FACTORS AFFECTING THE MAIN CONTRACTOR-SUBCONTRACTOR RELATIONSHIP IN THE ZAMBIAN CONSTRUCTION INDUSTRY

Tafadzwa Mudzvokorwa[1], Balimu Mwiya[2] and Erastus M. Mwanaumo[2]
[1]MEng Student in Project Management, Department of Civil & Environmental Engineering, University of Zambia, Email: tafmud@gmail.com
[2]Department of Civil & Environmental Engineering, University of Zambia

ABSTRACT

In recent years there has been a substantial number of projects conducted in the Zambian construction industry. Due to the magnitude and complexity of many of these projects, contractors have resorted to subcontracting to share responsibilities and mitigate project risks. The Zambian government has also invigorated the practice of subcontracting in the construction industry as it plays an imperative role in increasing economy viability and development of local contractors. Ministerial Statement on July 25, 2012 directed RDA to ensure minimum of 20 percent sub-contracting on all major road contracts to Zambian-Owned Companies. Instead of improving project success, subcontracting can act as a catalyst for poor project outcomes. Though there are many reasons that contribute to problems from subcontracting, a strained relationship between main contractors and subcontractors can be seen as a notorious contributor to poor project outcome. The study aimed at investigating the relationship between main contractors and subcontractors in Zambia, establish factors leading to interface problems and those factor that can help improve this relationship. Questionnaire survey was adopted in order to collect data and investigate the relationship. A total of 80 questionnaires were distributed. The questionnaires were distributed by hand and via email. Out of the targeted 80 respondents 56 responded, giving a response rate of 70 percent. The study established that the relationship between main contractors and subcontractors in Zambia needed to improve, as it was not in an effective state. Interface problems were caused by payment issues, poor communication, unexpected price escalations and poor construction work. In order to address interface problems, the study found that there was need for better communication between the parties, timely payments and subcontractors' access to labour and machinery.

Keywords: Construction Indusry, Main contractor, Subcontractor, Relationship, Zambia

INTRODUCTION

The construction industry contributes significantly towards the economic output of a country (Mirawati et al., 2015). Zambia's construction industry comprised 9.9 percent of the national Gross Domestic Product (GDP), with a growth rate of 8.9 percent from 2013 (CSO, 2016). A pivotal aspect of projects in the construction industry is subcontracting (Ujene et al, 2011). Research has shown that currently up to 90 percent of the work on a construction project is performed by subcontractors (Rajput and Agarwal, 2015). Contractors exert to subcontracting, to allow for specialisation, reduce work load and limit risk exposure (Abdullahi, 2014). Manu et al., (2013) indicated that subcontracting is a means to bargain down labour cost, encourage quicker completion of tasks, externalise less rewarding and dangerous activities and rapidly meet changing product market demands.

With all its benefits, subcontracting is a risk to construction projects (Yoke-Lian et al, 2013). A major aspect that contributes to the degree of success or failure of projects which are subcontracted is the relationship between main contractors and subcontractors (Jin et al., 2013; Okunlola, 2015; White & Marasini, 2014). The relationship can lack of cooperation, trust, and communication (Mirawati et al., 2015). This kind of relationship induces project delays, cost overruns, litigations, and compromise project quality. However, a better interface between project parties encourages project success or even improve project performance (Vilasini et al, 2012; Eriksson and Westerberg, 2011). A good relationship between main and subcontractors is key to skills transfer from bigger well-established main contractors to small local subcontractors (CIBD, 2013).

Efforts to foster subcontractor growth in Zambia through the RDA 20 per cent subcontracting policy

have encountered various challenges (Phiri, 2016). Phiri (2016) observed that subcontractors were not benefiting in terms of capacity building since foreign contractors were not willing to do so as there was no incentive. Saasa, (2018) added that the transfer of technology or skills development is not working because RDA nominates political cadres with no qualifications and knowledge in construction but may produce NCC registration certificate. The politically inclined beneficiaries normally would trade-off the 20 percent with Chinese contractors. A study by Kaliba (2010) revealed that subcontracting contributes to project schedule overruns. Evidently, attention is required on subcontracting in the construction sector to foster structural change and industrial development in Zambia. The objectives of this research were to:

1. Determine the nature of the relationship between main contractors and subcontractors in Zambia and how it is affecting projects.
2. Establish the factors that lead to contention between subcontractors and main contractors in Zambia.
3. Establish factors that contribute to an effective interface between subcontractors and main contractors in Zambia.
4. Suggest possible options that can be followed to ensure relationship between main contractors and subcontractors in Zambia support the attainment project goals

LITERATURE REVIEW

Subcontracting is a means used by main contractors to deal with uncertainties in the construction market and transfer risks. Subcontracting allows main contractors to use more competitive local firms with their lower overhead costs and better knowledge of the local conditions and procedures (CIDB, 2013). However, because of the increased dependence on subcontracting in the construction industry, the operational relationship between main contractors and subcontractor plays an imperative role in successful project delivery (Okunlola, 2015; Akintan & Morledge, 2013).

The construction industry supply chain relationships are quite diverse, among which three distinct forms; the traditional relationship, the project partnering relationship and strategic partnering relationship (Meng, 2012). The traditional relationship is a purely contractual relationship. It is often criticised as it can lead to selfish objectives, poor communication, a lack of trust among the parties, confrontations, problem escalation, and a lack of continuous improvement (Akintan & Morledge, 2013). Partnering is encouraged by many researchers because it is recognised as a collaborative supply chain relationship (Meng, 2012). A partnering relationship is based on mutual trust, dedication to common goals, communication, long-term perspectives, problem solving and an understanding of each other's individual expectations and value (Mirawati et al., 2015). Partnering can be classified into project partnering focused on a single project and strategic partnering based on multiple projects.

Factors Contributing to Relationship Challenges

Many factors have been identified by researchers as the causes to an ineffectual interface between the main contractor and the subcontractor in projects. Payment issues have been recognised as a major factor affecting the subcontractor-main contractor relationship. In some cases, the contractor is perceived a poor paymaster and this will complicate the relationship even further (Okunlola, 2015). Multilayer subcontracting is the further subcontracting downstream by subcontractors, with or without the knowledge or consent of the general contractor or client. This practice affects the interface between main contractor and subcontractor (Abdullahi, 2014; Yoke-Lian et al, 2012). Andy NG and Price, (2010) found that the most important causes were management system related problems especially communication. These causes were above technical related causes and staffing related causes.

The Construction Industry Development Board South Africa, (2013) noted that bid shopping damaged the relationship between main contractors and subcontractors, leading to subcontractors refusing to bid for a contractor known for bid shopping. The relationship is also affected the contractual structure of the traditional procurement, which excludes subcontractors from the main contract (Akintan& Morledge, 2013). Mortaheb et al, (2010) identified that change of government laws and regulations over the construction industry can affect the relationship

between project parties. Issues such as taxation and licenses can affect, the work done by a main contractor or a subcontractor on a project.
Mortaheb et al, (2010) listed a number of impacts that arise from poor interfaces between project parties in mega oil refinery projects in Iran. With the use of interviews and questionnaires different viewpoints of owners, contractors, and consultants were collected. From these viewpoints impacts collected are as follows: time overrun in terms of delay; cost overrun; poor project quality; disputes between different project parties; arbitration; suspension of the work or contract termination; and litigation.

General Solutions to Interface Problems

Akintan and Morledge (2013) suggested the Last Planner System Approach (LPS) as a means of managing challenges between main contractors and subcontractors. The last planner system approach is a production tool developed to improve planning on construction projects. Its essential objective is to build trust amongst project participants using factors such as: collective pull-based planning, measurement, learning, and continual improvement. Mignot (2011) advised that project participants need to eradicate stereotypes, ideologies and do away with their professional delineations to be able to trust one another. Jin et al (2013) noticed that many interface problems are often linked to the imbalance of power existent in the relationship. Despite subcontractors being vital to the main contractor's success, subcontractors are often taken for granted. Jin et al (2013) suggested that Imbalance of power between head contractors and subcontractors can be eliminated by forming partnership based relationship that are based on mutual objectives and fair contracts.
Rajput and Agarwal (2015) advocated that the documentation between main contractors and subcontractors regarding designs, drawings, plans, schedules and management systems

should be clear and complete. They suggested that if the main contractor is not content with the performance of subcontractors they must issue warnings to the subcontractor before assigning part of the work to a new subcontractor. Moreover, the main contractor should inform the initial subcontractor well in advance. The parties should also consider their financial conditions and plan carefully in order not to face problems of financial crisis during a project. To the subcontractors, Rajput and Agarwal (2015) suggested that they should do their work with respect to terms and conditions, which are given in the contract document. Conforming to required standards and finishing work within the required time. To do so the subcontractor should possess high quality material and sufficient experienced labour.

MATERIALS AND METHODS

Extensive literature review was carried out to inform the development of research tools for primary data collection. The questionnaire survey was used as the principal method to gather information and gain insights into the research area. The selection of questionnaire for data collection method is because questionnaires allow the collection of large amounts of data from many respondents in a short period of time and in a relatively cost effective way. The questionnaires were distributed to contractors, subcontractors and clients who are directly involved in the execution of construction projects in Zambia.
A total of 80 questionnaires were distributed. The questionnaires were distributed by hand and also via email. Out of the targeted 80 respondents 56 responded, giving a response rate of 70 percent. Data collected were then analysed statistically using Microsoft Excel software. The Relative Importance Index was used to determine the ranking of factors causing interface problems and those that can improve the relationship. The Relative Importance Index (RII) was computed using the following formula: Equation (1) (Okunlola, 2015).

$$RII = \frac{\sum W}{AN} = \frac{5n_5+4n_4+3n_3+2n_2+1n_1}{5N} \quad (1)$$

Where:
RII = relative importance index
W = the weighting given to each factor by respondents.(ranges from 1 to 5)
n_1 = number of respondents for very important, n_3 = number of respondents for important, = number of respondents for neutral, n_4 = number of respondents for important = number of respondents for very important.
A = the highest weight (which is 5 in this case)
N = sample number

Finally, the findings were presented using graphs and charts to provide a clear view of the survey.

FINDINGS AND DISCUSSION

The survey focused on determining the nature of the relationship between main contractors and subcontractors in the Zambian construction industry. Figure 1 illustrates the results on how the respondents perceived this relationship.

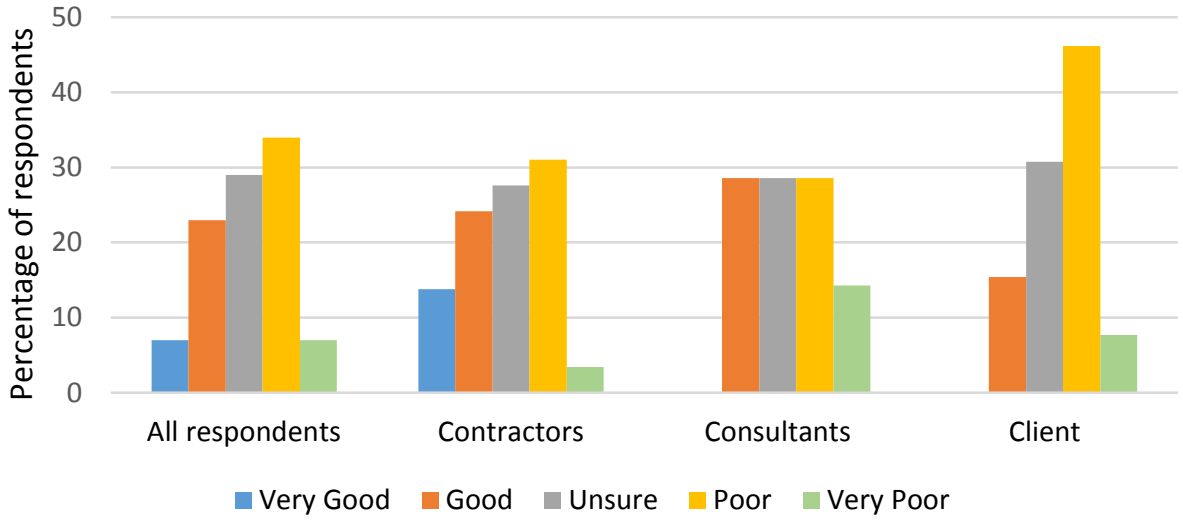
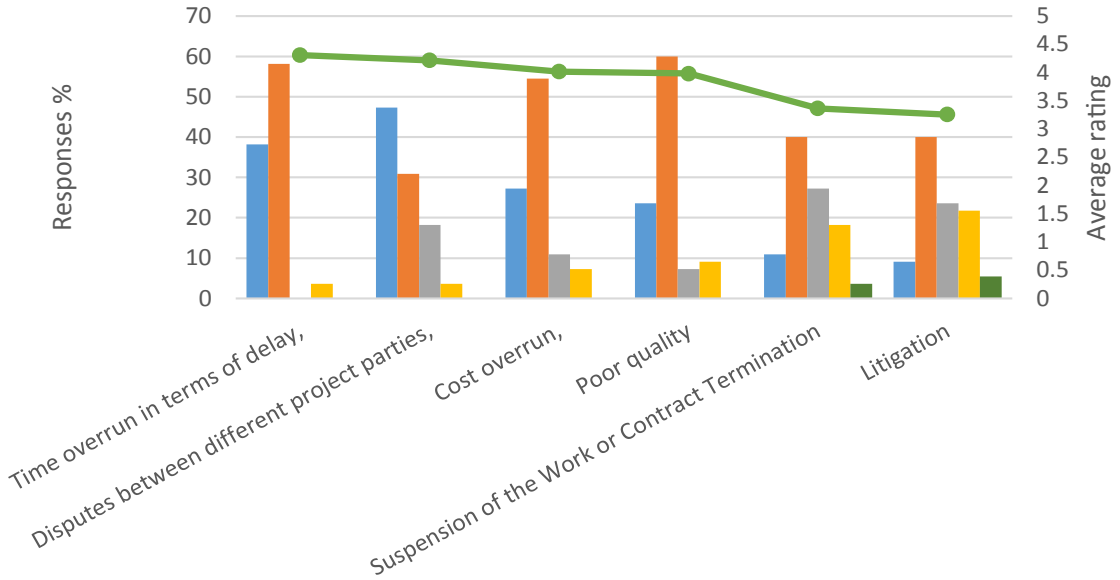


Figure 1: The relationships between main contractors and subcontractors

Among all the respondents, 29 percent indicated that they were not sure, 41 percent indicated the relationship was poor and 30 percent indicated that it was good. No opinion was shared by more than 50 percent of the respondents this could mean not much attention was being put on this relationship in projects to foster a strong opinion. This is further concreted by the fact that 29 of the respondents indicated that they were not sure. However, the opinion with a higher prevalence was that of a poor relationship between main contractors and subcontractor.

From the questionnaire results, effects of a poor relationship between main contractors and subcontractors on a project were rated on a Likert scale and analysed using their average rating. Figure 2 shows the impacts of a poor relationship between the main contractors and subcontractors. As indicated in Figure 2 indicates that project time overruns in terms of delay, are likely to occur if there are problems in the relationship. These results concur with results adduced by Okunlola, (2015) demonstrating that, projects

Figure 2: Impacts of a poor relationship between the main contractors and subcontractors



with interface problems are prone to project time overruns.

Interface Problem Caused by Main Contractors

In order to determine the factors causing interface problems in the Zambian construction industry, respondents were asked to show the importance of factors obtained from literature review. This was done by attaching a weight to the factors on a Likert scale according to their importance. The factors were then ranked using their Relative Importance Index (RII). Figure 3 shows the ranking of factors causing interface problems emanating from the main contractor.

As indicated in figure 3, Delay in progress payment with an RII of 0.924, on average was ranked by the respondents as the most important factor. Failure to receive payment in a timely manner exposes subcontractors to a risk of failing to complete construction projects on time (Ansah, 2011). Figure 3 shows that the factor ranked third is related to payment of the subcontractor, this highlights the significance of payment to the main contractor-subcontractor relationship. Results agree with Okunlola (2015) who observed that payment problems were one of the dominant factors leading to an adversarial relationship between main contractors and subcontractors. The consultants and contractors ranked delay in progress payment as their most important factor while clients saw the absence of contractor on site as the most significant factor. This could be because clients as the owner of the project are more apprehensive to ample project stipulated time and the absence of the contractor affects project in terms of quality and completion of a project (Enshassi et al, 2012).

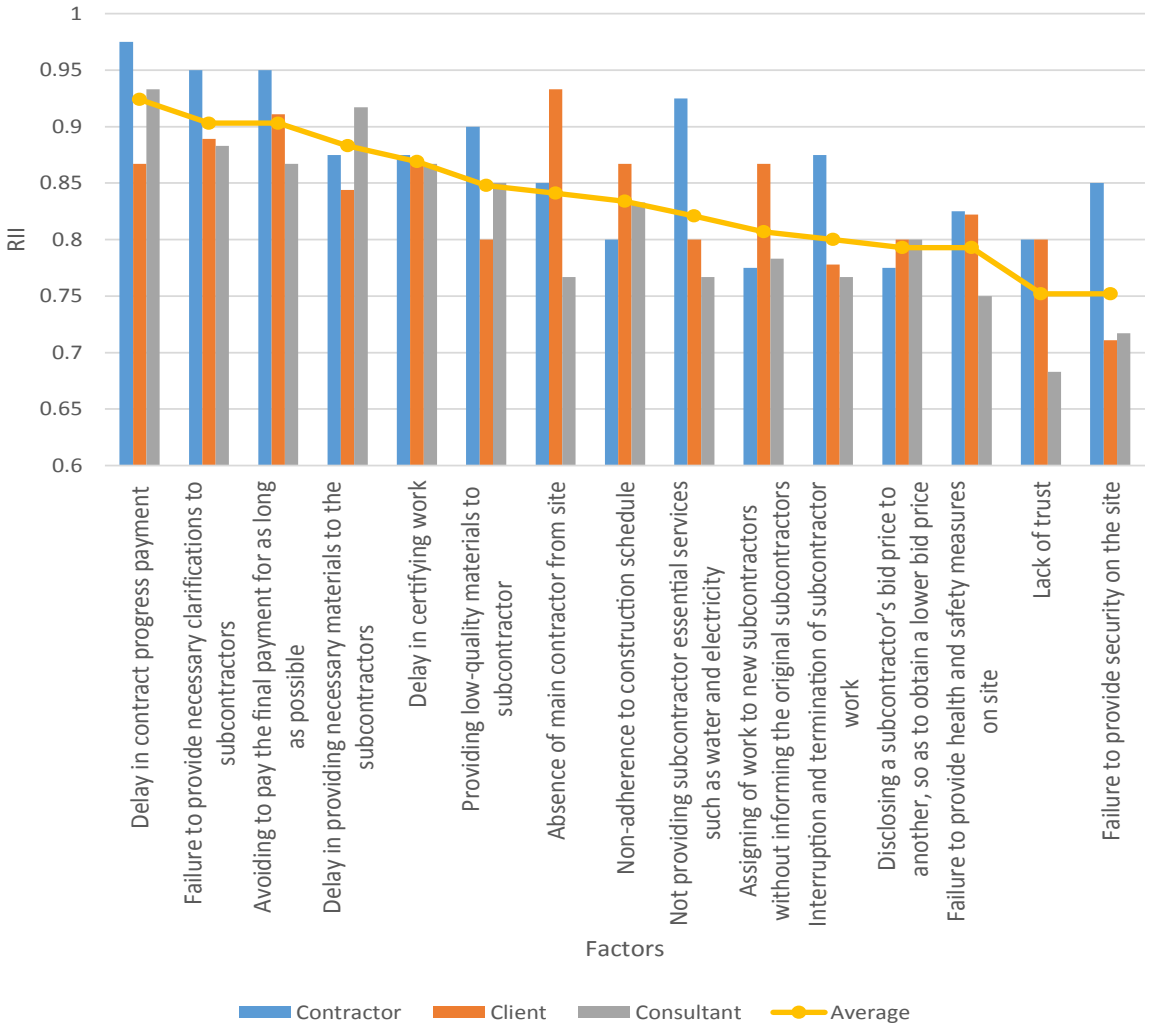


Figure 3: Factors causing interface problems between main contractors and subcontractors caused by main contractors

Interface Problem Caused by Subcontractors

Respondents were also asked to determine the importance of factors caused by subcontractors. Figure 4 shows factors causing interface problems by subcontractor.

Figure 4 illustrates that not following main contractor's instructions was ranked as the most important factor with an RII of 0.931. These results agree with Enshassi et al, (2012) who alluded that when the subcontractor does not work in accordance to the main contractor's instructions, tension and mistrust can develop between the two parties. Other factors ranked among the dominant factors include lack of proper equipment and work delays. Subcontractors are typically small firms and adversely may lack adequate equipment consecutively delivering below par work execution and compromising the quality of project. This relates to the fact that lack of construction quality is ranked among the top 5 factors. The high ranking of work delay is because delays may accompany penalties and this can result in contention between main contractors and subtractors (Yoke-Lian et al, 2013). The results show that the factors caused by the subcontractors are concerned with ability of the subcontractor to deliver according to the contractor's requirement.

Interface Problem Caused by External Factors

Figure 5 shows the opinion of the respondents regarding factors leading to interface problems caused by the external factors.

As indicated in figure 5, price escalation of material and labour with an RII of 0.952 was the highest ranked factor. This shows that this factor is the most important external factor causing interface problems between main contractors and subcontractors. The significance of this factor is due to the fact that the construction sector is prone to fluctuations of material prices. Such price changes can make the estimation of work

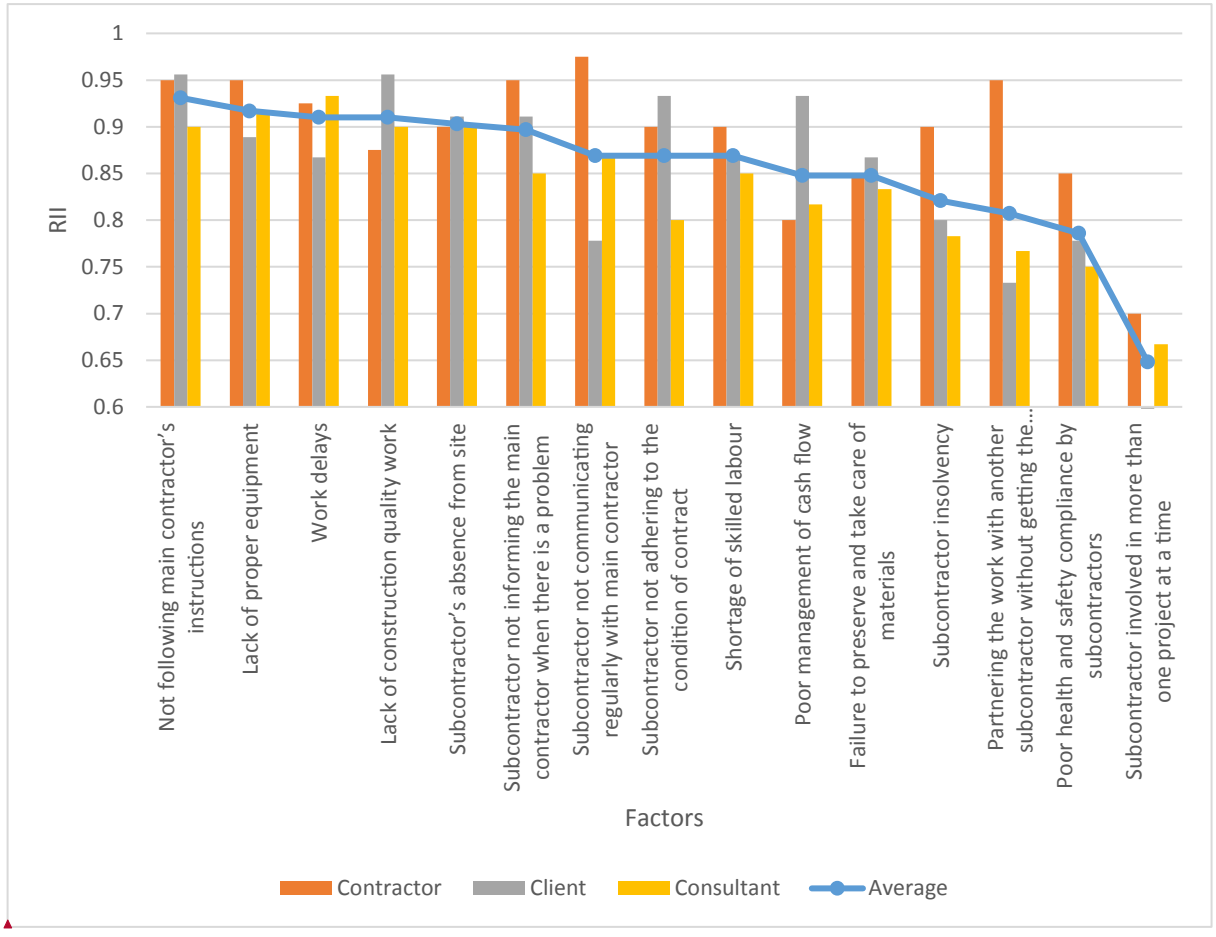


Figure 4: Factors causing interface problems between main contractors and subcontractors caused by subcontractors

difficult and this can affect the profitability of work and lead to subcontractors cutting corners to ensure work is completed within budget. Poor work quality and disregard of health and safety measures will rise from this and lead to tension

be regular, through regular meetings in order to build a better interface. Rajput and Agarwal (2015) advocated that in order to improve the relationship between main contractors and subcontractor, the documentation between main

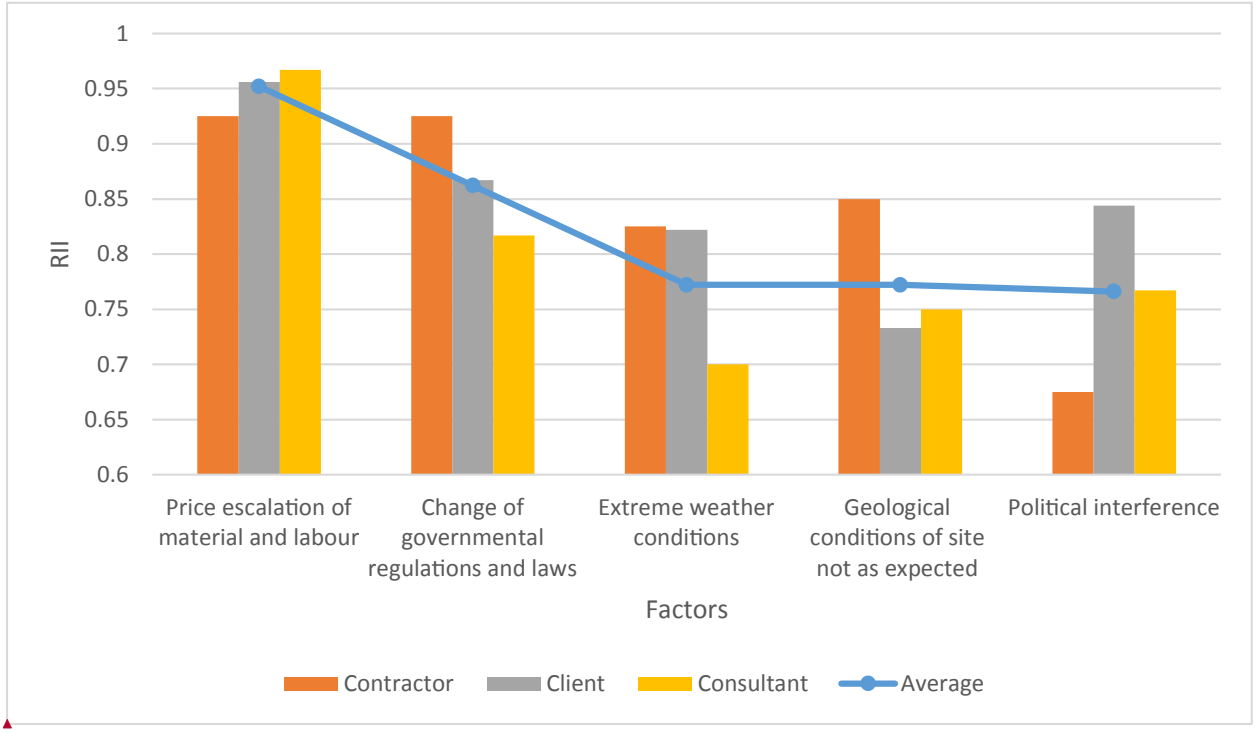


Figure 5: Factors caused by external influences

between main contractors and subcontractors. This results echo Rajput and Agarwal, (2015) who noted that financial difficulties on subcontractors imposed by issues like price escalations and contractor's financial problems can make them unable to pay workers and suppliers, which lead to time and cost overrun for the project and this will in turn cause issues or interface problems between main contractor and subcontractor.

Improving the Interface Between Main Contractors and Subcontractor

Respondents were requested to rate attributes that can enhance the relationship between the main contractors and subcontractors. Figure 6 shows the ranking of the factors.

Communicating regularly and complete and clear documents were ranked as the 2 top factors both with RII of 0.966. This deduction resonates with White and Marasini, (2014) who found that project teams considered it important that the communication between project parties should

contractors and subcontractors regarding designs, drawings, plans, schedules and management systems should be clear and complete. Clear well stated document can help with the avoidance of disputes early in the project cycle. The fact that among the top 5 factors, 4 are communication related shows that proper communication between main contractors and subcontractors is crucial on a project. Enshssi, (2012) reinforces this by stating that communication is essential to ensuring an effective relationship between main contractors and subcontractor.

CONCLUSION AND RECOMMENDATION

Subcontracting has become a major part of construction projects. As a result, the relationship between main contractors and subcontractors plays a vital role in project success. Strain in this relationship has been a source of disputes and projects not attaining their goals, hence the study was conducted to understand and help improve this relationship. The study found that

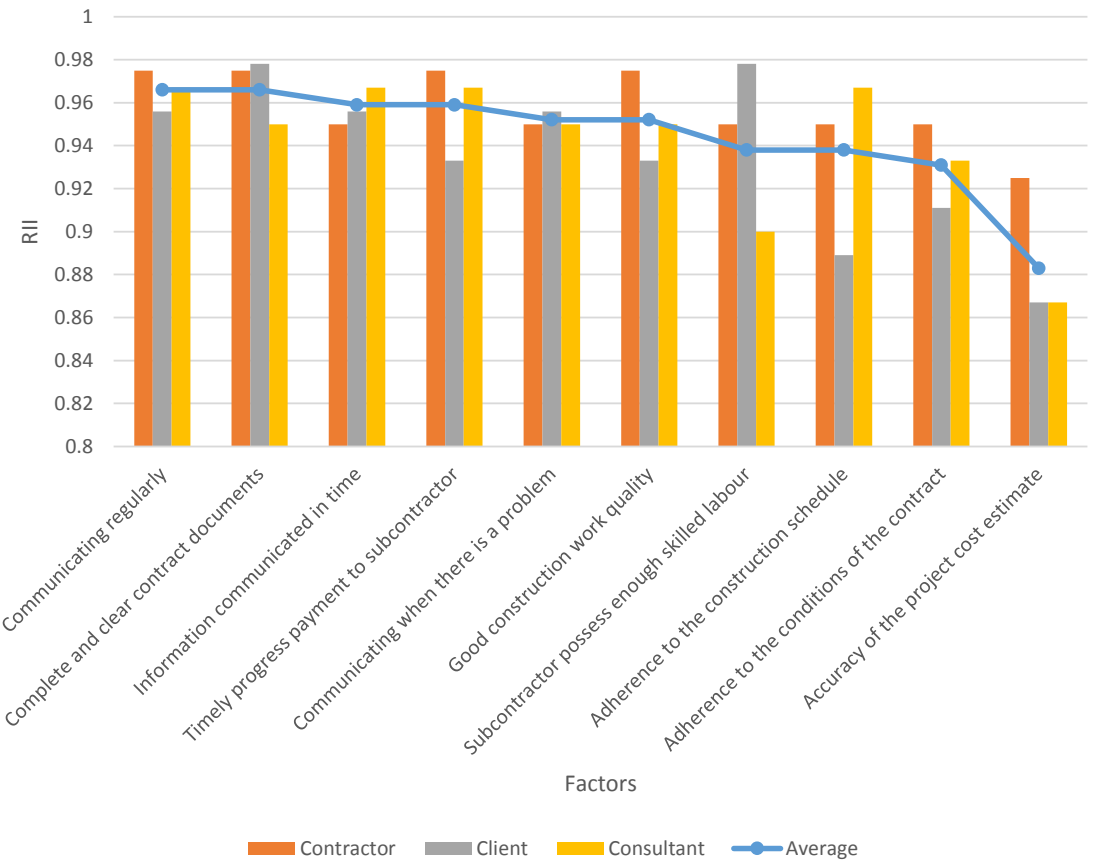


Figure 6: Top ten attributes that can enhance the relationship between the main contractors and subcontractors

the relationship between main contractors and subcontractors in the Zambian construction industry on many projects in not satisfactory and requires attention as it was causing project delays.

Factors that were most affecting the relationship between main contractors and subcontractors were identified and grouped according to the party responsible for the factor. The study revealed that the most important causes of contention instigated by the contractor were delay in contract progress payment followed by failure to provide necessary clarifications to subcontractors and the third being avoiding to pay the final payment for as long as possible. These top factors indicate that issues to do with payment contribute significantly to problems between subcontractors and main contractors. On the other hand, results revealed that the top causes of interface problems emanating from the subcontractor were; not following main contractor's instructions, lack of proper equipment and work delays. This indicates that the factors emanating from the subcontractor are concerned with the ability of the subcontractor to deliver according to the contractor's requirements. The top 3 external causes of contention were; Price escalation of material and labour, Change of governmental regulations and laws and Extreme weather conditions.

The study also identified solutions to the relationship between main contractors and subcontractors. The 5 most important attributes brought from the study were: communicating regularly, complete and clear contract documents, information communicated in time, timely progress payment to subcontractor and communicating when there is a problem. Communication can solve some of the top dispute instigating malefactors found in this research. The results showed that subcontractors not following instructions was a major issue, however with effective communication this cause of problem between main contractors and

subcontractors can be solved. In addition, the results showed that failure to provide necessary clarifications to the subcontractor was a major factor and this factor can also be solved through effective communication. According to the results, effective communication translates to communicating regularly, providing complete and clear contract documents, communicating in time and communicating when there is a problem. In conclusion, in order to improve the relationship between main contractor and subcontractor, main contractors are recommended to provide payment to the subcontractor according to their agreement. The subcontractor is recommended to perform their work in accordance with the main contractors stipulated requirements. In addition, both the main contractors and subcontractors are recommended to take careful considering of their financial situation and make comprehensive cost estimates before embarking on a project in order to tackle external factors such as price escalation of material and extreme weather conditions. Both parties should ensure communication should be regular and comprehensive to ensure successful project delivery.

REFERENCES

1. Abdullahi A.H. (2014) Review of subcontracting practice in the construction industry. Journal of Environmental Sciences and Resources Management, Vol. 6(1), pp. 23-33.
2. Akintan A and Morledge R (2013) Improving the Collaboration between Main Contractors and Subcontractors within Traditional Construction Procurement. Journal of Construction Engineering, Vol. 2013, pp. 11.
3. Andy NG K W and Andrew Price D F (2010) Causes leading to poor site coordination in building projects Organization, Technology and Management in Construction: An International Journal, Vol. 2 (2), pp. 167-172.
4. Ansah S K (2011) Causes And Effects Of Delayed Payments By Clients On Construction Projects In Ghana. Journal of Construction Project Management and Innovation, Vol. 1 (1), pp. 27 – 45.
5. Central Statistical Office (2016) The Monthly, Vol. 167: Central Statistical Office Lusaka, Zambia.
6. Construction Industry Development Board, South Africa (2013) Subcontracting in The South African Construction Industry; Opportunities for Development: CIDB, Pretoria, RSA.
7. Enshassi A et al (2012) Major causes of problems between contractors and subcontractors in the Gaza Strip. Journal of Financial Management of Property and Construction, Vol. 17 (1) pp. 92 - 112.
8. Eriksson P E and Westerberg M (2011) Effects of cooperative procurement procedures on construction project performance: A conceptual framework. International Journal of Project Management, Vol. 29(2), 197-208.
9. Jin X P et al (2013) Relationship between Head Contractors and Subcontractors in the Construction Industry: A Critical Review, Seventh International Conference on Construction in the 21st Century (CITC-VII), December 19-21, 2013, Bangkok, Thailand.
10. Kaliba C (2010) Cost Escalation, Schedule Overruns and Quality Shortfalls On Construction Projects. A dissertation submitted to the University of Zambia in fulfilment of the requirements for the Degree of Master of Engineering in Construction Management: University of Zambia.
11. Manu P et al (2013) Mitigating the health and safety influence of subcontracting in construction: the approach of main contractors. International Journal of Project Management, Vol. 31(7), 1017–1026.
12. Meng X (2012) The effect of relationship management on project performance in construction. International Journal of Project Management, Vol. 30 (2012), pp 188–198.
13. Mignot A (2011) Alliancing benefits and challenges in infrastructure projects. Project Manager, 31 March 2011. http://projectmanager.com.au/managing/cost/alliancing-benefits-and-challenges-in-infrastructure-projects/3/ , (Accessed on 24 March 2015).
14. Mirawati N A et al (2015) Supplier-Contractor Partnering Impact on Construction Performance: A Study on Malaysian Construction Industry, Journal of Economics, Business and Management, Vol. 3(1), pp. 29-33.

15. Mortaheb M M et al (2010) Interface Management in Mega Oil Refinery Projects. 6th International Project Management Conference. Tehran, Iran, 26–27 October 2010. pp. 1–19.
16. Okunlola O S (2015) The Effect of Contractor-Subcontractor Relationship on Construction Duration in Nigeria. International Journal of Civil Engineering and Construction Science, Vol. 2(3): pp. 16-23.
17. Phiri F (2016) An Analysis of the Twenty Percent Subcontracting Policy in the Zambian Construction Sector: Its Efficacy in Developing Capacities of Local Contractors. Masters dissertation, Lusaka: University of Zambia.
18. Rajput B L and A L Agarwal (2015) Study of Pros and Cons of Subcontracting System Adopted in Executing Indian Construction Projects. International Journal of Modern Trends in Engineering, No.:2349-9745, Date: 2-4 July, 2015.
19. Rhodes C (2015) Construction industry: statistics and policy, Briefing Paper Number 01432, 6 August 2015.
20. Saasa O and Musonda C (2018) Pro-Growth Road Infrastructure Development in Zambia: Challenges, Opportunities and Policy Options. Report. Lusaka: Premier Consult Ltd Economic Social & Business Consultants.
21. Ujene A O et al (2011) The Nature and Effects of Subcontracting On the Performance of Building Projects in South-South Zone of Nigeria, Journal of Architecture, Planning & Construction Management, Vol. 1(2).
22. Vilasini et al (2012) A framework for subcontractor integration in alliance contracts. International Journal of Construction Supply Chain Management, Vol. 2(1), pp. 17-33.
23. White H and Marasini R (2014) Management of Interface between Main Contractor and Subcontractors for Successful Project Outcomes, Journal of Engineering, Project, and Production Management, 2014, Vol. 4(1), pp. 36-50.
24. Yoke-Lian L et al (2012) Review of Subcontracting Practice in Construction Industry IACSIT. International Journal of Engineering and Technology, Vol. 4(4), pp 442-445.