Resolution

The ANOVA F statistic, F (1, 248) = 15.400 at p = 0.019, shows that the regression of ADR mechanism is a significant predictor (since $p < 0.05$) of resolution of contractual disputes. Therefore, the study

rejects the null hypothesis and concludes that there is significant relationship between ADR mechanism and resolution of Contractual disputes in road construction projects in Kenya.

The results of hypothesis test were further confirmed by use of coefficients of regression to assess the influence of alternative dispute resolution mechanism on resolution of contractual disputes in road construction projects. The results were as given in Table 14.

Table 14. *Coefficients Regression of Regression of ADR Mechanism and Resolution of Contractual Disputes*

Model		Unstandardized Coefficient		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	17.154	1.065		16.106	0.000
1	ADR Mechanism	0.520	0.031	0.695	0.393	0.019

Dependent Variable: Resolution of Contractual Dispute

The results show a standardized beta of 0.520 and a constant of 17.154 which when presented in linear relationship of the form, $y = \beta_o + \beta_2 X_2 + \varepsilon$, assuming no error($\varepsilon$) in the model, becomes:

Resolution of contractual dispute = 17.154 + 0.520 ADR Mechanism.

The results imply that a unit increase in use of ADR Mechanism results into 0.520 units of increase/improvement in resolution of contractual disputes. Therefore, increase in the use of ADR mechanism results into a positive improvement in resolution of contractual disputes. the positive relationship between ADR mechanism and resolution of contractual disputes suggests the ability of ADR mechanism to build consensus between parties to a dispute. Although ADR is viewed to be lacking impartiality and enforceability Kumaraswami (1997) explains that this does not mean negative influence but is a demonstration of a value bound evaluation of disputes and consensus building between parties who accept that a win-win model is not synonymous with a 50:50 outcome

Moderating influence of Contract Operational Environment on resolution of contractual disputes

Indicators of contract operational environment were presented to the respondents to rate on Likert scale as strongly agree (SA), agree (A), neutral (N), disagree (D), strongly disagree (SD). The results were as given in Table 23.

Table 23. *Contract Operational Environment, Civil litigation, ADR mechanism and Resolution of Contractual Disputes in Road Construction Projects*

No.	Statements	*n*	SD 1	D 2	N 3	A 4	SA 5	Mean	SD. (±)
9(a)	Applicable law determines selection of dispute resolution method	250	0 (0%)	47 (18.8%)	11 (4.4%)	99 (39.6%)	93 (37.2%)	3.95	0.121
9(b)	Form of Contract determines selection of dispute resolution method	250	0 (0%)	0 (0%)	10 (4.4%)	171 (68.4%)	69 (27.6%)	4.24	0.129

On legal jurisdiction as an indicator of contract operational environment, out of the 250 respondents who participated on the study, none(0%) strongly disagreed, 47(18.8%) disagreed, 11(4.4%) were neutral , 99(39.6%) agreed while 93(37.2%) strongly agreed. Most respondents were affirmative, 99 agreed and 93 strongly agreed, accounting for 192(76.8%). The mean was 3.95 and standard deviation was ±0.121. The mean (3.95) tended to 4 which is an affirmation, although the large standard deviation showed a wide spread of responses suggesting lack of convergence among respondents. The findings showed legal jurisdiction (applicable law) determines selection of disputes resolution method that is deployed to resolve contractual disputes in road construction projects.

On form/type of contract, out of the 250 respondents none (0%) strongly disagree or disagree, 10(4.4%) were neutral, 171(68.4%) agreed and 69(27.6%) strongly agreed. The modal response was 4(agree) at 171(68.4%) which is a strong affirmation. The mean was 4.24 signifying strong agreement that type of contract determines selection of dispute resolution method. The standard deviation was ±0.129 showing high convergence among respondents. The study therefore affirmed agreement among sample respondents that type

of contract environment determines selection of dispute resolution method used in resolving contractual disputes in road construction projects.

Contract operational is therefore deemed to have moderating effect on the relationship between civil litigation, ADR mechanism and resolution of contractual disputes in road construction projects by determining the method of dispute resolution. Noushad (2006) agrees that external environment of the contract is a key factor in the choice of dispute resolution approach because it defines the first approach the parties adopt towards resolving disputes. Whereas all dispute resolution methods are subservient to the applicable law, a contract can prescribe which method of resolution should be used in contractual disputes in a road construction project.

Pearson product-moment correlation was used to measure the strength and the direction of linear association of contract operational environement, civil litigation, ADR mechanism and resolution of contratual disputes. The results of correlation were as presented in Table 24.

Table 24: *Correlation of Contract Operational Environment, ADR mechanism and Resolution of Contractual Disputes*

	Resolution of Contractual Disputes	ADR Mechanism	Contract Operational Environment
Resolution of Contractual Disputes	1		
ADR Mechanism	0.695	1	
Contract Operational Environment	0.305	0.065	1

The correlation matrix shows that contract operational environment has a near moderate positive correlation (r = 0.305, p = 0.01) with resolution of contractual disputes in road construction projects and a week positive correlation (r = 0.065, p = 0.01) with ADR mechanism. To determine the moderating influence of contract operational environment on relationship between ADR mechanism and resolution of contractual disputes, regression analysis was carried out. The model summary of the regression was as presented in Table 25.

Table 25: *Regression Model Summary for Contract Operational Environment ADR mechanism and Resolution of Contractual Disputes*

Model	R	R Square	Adjusted R Square	Std. Error the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F change
1	0.631[a]	0.401	-0.005	2.474	0.007	5.48	2	247	0.050

a. Predictors: (Constant), Contract Operational Environment, Alternative Dispute Resolution, Litigation

The R value of 0.631 indicates moderate degree of correlation (negative or positive) of contract operation environment and the relationship ADR mechanism and resolution of contractual disputes in road construction projects. R Square value of 0.401 indicates that the moderating influence of contract operational environment on the relationship of ADR mechanism and resolution of contractual disputes explains 40.1% change in resolution of contractual disputes in road construction projects.

Hypothesis 2

H_0: There is no significant moderating effect of Contract Operational Environment on relationship between civil litigation, ADR mechanism and resolution of contractual disputes in road construction projects in Kenya.

The null hypothesis was tested using ANOVA F-Statistic at 95% confidence level; to either reject or fail to reject at p value, p = 0.5, level of significance. The results of the test were presented in Table 26.

Table 26: *ANOVA Statistics for Contract Operational Environment, Civil litigation ADR mechanism and Resolution of Contractual Disputes*

Model		Sum of Squares	df	Mean Square	F	Sig.
1						
	Regression	10.053	2	3.351	5.481	.050[b]
	Residual	1505.291	247	6.119		

Total	**1515.344**	**249**	

a. Dependent Variable: Resolution of Contractual Dispute

b. Predictors: (Constant), Contract Operational Environment, Alternative Dispute Resolution, Litigation

The ANOVA F-statistic; F (3, 246) = 5.481 at p = 0.050 shows that the regression of contract operational environment is a significant moderator ($p \leq 0.05$) of the relationship between civil litigation, ADR mechanism and resolution of contractual disputes in road construction projects. Therefore, the study rejects the null hypothesis and concludes that there is significant moderating effect of contract operational environment on the relationship between civil litigation, ADR mechanism and resolution of contractual disputes in road construction projects in Kenya.

The results of hypothesis test were further confirmed by use of coefficients of the regression to assess the moderating influence of contract operational environment on the relationship between civil litigation , ADR mechanism on resolution of contractual disputes in road construction projects and the results were as given in Table 27.

Table 27. *Coefficients of Regression of Contract Operational Environment, Civil litigation, ADR mechanism, and Resolution of Contractual Disputes*

Model		Unstandardized Coefficient		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.106	1.973		8.669	.000
	ADR Mechanism	.601	.032	.039	.597	.551
	Contract Operational Environment	.036	.036	.064	.986	.325

Dependent Variable: Resolution of Contractual Dispute

The results gave a standardized beta values of 0.601 for ADR mechanism, 0.036 for contract operation environment and a constant of 17.106. If plotted in a multiple linear relationship of the form, $y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$, assuming the error term (ε) is zero, becomes:

Resolution of contractual dispute = 17.106 + 0.601 ADR mechanism + 0.036 Contract Operational Environment.

The regression model demonstrates that, with the moderating influence of contract operation environment, a unit increase in ADR mechanism results into 0.601 units increase/improvement in resolution of contractual disputes, while a unit increase in contract operational environment itself causes 0.036 units increase resolution of contractual disputes. The constant standardized beta coefficient is 17.106.

From the above findings, it is observed that standard beta coefficient of ADR mechanism has changed from 0.520 (without influence of contract operating environment) to 0.601 (with influence of contract operating environment) but the beta constant has reduced from 18.102 to 17.106. This suggests that contract operational environment has a positive change and moderating influence on the relationship between and ADR mechanism and resolution of contractual disputes. These findings agree with those of Noushad (2006) that external environment is a key factor in the choice of disputes resolution method. Kodagoda (2008) and Madden (2001) respectively state that legal environment and form/type of contract either determine or prescribe approaches to dispute resolution in road construction projects.

V. CONCLUSION

ADR mechanism has a strong positive influence on resolution of construction disputes in road construction projects in Kenya. Its components, arbitration, adjudication, and mediation are flexible and helps parties build consensus and therefore reduce time and cost of dispute resolution. To reduce cost and time, disputes should be resolved by use of ADR mechanism in the first instance before they are subjected to civil litigation process as a last resort.

Contract operational environment influences the relationship between ADR mechanism and resolution of contractual disputes either by preferring a method of resolution of dispute through the applicable law or prescribing the method of dispute resolution through the form of contract.

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