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## The Impact of Construction Dispute on Projects in the Mpumalanga Province of South Africa

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### Abstract

Construction disputes have a greater effects on the construction industry as opposed to other industries. Especially negative effects are prevalent on the project participants which lead to poor execution of the project. The study investigated the impact of disputes in construction projects in the Mpumalanga Province. The data used in this paper were derived from both primary and secondary sources. The secondary data was collected via a detailed review of related literature. The primary data was collected through a survey questionnaire which was distributed to project participants. Out of the 90 questionnaires sent out, 80 were received back representing 89% response rate. Data received from the questionnaires were analysed using descriptive statistics procedures such as Ms Excel and SPSS software. Findings from the study revealed that; bad relationship between parties, loss of productivity, cost and time overruns, loss of company reputation, loss of professional reputation delayed payment and rework were the main effects of construction disputes in construction projects. Therefore, construction dispute have an effect on most of the project participants which may lead to poor execution, reduced profit margins and budget escalation. Hence Dispute must be resolved as soon as possible to avoid mostly all the effect they have on projects and stakeholders. Furthermore, risk have been identified to be associated with construction dispute, if risk are well managed the occurrence of construction dispute will be reduced.

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### 1. Introduction

Disputes are prone during construction due to the problem of contractual terms such as payment, variation, and extension of time and the unavailability of information [1]. Construction Projects are often delivered under a complex and uncertain environment, with claims being an inevitable part [2]. Construction disputes materialise when construction claims are not settled in an effective, economical and timely manner [3]. However, resolving disputes can be expensive and time consuming. It is therefore, crucial to manage disputes proactively to ensure that early settlement is achieved [4]. Any stakeholders in the construction project can generate dispute (including client, professional consultants, contractors, subcontractors) through their level of knowledge of the construction process. Furthermore, the more complex the project is, the higher the probability of dispute causation [5]. Disputes have become an endemic

feature of the Mpumalanga construction industry. Hence, this research aims to investigate the causes of disputes in construction projects in the Mpumalanga Province of South Africa.

## **2. Construction Industry**

The construction industry (CI) in many countries is a key component of economic growth. Furthermore, the construction industry plays even a greater role in development and poverty alleviation by providing access to basic services and transport facilities in the developing countries [6]. The CI is an important sector of the economy because of the outputs of its activities [2]. It contributes to national socio-economic development by providing the buildings which are used in the production of all goods in the economy. The CI is one of the most diverse and unstable sectors within the economy [1]. It faces fluctuation demand cycles, project- specific product demands, uncertain production conditions and it combines a diverse range of specialist skills within geographically dispersed short term project environments [3]. However, anything that impacts on construction industry has potential to affect the whole economy. Since, it's unique and complex to other industries and it involves many participants in all trends, due to this, conflict and disputes can easily occur for example; through changes in plans, quantities, or details of construction which are inherent in the nature of construction [7].

## **3. Disputes in the construction industry**

The occurrence of construction disputes can lead to negative impact towards client organisation, furthermore, carelessness and negligence in construction has risen to greater prominence [1]. Dispute between client and contractor will impact work progress since it will be slow, subsequently, the cash flow suffers terrible [3]. Construction is procured and completed in a manner which lends its self to numerous potential disputes. The procurement process includes an owner's version, selection and completion of a formal design, selection of a construction team which usually includes many specialist subcontractor and suppliers sometimes, and ultimately building commissioning and turnover [4]. Depending on the type of facility constructed, the whole process can take years. During these time personnel will change, the economy will change and technology will change. With almost 100% certainty, that won't change is the fact that something will not go according to plan during the project and dispute will arise [8].

## **4. Disputes defined**

Dispute is the opposition of interest, values or objectives and is the formation of a position to maintain conflict [9]. Furthermore, dispute according [10], can be viewed as a class or kind of conflict that requires resolution. Another definition according to [1], dispute does not exist until a claim has been submitted and rejected, a claim being a request for compensation for damages incurred by any party to the contract. Dispute is a problem or disagreement between the parties to a contract, that cannot be resolved by on jobsite or on-site project managers [11]. Many authors argue that the most common protracted dispute arises when a contractor make a claim for an increase in the contract sum which is rejected by the project managers and the contractor formally notifies that it does not accept the decision by the project manager. Dispute can be caused by negligence in understanding the terms of the contract for example dispute on misunderstanding and disputes on interpretation of clauses [12].

## **5. Risk and uncertainty**

According to [13] as cited by [6] claimed that construction projects are sensitive to risk and construction risk are associated to construction dispute. The risk listed below can be found in a normal construction contract and they are associated to causes of dispute. According to Zack [13], risk are allocated well in the construction contract such as capability – Physical risks, act of God, suspension of works, untimely responses, union strike, engineering and construction risk, changes, contractor furnished equipment/ material , continuation of work, coordination, defective contract documents, interpretation of requirements, means and methods of construction, owner furnished equipment materials, permits and licences, productivity, site safety, work quality, impractical /impossibility, latent site conditions,

quantity variations, site access, weather, capability related risks, defective works, labour forces, subcontractor, supplier failure, economic risks, bonding, contract termination, cost escalation, economic disaster, failure to pay, insurance, project funding, taxes, time related risks, acceleration, delays and disruptions and early use of facility. Therefore, comparing these risk factors with causes of dispute in the table below it is noticed that these risk are included as causes of dispute. Furthermore, this propose when risk surface in a project and are not cured correctly the risk will give rise to dispute. Hence, risk allocation may be achieved through the combination of risk retention, risk avoidance, risk reduction or by transferring the risk to any party that has competency and expertise for best assessing, managing and minimizing it [14]. Therefore risk management is highly recommend in the dispute avoidance [15].

## 6. Causes of disputes in the construction industry

### 6.1. Summary of dispute causation

The construction industry is a complex and competitive environment in which participant with different views, talents and levels of knowledge of the construction process work together [1]. Hence the construction value chain means more business interaction and arguments, whether contractual or social, resulting in an increase in the number of construction disputes [11]. Table 1 summaries the cause of disputes.

**Table 1:** Causes of disputes in the construction industry (Adapted from Kumaraswamy & Yogeswaran [11])

Categories of disputes	Causes of disputes	Authors
Owner related	Variations initiated by the owners Change of scope Late giving of possession Acceleration Unrealistic expectations Payment delays	Blake Dawson Waldron (2006), Kumaraswamy (1997) and diekman et al. (1994)
Design related	Design quality Inadequate/ incomplete specification Quality of the design Availability of information	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)
Contract related	Risk allocation Different interpretations of the contract provisions Ambiguities in contract document Other contractual problems	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)
Contractor related	Financial failure of the contractor Delay in work progress Tendering Quality of works Technical inadequacy of the contractor Extensions of time	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)
Human behaviour related	Adversarial/ controversial culture Lack of team spirit Team spirit	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)
Project related	Site conditions Unforeseen changes	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)
External Factors	Weather condition Legal and economic factors Fragmented structure of the sector	Blake Dawson Waldron (2006), Yiu and Cheung (2004), Kumaraswamy (1997) and Conlin et al., (1996)

From the above table it is evident that the root causes of dispute they are more or less the same from different countries and are associated with risk. Moreover, the study on dispute clearly shows how big and diverse the construction industry including the culture. Therefore, risk if timely managed well the occurrence of dispute could be minimised and also risk must be transferred to a party that is competent in assessing, analysing and minimize them. The following table will list the contributors to construction dispute.

Table 2: contributors to dispute

Contributors to construction dispute	sources
People, process and product	[16]

Management, culture, communications, design, economics, tendering pressure, law, unrealistic expectations, contract and workshop	[17]
Technical, legal and managerial dispute issues must have a contractual reference	[18]
Construction contracts and unpredictable events	[19]

## 7. Effects of disputes in construction companies

Construction disputes affect all stakeholders and contribute to inequitable mode of project delivery such as reduced margins, increased costs and even reduced the quality and levels of service [2]. Most disputes which are of minor nature should be settled quickly, fairly and amicably by the construction team [20]. However, from time to time, more serious issues come into disputes and when this happens the building team should make means to reach a fair settlement by negotiation or other means of dispute resolution mechanisms available which are mediation, arbitration, amongst others. The consequences of construction disputes will not benefit the stakeholders in the construction project [3]. Moreover, disputes may affect cash flows (disputes, affect insurance coverage (liability risk exposure), insurance rates (indemnity payment and cost of settling claims), overheads (personal time to defend and settle, plus attorney's fees) and reputation (publicity from large suits) [21].

Therefore, the effects of construction disputes in an organisation can be summarised as follows:

- Loss of productivity
- High tender prices
- Loss of professional reputation
- Loss of company reputation
- Time delays
- Cost overruns
- Cash flow
- Insurance coverage
- Liability risk exposure
- Additional expense in managerial and administration
- Possibility of litigation cases
- Loss of business viability
- Loss of profitability
- Extended and/ or More complex award process
- Break down in cooperation between parties
- Diminution of respect between parties and deterioration of relationship and break down in cooperation
- Additional expense in administration
- Rework and
- Relocation cost for men, equipment and materials

Since some disputes are not avoidable, proper management of conflict and risk will ease the effect it has on the construction process, however resolution should follow quickly. Disputes have a greater effect on the construction projects as opposed to other industries. Construction disputes have an effect on most of the project participants which may lead to poor execution of the project, for example, reduced margins, budget escalation and low quality of work [21].

## 8. Research Methodology

### 8.1. Research area

Mpumalanga means the place of the rising sun and people are drawn to the province by its magnificent scenery, fauna and flora. The province is the second smallest province in South Africa yet it has fourth –largest economy. It's situated mainly on the high plateau grasslands of the middleveld. Mpumalanga has network of excellent roads and railway connections thus making it highly accessible [22]. The province is a tourism destination and it's a home, of over 4 million people, the principal languages are siSwati and isiZulu. The province is a summer-rainfall area divided by the

escarpment into the Highveld region with cold frosty winter and lowveld region with mild winters and subtropical climate. Mpumalanga is the second largest citrus producing area in South Africa and is responsible for one third of the country's export in oranges. Mpumalanga is very rich in coal reserves. The province house the country three major power stations, of which are the largest in the southern hemisphere [22].

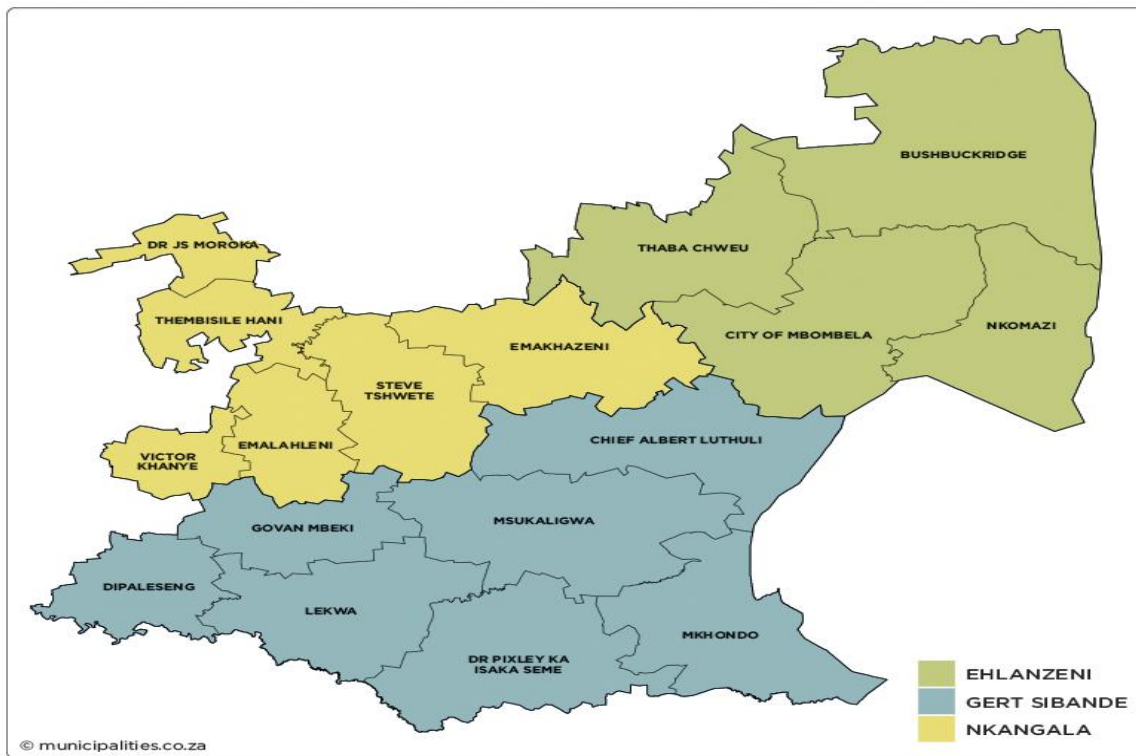


Figure 1: Mpumalanga map

### 8.2. Research approach and design

Quantitative approach method was adopted to investigate a stakeholder's perspective on the impact of disputes in the construction industry of Mpumalanga Province of South Africa. The study was carried out in Mpumalanga Province of the Republic of South Africa. 90 Questionnaires were distributed and 80 were brought back which were all valid and usable. A well-structured questionnaire was distributed to different construction companies in Mpumalanga Province, amongst construction professionals such as civil engineers, project managers, directors, quantity surveyors, construction managers and contractors who are register on the CIDB data base. The questionnaires were sent via e-mails, some were delivered to the known construction companies by the researcher and some were distributed during site clarification meetings of contractors and consultants bidders in Mpumalanga Province. The study was conducted from reliable scholarly sources such as articles, journals, books, publications, websites and site experience on the field.

### 8.3. Statistical package for the social science (SPSS)

The quantitative data collected was analysed with Statistical Package for the Social Science (SPSS) a computer programme which is used for analysing data concerned with social phenomena. The software was used to generate various statistical, including descriptive statistic, which provides a basic summary of all variables in the data [23]. The benefits of using SPSS is that it allows for scoring and analysing quantitative data at speed and it can also be used to perform multivariate analysis. SPSS also helps to present the data in a logical format [23] thereby reducing time spent on calculating scores. However, accuracy in results is highly dependent on inputs, hence the need to accurately capture data from the questionnaire.

### 8.4. Point likert scale

5- point linkert scale was adopted for the study which gave a wider range of possible scores and increase statistical analyses that are available to the researcher. The first linkert scale read is on agreement form as follows:

- 1- Strongly Disagree (SD)
- 2- Disagree (D)
- 3- Neutral (N)
- 4- Agree (A)
- 5- Strongly Agree (SA)

The second linkert scale read is on likelihood as follows:

- 1- Extremely Unlikely (EU)
- 2- Unlikely (U)
- 3- Neutral (N)
- 4- Likely (L)
- 5- Extremely Likely (EL)

The 5 point scales were transformed to mean item score abbreviated as (MIS).

#### 8.5. Computation of the mean item score (MIS)

The computation of the mean item score (MIS) was calculated from the total of all weighted responses and then relating it to the total responses on a particular aspect. The mean item score was adopted to rank the factors from highest to lowest. The Mean Item Score (MIS) is expressed and calculated for each item as follows:

$$\text{MIS} = \frac{1n1 + 2n2 + 3n3 + 4n4 + 5n5}{\sum N} \quad (1)$$

Where;

- n1 = number of respondents for strongly disagree
- n2 = number of respondents for disagree
- n3 = number of respondents for neutral
- n4 = number of respondents for agree
- n5 = number of respondents for strongly agree
- N = Total number of respondents

## 9. Findings

### 9.1. Risk factors contributing to construction dispute

Figure 2 reveals that 45% of respondent strongly agree that once risk surfaces or appear in a project dispute will definitely occur, 21% of respondent agree, 9% of the respondent are neutral, 14% disagree and 11% of the respondent strongly disagree.

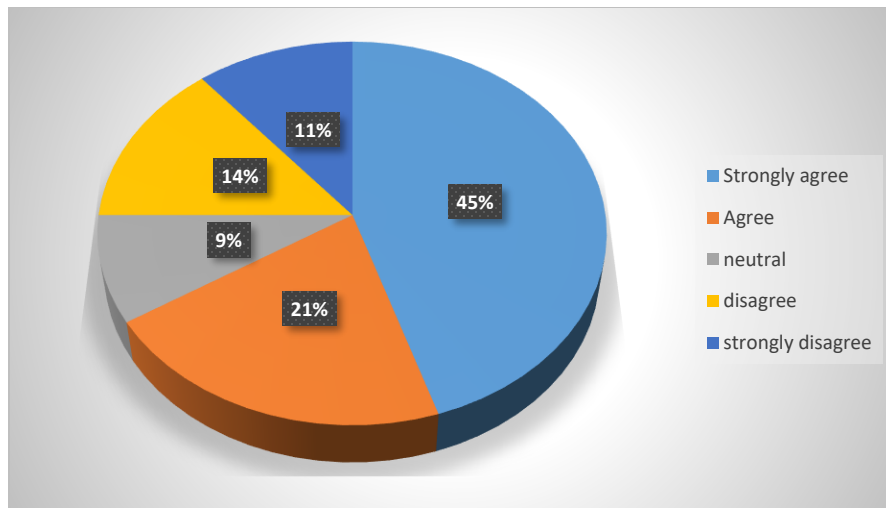


Figure 2: Risk factor contributing to dispute

9.2. *Effects of disputes in the South African construction projects*

Table 3 reveals the respondent’s ranking of effects of disputes in Mpumalanga province, South Africa. Loss of profitability was ranked first with (MIS=4.41 & STD=1.125); followed by Break down in cooperation between parties which was ranked second with (MIS=4.38 & STD=1.104); Loss of business viability which was ranked third with (MIS=4.36 & STD=0.995); Loss of professional reputation which was ranked fourth with (MIS=4.33 & STD=1.130); Loss of productivity was ranked fifth with (MIS=4.25 & STD=1.025); Cost overruns was ranked sixth with (MIS=4.19 & STD=0.938); Time delays was ranked seventh with (MIS=4.02 & STD=1.138); Loss of company reputation was ranked eighth with (MIS=3.98 & STD=0.897); Rework/ repetition of work was ranked ninth with (MIS=3.96 & STD=1.064); Additional Expense in administration was ranked tenth with (MIS=3.78 & STD=0.989); Diminution of respect between parties was ranked eleventh with (MIS=3.69 & STD=1.093); Relocation of Equipment was ranked twelve with (MIS=3.62 & STD=1.175); Relocation of Material was ranked thirteen with (MIS=3.56 & STD=1.114); Relocation cost of workers/ labors was ranked fourteen with (MIS=3.48 & STD=1.094) and Additional Managers cost was ranked last with (MIS=3.43 & STD=1.058).

**Table 3.** Effects of construction disputes

Factors	$\bar{x}$	$\sigma X$	R
Loss of profitability	4.41	1.125	1
Break down in cooperation between parties	4.38	1.104	2
Loss of business viability	4.36	0.995	3
Loss of professional reputation	4.33	1.130	4
Loss of productivity	4.25	1.025	5
Cost overruns	4.19	0.938	6
Time delays	4.02	1.138	7
Loss of company reputation	3.98	0.897	8
Rework/ repetition of work	3.96	1.064	9
Additional Expense in administration	3.78	0.989	10
Diminution of respect between parties	3.69	1.093	11
Relocation of Equipment	3.62	1.175	12
Relocation of Material	3.56	1.114	13
Relocation cost of workers/ labors	3.48	1.094	14
Additional Managers cost	3.43	1.058	15

$\sigma X$  = Standard deviation;  $\bar{x}$  = Mean item score; R = Rank

9.3. *Contributors to construction dispute*

Respondent were asked based on their experience as to which factor contribute highly to the occurrence of dispute in construction project. Communication and people were ranked first with (MIS=4,15 & STD=0,82, &0.94 respectively); unrealistic expectations was ranked second with (MIS=3,98 & STD=0,99); management and culture were ranked third with (MIS=3,96 & STD=1,08 &0.98 respectively); tendering pressure was ranked fourth with (MIS=3,87 & STD=1,013); design was ranked fifth with (MIS=3,83 & STD=1,02); economics was ranked sixth with (MIS=3,78 & STD=0,96); law and contract were ranked seventh with (MIS=3,74 & STD=0,97 & 0.93 respectively); workshops was

ranked eight with (MIS=3,65 & STD=1,1); Technical and Legal were ranked nine with (MIS=3,48 & STD=1,15 & 0.95 respectively); unpredictable events was ranked last with (MIS=3,39 & STD=0,975).

Table 4: contributors to dispute

Contributors to construction disputes	$\bar{x}$	$\sigma X$	R
communication	4,15	0,82	1
people	4,15	0,94	1
unrealistic expectations	3,98	0,99	2
management	3,96	1,08	3
culture	3,96	0,98	3
tendering pressure	3,87	1,013	4
design	3,83	1,02	5
economics	3,78	0,96	6
law	3,74	0,97	7
contracts	3,74	0,93	7
workshops	3,65	1,1	8
Technical	3,48	1,15	9
Legal	3,48	0,95	9
unpredictable events	3,39	0,975	10

$\sigma X$  = Standard deviation;  $\bar{x}$  = Mean item score; R = Rank

#### 9.4. Strategies to minimize construction disputes

Respondents were asked on the strategies to minimize construction disputes in construction projects in Mpumalanga Province. Most respondents, ranked Stakeholder management and alliancing first with (MIS=3.45; STD=1.151 and 1.203 respectively); Lean construction was ranked second with (MIS=3.38; STD=1.058); Partnering was ranked third with (MIS=3.22; STD=1.213); Supply chain management was ranked fourth with (MIS=3.20; STD=0.989) Relational contracting was ranked fifth with (MIS=3.05; STD=1.015); Lastly Alignment with (MIS=2.98; STD=1.249).

Table 5: Strategies of minimizing construction disputes

Strategies of minimizing disputes	$\bar{x}$	$\sigma X$	R
Stakeholder management	3.45	1.151	1
Alliancing	3.45	1.203	1
Lean construction	3.38	1.058	2
Partnering	3.22	1.213	3
Supply chain management	3.20	0.989	4
Relational contracting	3.05	1.015	5
Alignment	2.98	1.249	6

$\sigma X$  = Standard deviation;  $\bar{x}$  = Mean item score; R = Rank

## 10. Conclusions

Findings from the current study proves that there is a higher incidences of construction dispute in the Mpumalanga region which are caused by poor communication among stakeholders, people, and unrealistic expectation from the client, tendering pressure from the contractors side. The impact of dispute on construction project causes loss of profitability, breakdown in co-operation between parties, the impact on business viability is very bad because companies go bankrupt and shut down, because they cant operate anymore, loss of professional reputation, loss of productivity and cost overruns (delayed payment will occur and project cost will increase with time extension, material increases). To decrease the occurrence of dispute in a project, dispute avoidance strategies have to used such as stakeholders management, alliancing, lean construction, Partnering. Early involvement in the decision making process



by the key stakeholders including the clients, contractors and building users is normal the best strategy. Pro-active project environment can be created in which change management is an acceptable tool. Furthermore, to avoid the bad impact the dispute has on projects and the companies risk should be managed and minimised. Therefore, risk must be managed well and also must be transferred to a party that is competent in assessing, analysing and minimize them, hence the early involvement of all the parties is highly recommended. Hence people must be managed well to reduce dispute, because they play a huge part in the productivity and profitability of the project. So People do have an impact to the project as whole.

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