

Improving the Contractor-subcontractor Relationship Through Partnering on Construction Projects in Zambia

Tafadzwa Mudzvokorwa¹, Balimu Mwiya² and Erastus M. Mwanaumo³

¹Post Graduate Student, Department of Civil & Environmental Engineering, University of Zambia, Lusaka, Zambia, 10101, E-mail:tafmud@gmail.com (***corresponding author**)

²Head of Department, Department of Civil & Environmental Engineering, University of Zambia, Lusaka, Zambia, 10101, E-mail:balimu.mwiya@unza.zm

³Lecturer, Department of Civil & Environmental Engineering, University of Zambia, Lusaka, Zambia, 10101, E-mail:erastus.mwanaumo@unza.zm

ABSTRACT

Received: Mar 14, 2019

Revised: Sep 24, 2019

Accepted: Dec 09, 2019

With 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. Consequently, improving this relationship increases the probability of project success and enhancing project performance. A wide range of research has confirmed that partnering improves the main contractor-subcontractor relationship. Though the positive impact of partnering on project performance is supported by a plethora of evidence, the guiding theory on practical partnering process steps is limited. The study aimed at improving subcontracting in the construction industry through a partnering process relevant to Zambia guided by factors obtained from industry experts. Questionnaire surveys and Semi-structured interview were adopted to investigate the perception of construction industry professionals and academics towards the main contractor-subcontractor relationship along with improvement factors. The findings showed that the relationship between main contractors and subcontractors on most projects in Zambia is unsatisfactory therefore justifying attention. Top factors that can enhance the main contractor-subcontractor relationship were identified. From the factors deduced and guidelines on partnering best practices, a project partnering model was developed.

Keywords: Construction Project, Main contractor, Subcontractor, Partnering, Zambia

INTRODUCTION

The construction industry contributes significantly towards the economic output of a country [28]. The United Kingdom (UK) construction industry contributed £103 billion in economic output which is 6.5 percent of the total output in 2014. It also created 2.1 million jobs which was 6.3 percent of the UK total employment [33]. In Zambia, the construction industry comprised 9.9 percent of the national Gross Domestic Product (GDP), with a growth rate of 8.9 percent from 2013 [6]. A major aspect of projects in the construction industry is subcontracting [36]. Research has shown that currently up to 90 percent of the work on a construction project is performed by subcontractors [32]. Assigning work to a subcontractor reduces workload and limits the contractors risk exposure [1]. Manu et al. [26] indicated that subcontracting is a means of bargaining down labour cost, encourage quicker



completion of tasks, externalise less rewarding and dangerous activities and rapidly meet changing product market demands.

However, with all its benefits, subcontracting can be a risk to construction projects [42]. Kaliba [23] identified that subcontracting was causing project schedule overruns in Zambia. A major aspect that contributes to the degree of success or failure of subcontracted projects is the relationship between main contractors and subcontractors [21, 31, 38, 25]. Often interface problems can emanate, which include the lack of cooperation, limited trust, and ineffective communication, leading to inefficiencies and an adversarial relationship between the main contractor and subcontractor and [28, 8]. However, a better interface between project parties encourages project success or even improve project performance [37]. Eom et al. [16] added that maintaining long-term relationships with subcontractors is absolutely necessary to improving the overall efficiency in the supply chain.

Partnering is recognised as a means to foster the collaborative relationship between parties and improve project performance [27, 20, 12]. Partnering is a voluntary process by which two or more organizations act as a team to achieve mutually beneficial goals [28]. However, one of the major impediments to successful partnering is the considerable uncertainty as to how to translate general principles of partnering into any sort of concrete application [35]. A large number of practical partnering guiding theory on partnering is limited and elusive [3]. It is in this area that this paper hopes to make a useful contribution to the body of knowledge in construction engineering by finding relationship enhancement factors and generating a partnering flowchart relevant to Zambia.

LITERATURE REVIEW

The plethora of evidence supporting the paybacks of a healthy relationship between main contractors and subcontractors in construction projects has instigated worldwide research focused on fostering a fruitful relationship between the parties [7]. A number of factors have been found to enhance the contractor-subcontractor relationship. Enshassi et al. [14] emphasised that a balanced flow of information between main contractors and subcontractors is crucial. Akintan and Morledge [2] encouraged a communication system that ensures prompt and sustained sharing of information between the main contractor and subcontractor. Rajput and Agarwal [32] further advocated for the sharing of clear and complete documentation between main contractors and subcontractors. Similarly, early communication when there is a deterrent to project delivery is essential [26].

Rajput and Agarwal [32] presented diverse factors that improve main contractor subcontractor relationship. Factors include; project parties respecting terms and conditions given in the contract document. Conforming to required standards and finishing work within the required time. If the main contractor is not content with the performance of subcontractors they must issue warnings in advance to the subcontractor before assigning part of the work to a new subcontractor. Moreover, the contractors should also consider their financial conditions and plan carefully in order to not face problems of financial crisis during a project.

Building trust amongst project participants is associated with superior team coordination [7]. Trust exude from factors such as: collective pull-based planning, measurement, learning, and continual improvement [2]. Trust

between project parties encourages transparency and commitment [2]. Jin et al. [21] advised that project participants need to eradicate stereotypes, ideologies and do away with their professional delineations to be able to trust one another.

Fah [17] recognised that in order to solve interface problems and minimise its negative effects on a project, a proper plan should be devised. Jin et al. [21] noticed that forming partnership based relationship that are based on mutual objectives and fair contracts can help improve project delivery. Larson [24] advocated integration of subcontractors in major project decisions.

Enshassi et al. [14] recommended that main contractors should issue the financial payments to the subcontractor on time, as it enables the subcontractor to cover expenses, purchase the required materials, and pay for the labours on time. Whereas for the subcontractor, Enshassi et al. [14] suggested the use of all safety measures, the utilisation of modern techniques for management of labours and materials, the proposing of suitable and reasonable prices and lastly the employing of a sufficient number of qualified technical staff.

Efficient and effective site coordination requires main contractors to focus their efforts in the management systems, especially communications [25]. The main contractor's success on projects relies on the temporary bounded interdependent services of the subcontractor hence quality work by subcontractor is essential to the main contractor [38].

Studies have indicated that partnering has a positive impact on relationship and project performance, in context of time, cost and quality, safety and reducing lengthy litigations [28, 30, 13, 12, 19]. This is because partnering is a management technique designed to overcome the usual tendency of managing projects in the traditional adversarial manner [24]. There is considerable variation of definition of partnering however, there is conformity over the general concept of partnering as a co-operative relationship between business partners formed in order to improve performance in the delivery of projects [34]. It is regarded as a management tool to improve quality and programme, to reduce confrontations between parties, thus enabling an open and non-adversarial contracting environment [8]. Nevertheless, little research outlines the mechanism behind its application [35].

Partnering can be categorised as non-contractual or contractual partnering this is based on contractual status [20]. Non-contractual partnering is not legally binding meaning it does not change the terms of contract or the contractual relationships that exist between the parties. The contract is deemed, as an insurance policy should the parties retreat from their roles and responsibilities under the partnering agreement [34]. Contractual partnering is where partnering principles are incorporated into the construction contract. This is done by either amending the existing traditional contract to make it more partnering friendly or adopting a full standard partnering contract [20]. The use of non-contractual partnering would be more appropriate on small construction projects [12].

A crucial aspect of the partnering process is the partnering charter. This document is intended to be nonbinding statements reflecting the participants' mission, goals, and guidelines [12]. The document provides testament to mutual recognition of interdependence by the parties. It is a testament to the social contract that binds the parties to develop, and commit to, a common purpose and approach for achieving the project goals [3].

Another pivotal aspect of partnering is the facilitator. The facilitator is an independent professional trained to assist in developing an effective partnering process and partnering workshops for the project [20]. The facilitator should be experienced in partnering and understand the various aspects of partnering, including its potential benefits, requirements and process of partnering. If the project is small and not complex the project can be internally facilitated or a third party volunteer from local university or professional society can be used [12].

There are basic activities and processes highlighted by literature to form the partnering endeavour. However, partnering endeavours depend upon customising activities to meet the specific needs and opportunities of the participants and the specific project [24]. Bodies in the construction industry such as The Hong Kong Construction Industry Council [20], Construction Excellence UK [11], Ohio Department of Transportation [30], Nevada Department of Transportation [28] and Florida Department Of Transportation [18] have published partnering manuals or frameworks to promote good practices in the construction industry.

Construction Excellence UK [11] advocated the importance of self-assessment in the partnering process as it enables an organisation to understand its own readiness for the partnering journey. Self-assessment provides information for an organisation to determine if staff requires training before embarking on a partnering journey. Therefore, self-assessment reduces the possibility of litigation and reverting to the contract during the project [9].

California Department of Transportation Division of Construction [5] recommended a facilitated dispute resolution session in a partnering process. The facilitated dispute resolution is held in lieu of a follow-up partnering session if a conflict or dispute arises and cannot be resolved in the follow-up meetings. In the spirit of collaborating, the session provides a further step towards dispute resolution before resorting back to the contract [7].

California Department of Transportation Division of Construction [5] included making the offer to partner as a crucial step to the partnering process. This step is important, as it does not involve just the making of the offer to partner but also the partner selection. Selection of a partner needs to be conducted carefully through a structured selection process [11]. The degree of success for the partnering relationship depends largely on the extent which the owner has incorporated its objectives into the partner selection process [9].

The decision to adopt partnering is recommended as an essential partnering step by the [20]. The decision must be backed by commitment from the highest level of the organisation management and is continually communicated and reinforced throughout the organisation. The organisation must be willing and prepared to adopt a culture change from the usual way of conducting work to a more collaborative approach [3].

Before making a committed decision to adopt partnering an organisation need to assess themselves [11]. The assessment involves understanding: if the organisation is sufficiently flexible and prepared to respond to a cultural change; if the decision to partner was backed by a satisfactory reason that will not become irrelevant as the project progresses; and if people in the organisation are knowledgeable about partnering. Self-assessment enables an organisation to understand their own readiness for the partnering journey [11].

An internal partnering training session allows staff of an organisation to fully understand what they will be involved in and how to make it successful [20]. An internal training session can be conducted as per organisational

requirements. The internal staff should understand the potential benefits of partnering to the project and the organisation and how to practice partnering [30]. Key project staff including engineers, architects and surveyors should be present.

The kick-off workshop is an important step in creating the partnering relationship as it is the first formal step towards partnering. This is where a party officially signals their intention to adopt a partnering approach [8]. The workshop is a platform where parties can know each other, identify project challenges, and create ways to overcome them. The workshop enables the partnering parties to set expectations, roles, and develop team processes that support the oncoming project. The team processes to be established include: mitigation strategies for project challenges, communication protocols, procedure for decision making and issue resolution, and establish the partnering plan for the project [41].

Follow-up partnering workshops are held at various intervals throughout the project life cycle. Follow-up partnering workshops are typically brief meetings. These workshops allow the partnering teams to monitor their partnering efforts and also integrate new members [20]. The frequency of these workshops depends on the size and complexity of the project. However, if the parties involved in the project develop a regular communication approach, they are more likely to discuss concerns before the situation reaches the stage requiring expensive rework or correspondence culminating into a dispute [12].

Facilitated Dispute Resolution Session is conducted with the sole purpose of team repairing when there is a dispute between the partnering parties. Facilitated Dispute Resolution Sessions are effective on all sizes of construction projects focus attention of all the parties on problem resolution, without prolonged disputes or litigation [24]. A facilitated dispute resolution session is scheduled with all the parties and a neutral facilitator present [28].

The closeout workshop is the final workshop held at the end of the project. It is not a requirement for a professional facilitator to be present for this meeting. The closeout workshop is primarily structured as a means of reflecting and learning [5]. Therefore, this workshop should create a “lessons learned” and means on how to implement those lessons in future projects. The closeout workshop shop is also conducted to celebrate project successes and completion of the project.

Partnering is not a onetime event however it's a cycle that continues throughout the project [28]. Procedures should be formulated to continuously assess the performance of the partnership. This can be done using relevant internal or external indicators. In addition, not all stakeholders will participate in the initial workshop for example subcontractors that are contracted after the project commences. Continuous improvement can allow such stakeholders to be identified and progressively integrated into the partnering process as the project progresses this can be done during the review workshop [20].

Tang et al. [35] proposed a partnering model based on critical success factors (CSF) in partnering obtained from a number of studies. The model has 18 basic components where 1-11 are partnering CSFs from literature and Components 11 – 18 of the model demonstrate the outcomes of the interactions of these CSFs. The main CSFs

identified include mutual objectives, commitment, equity, trust, attitude, openness, effective communication, teambuilding, problem resolution, timely responsiveness, and incentives. The outcomes include improved construction efficiency of the whole project, improved risk management, lower monitoring costs, increased innovation and value engineering, and improved total quality management.

The first step of partnering according to the model by Tang et al. [35] is developing a partnering charter addressing mutual objectives. This sharing of goals will change attitude of participants and enable them to consider the interests of others by utilizing win/win thinking. This will give participants confidence to accept commitment and equity at the beginning as they recognize that benefits can also be reached. The factors of mutual objectives, active attitude, commitment, and equity are the precursors necessary for establishing trust between participants.

Tang et al. [35] went on to state that the factors of mutual objectives, active attitude, commitment, and equity are the precursors necessary for establishing trust between participants. Besides informal oral communication, partnering typically devises procedures for two other kinds of communication: meetings and written communication. These communication methods can be more specifically termed openness, team building, effective communication, problem resolution, and timely responsiveness

Influenced by the fact that partnering literature has primarily focused on the benefits of partnering, Crane et al. [9] developed a partnering process model that outlines the steps that a company interested in pursuing partnering should take to realise the benefit of partnering. The partnering process model consists of five steps that an organization wishing to create a successful partnering relationship must follow.

The first stage is owner's internal alignment, this provides a framework for defining the needs of the organization. It helps in evaluating partnering as an option to fulfil needs, and allocating responsibilities to be performed by the two primary organisations in the partnership. Second stage is partner selection. The criteria for selecting a partner will reflect the owner's business objectives, and the partner selected will possess the qualities needed to satisfactorily accomplish business objectives [9].

The third step is the partnering relationship alignment The partnering relationship alignment phase is designed to help partners in a strategic alliance understand each other's long-term goals and objectives. The forth step is The project alignment phase which presents activities that support the success of partnering on specific projects by building on the concepts developed in phase three. Qualities of strategic alliance alignment are to be equally desired in a project-specific relationship if the partners are to enjoy the full benefits of partnering. The final stage is the work process alignment, here the goals of the partnership are translated into action. The objectives of this phase are to establish intra-project goals consistent with project objectives and to establish work processes to achieve discipline and work process goals [9].

Larson [24] provided a partnering model with basic blocks contained in the pre-project stage and project implementation stage. In the pre-project stage, activities consist of partner selection and team building. Implementation stage involve joint evaluation, escalation, continuous improvement and persistent leadership. The vital approach behind partnering is building a foundation for collaboration before disputes and problems arise. A

team building session is then conducted with the principals from the different firms getting together and establishing the goals and guidelines for initiating the partnering endeavour [24].

After conducting team-building sessions, the collaborative spirit spawned through the sessions is sustained during the project through a number of mechanisms. All parties should regularly engage in joint evaluation of the project including an assessment of each others' adherence to the initial stipulated principles of collaboration. Issues escalation guidelines are implemented so that problems are solved in a timely, efficient manner at the lowest appropriate level or they are "escalated" to the next management level. Procedures for continuous improvement are implemented so that owners respond quickly to proposals and share the risk as well as the savings from such improvements. In all these processes top management must champion the partnering principles consistently and visibly and encourage openness, trust, and teamwork [24].

Conley and Gregory [12] indicated that the first step in developing a partnering agreement is to determine if the contractor is willing to participate in a partnering arrangement. The next step is to identify the members or stakeholders to participate in the scaled down partnering workshop. One of the major accomplishments of the partnering workshop would be the development and signing of the partnering charter. After the initial workshop a number of follow-up meetings will be conducted to aid the effort toward open communication and transparency [12].

Cheung et al. [8] provided a partnering process obtained from Mass Transit Railway Corporation (MTRC) in Hong Kong. The process began with a joint workshop involving key project participants on the contract to understand objectives and develop project charter. Monthly review meetings are arranged to monitor the partnering status of the project. Social functions with shared responsibilities would be incorporated in the partnering process. Additional tools including, partnering newsletter, partnering scores questionnaire, key performance indicators and contract reports would be used to reinforce and maintain the partnering spirit [8].

RESEARCH METHODOLOGY

The objective of the literature review was to develop a framework for the research study and prepare for the structured interviews and questionnaire survey. In addition, Literature review provided the basis of model development. Questionnaire survey was conducted in conjunction with interviews to allow for data triangulation. 12 face-to-face interviews with industrial practitioners who are directly involved in the execution of construction projects in Zambia, were conducted. The purpose of the interviews were to provide additional factors that could have not been obtained through literature reviews and also bring out factors specific to Zambia.

A total of 80 questionnaires were distributed. The data from questionnaires would assist in developing a model suitable for the Zambian construction industry. 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).

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

Where:

RII = relative importance index

W = the weighting given to each factor by respondents. (ranges from one to five)

n_1 = number of respondents for very important, n_2 = number of respondents for important, n_3 = number of respondents for neutral, n_4 = number of respondents for important = number of respondents for very important.

A = the highest weight (which is five in this case)

N = sample number

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

FINDINGS

The survey focused on determining the nature of the relationship between main contractors and subcontractors in the Zambian construction industry and how the relationship can be improved. Figure I illustrates the results on how the respondents perceived the relationship between main contractors and subcontractors in Zambia.

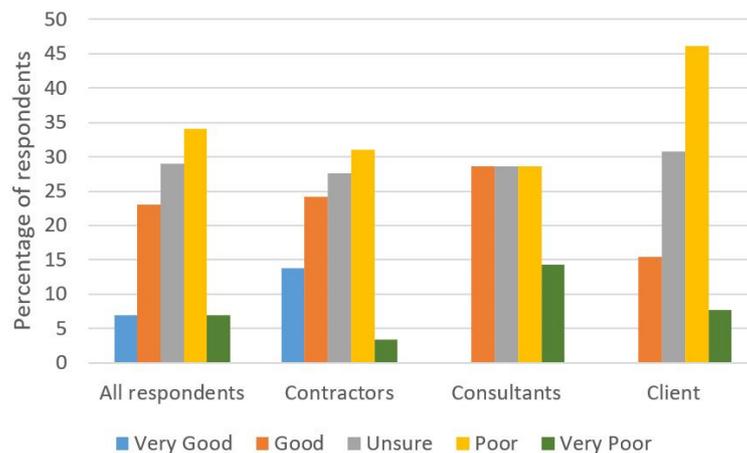


FIGURE I. THE RELATIONSHIPS BETWEEN MAIN CONTRACTORS AND SUBCONTRACTORS

Among all the respondents seven percent indicated that the relationship was very poor, 34 percent indicated that it was poor, 29 percent indicated that they were not sure, 23 percent indicated that the relationship was good and seven percent thought it was very good. This indicates that the overall sentiment among the total respondents is that the relationship between main contractors and subcontractors was unsatisfactory, therefore needing attention.

In order to find attributes that improve the main-contractor subcontractor relationship in Zambia respondents

were asked to rate 19 factors according to their importance. These attributes were obtained from literature review and others from interviews. Factors from literature review were: timely payments, subcontractor's early involvement in project, more meetings on site, clear requirements and scope of work, mutual trust, honesty between the parties, utilisation of modern techniques for management of labours and materials, proposing of suitable and reasonable costs, communicating when there is a problem, enough skilled labour, use of all safety measures, financial soundness before embarking on a project, adherence to the construction schedule and work with respect to terms and conditions of the contract document. Factors identified from interviews were: Clear contracts with requirements and responsibilities clearly stated, quality work, accuracy of the project cost estimate, communicating regularly and communicating in time. The factors were then analysed and ranked according to their RII from highest to lowest in order to adduce the most crucial factors that can help improve the main contractor-subcontractor relationship. Table I shows the top ten factors that can improve the relationship.

TABLE I. RANKING OF FACTORS THAT CAN ENHANCE THE RELATIONSHIP BETWEEN THE MAIN CONTRACTORS AND SUBCONTRACTORS

Factor	ALL		Contractor		Client		Consultant	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Communicating regularly	0.966	1	0.975	1	0.956	3	0.967	1
Complete and clear contract documents	0.966	1	0.975	1	0.978	1	0.950	5
Information communicated in time	0.959	3	0.950	5	0.956	3	0.967	1
Timely progress payment to subcontractor	0.959	3	0.975	1	0.933	6	0.967	1
Communicating when there is a problem	0.952	5	0.950	5	0.956	3	0.950	5
Good construction work quality	0.952	5	0.975	1	0.933	6	0.950	5
Subcontractor possess enough skilled labour	0.938	7	0.950	5	0.978	1	0.900	10
Adherence to the construction schedule	0.938	7	0.950	5	0.889	9	0.967	1
Adherence to the conditions of the contract	0.931	9	0.950	5	0.911	8	0.933	8
Accuracy of the project cost estimate	0.883	10	0.925	11	0.867	11	0.867	12

As indicated in Table I, four of the top five factors are related to communication. This shows that communication between main contractors and subcontractors is essential in their relationship. The 4 factors are: communicating regularly, complete and clear contract documents, information communicated in time and communicating when there is a problem. These results agree with Enshassi et al. [14] who stated that, strain in the relationships between

the main contractor and subcontractor can develop due to poor communication and lack of timely information on site. Rajput and Agarwal [32] specified that in order to improve the relationship between main contractors and subcontractor, the documentation between main 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. McCord and Gunderson [25] added that main contractors should consider recruiting and developing project managers that focus on good communication with the subcontractors, in order to develop a better relationship with the subcontractors and avoid disputes. Finally, the results agree with Manu et al. [26] who found that project teams considered it important that subcontractors are honest and open in communicating to all concerned parties, whenever there was an imminent problem related to their work package.

DEVELOPMENT OF THE MODEL

Partnering was determined as the suitable framework to enhance the main contractor-subcontractor relationship as it can foster most of the improvement factors identified in this study. In terms of communication, partnering fosters better communication by providing methods to discuss and share information freely regularly through meetings and daily updates [7]. Nevada Department of Transportation [28] highlighted that partnering provides better risk management that enables an improved ability to look forward, anticipate and avoid problems. Due to risk management and the collaborative working nature of partnering there are likely to be less financial difficulties on the project [27, 40]. In terms of work, poor project performance can be reduced by replacing the traditional approach with partnering arrangements [7, 27]. Therefore, a project that performs exceedingly conforms with the contract agreements. Furthermore, partnering encourages the early involvement of suppliers and contractors on a project and encourages trust among parties [15].

A partnering model applicable to Zambia would be proposed based on recommended models and integrating results from questionnaires and interviews. The steps in the flowchart will integrate the top factors obtained from literature to ensure relevance of model to the Zambian construction industry. The proposed partnering framework is meant to foster top improvement factors from obtained from this research. The factors are; Communicating regularly, Complete and clear contract documents, Information communicated in time, Timely progress payment to subcontractor, Communicating when there is a problem, Good construction work quality, Subcontractor possess enough skilled labour, Adherence to the construction schedule, Adherence to the conditions of the contract, Accuracy of the project cost estimate. The steps included in the model and their justification will be elaborated.

The first step of the partnering process is the decision to adopt partnering. This step is recommended by the Hong Kong CIC [20] based on evidence from a wide range of construction projects. A decision to adopt a partnering approach backed by commitment from the highest level of the organisation management and is continually communicated and reinforced throughout the organisation ensures the project and the partnering venture is successful [3].

The second step enforced by Construction Excellence UK [11] is self-assessment. This step is included in the model to foster the factor of clear contracts with requirements and responsibilities clearly stated. According to the Construction Excellence UK [11] self-assessment enables the contractor to wholly understand their position in terms of the project, their objectives and what they expect to achieve from the partnering endeavour. In order for the requirements and responsibilities to be clear the contractors expectations and intentions must be understood [24].

The third step is the appointment of the partnering facilitator. The role of the facilitator is that of a mediator between the two parties [20]. Thus, the presence of facilitator on a project creates an environment between the parties that enables regular and prompt communication when there is a problem [24].

For partnering to be successful the internal staff should understand the potential benefits of partnering to the project and the organisation and how to practice partnering [30]. Therefore to fully achieve the partnering benefits an organisation should consider training if they have not conducted partnering before [12].

All of the agreements and actions taken at the initial partnering session will be documented on the team charter. This document formalizes the team's vision and commitment to work together toward mutual success. The document will help the project in adhering to the construction schedule, as less time will be spent on disputes owing to the fact that objectives have been clear in the initial stages and mutually agreed upon [28]. The charter is included in the flow chart as it warrants accountability and clarity of agreements made and brings forth focus determination and quality work execution [8].

Initial Partnering Workshop is added to the proposed flowchart as the workshop helps in identifying project challenges and create ways to overcome them [41]. Risks like the delay in timely payments can be mitigated in time. Hong Kong CIC [20] identified the initial partnering workshop as a means of generating mechanisms of benefiting from opportunities that are presented during the course of the project. Meaning opportunities for delivering quality work, attracting adequate skilled labour, and completing work within schedule are exploited.

Follow-up partnering workshops allow the partnering teams to monitor the success of their partnering efforts and integrate new members [20]. These meeting provides an opportunity for regular communication and consequently issues are raised and resolved in time however, it is necessary to avoid the meeting becoming a dispute adjudication forum [8]. As a result, a facilitated dispute resolution session was added to the model. Facilitated Dispute Resolution Session is conducted with the sole purpose of team repairing when there is a dispute between the partnering parties. Timely resolution of disputes reduces delays thus the adherence to the construction schedule and work with respect to terms and conditions in the contract document [20].

The closeout workshop is added to reflect on successes and failures of the project. This ensures that performance is enhanced in terms of project time, quality and costs [5]. The final proposed partnering flowchart for improving the contractor-subcontractor relationship in Zambia based on recommendation and survey results is shown in Figure II.

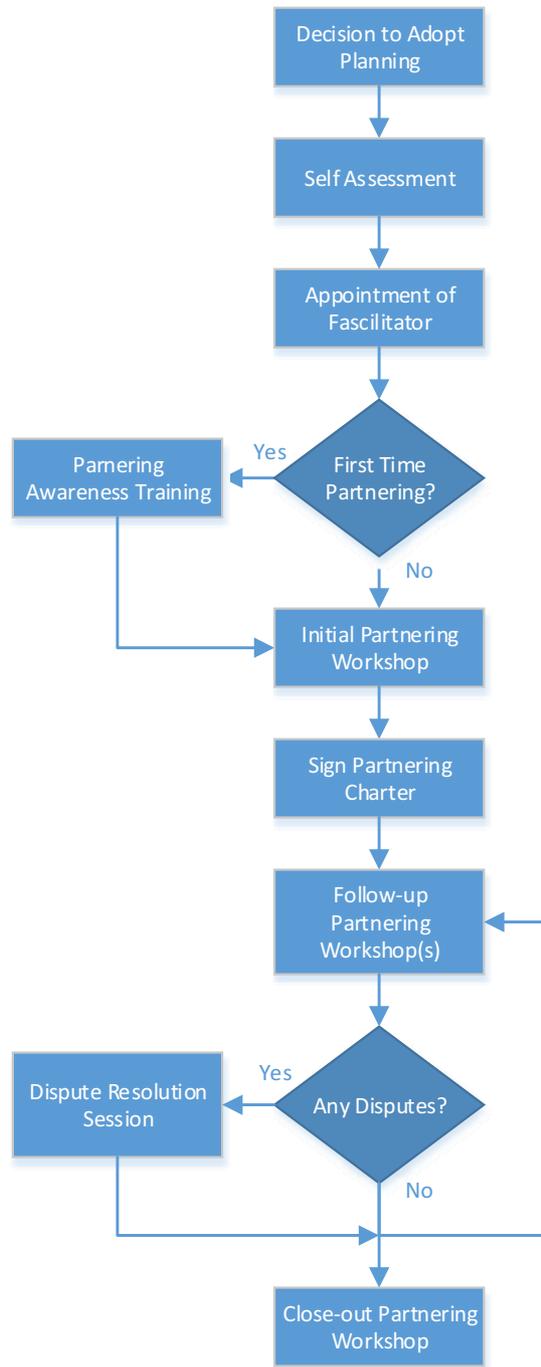


FIGURE II. NON-CONTRACTUAL PROJECT PARTNERING MODEL

CONCLUSION

Subcontracting has become a significant practice on construction projects in Zambia. Consequently, the relationship between main contractors and subcontractors is a major contributor to the success or shortcoming of a project. Strain in this relationship has been a source of prolonged disputes and projects not attaining their goals,

hence the study was conducted to understand and assist in the improvement of this relationship. The study found that the relationship between main contractors and subcontractors in the Zambian construction industry is substandard on many projects. A number of factors were suggested by key construction industry players to enrich the relationship. Literature review supported partnering as means of developing a collaborative approach on a project and enhance project performance.

Though the positive impact of partnering on project performance is supported by a plethora of evidence, the guiding theory on practical steps on partnering is limited. It is in this area that this research find relevance to the body of knowledge in construction. This research was produced to avail a practical partnering flowchart relevant to the Zambian construction industry. This was done by integrating partnering best practices guidelines with factors deemed to improve the subcontractor-main contractor relationship in Zambia. However, direct testing of the model will be required before it can be fully validated and deployed.

REFERENCES

- [1] Abdullahi, A.H., “Review of subcontracting practice in the construction industry”, *Journal of Environmental Sciences and Resources Management*, vol. 6, no. 1, pp. 23-33, 2014.
- [2] Akintan, A. and Morledge, R., “Improving the Collaboration between Main Contractors and Subcontractors within Traditional Construction Procurement”, *Journal of Construction Engineering*, p.11, 2013.
- [3] Anvuur, A.M. and Kumaraswamy, M.M., “Conceptual Model of Partnering and Alliancing”, *Journal of Construction Engineering and Management*, vol. 133, no. 3, March 1, 2007.
- [4] Chan, A.P.C. et al “Exploring Critical Success Factors for Partnering in Construction Projects”, *Journal of Construction Engineering and Management*, vol. 130, no. 2, April 1, 2004.
- [5] California Department of Transportation Division of Construction, “Field Guide to Partnering on Caltrans Construction Projects, California Department of Transportation Division of Construction, California, 2013.
- [6] Central Statistical Office (CSO), “The Monthly, vol. 167:” Central Statistical Office Lusaka, Zambia, 2016.
- [7] Cheng, E.W.L. and Li, H., “Development of a Practical Model of Partnering for Construction Projects” *Journal of Construction Engineering and Management*, vol. 130, no. 6, December 1, 2004.
- [8] Cheung, S., Ng, T.S.T., Wong, S., and Suen, H.C.H., “Behavioral aspects in construction partnering”, *International Journal of Project Management*, vol. 21, pp. 333-343, 2003.
- [9] Crane, T.G., Felder, J.P., Thompson, P.J., Thompson, M. G., and Sanders, S.R., “Partnering Process Model” *Journal of Management in Engineering*, vol. 13, no.3, May/June, 1997.
- [10] Construction Industry Development Board (CIDB), South Africa, “Subcontracting in The South African Construction Industry; Opportunities for Development”: CIDB, Pretoria, RSA, 2013.
- [11] Construction Excellence United Kingdom, (2004). [Online] “Partnering”, available from: <http://constructingexcellence.org.uk/wp-content/uploads/2015/03/partnering.pdf> [Accessed 23 June 2016]
- [12] Conley, M.A. and Gregory, R.A., “Partnering On Small Construction Projects”, *Journal of Construction Engineering and Management*, vol. 125, no. 5, September/October, 1999 P.E.
- [13] Du, L., Liu, C., Wang, S., Wang, T., Shen, W., Huang, M., and Zhou, Y., ‘Enhancing engineer-procure-construct project performance by partnering in international markets: Perspective from Chinese construction companies’, *International Journal of Project Management*, vol. 34, pp. 30-43, 2016.

- [14] Enshassi, A., Arain, F., and Tayeh, B., Major causes of problems between contractors and subcontractors in the Gaza Strip, *Journal of Financial Management of Property and Construction*, vol. 17, no. 1, pp. 92-112, 2012.
- [15] Eriksson, P.E., "Partnering in engineering projects: Four dimensions of supply chain integration." *Journal of Purchasing and Supply Management*, vol. 21, no. 1, pp. 38-50, 2015.
- [16] Eom, S.J., Kim, S.C., and Jang, W.S., "Paradigm shift in main contractor-subcontractor partnerships with an e-procurement framework." *KSCE Journal of Civil Engineering*, vol. 19, no. 7, pp. 1951-1961, 2015.
- [17] Fah, C., (2006) A study on domestic subcontractor, [online] Available from: <http://www.efka.utm.my/thesis/IMAGES/3PSM/2006/JSB/PART2/CHONGJUNFAHAA010080D06TTP.pdf> [Accessed on 4 May 2015]
- [18] Florida Department Of Transportation, "Partnering Facilitator's Manual" Office of Construction, September 1999.
- [19] Gadde, L.E. and Dubois, A., "Partnering in the construction industry: Problems and opportunities." *Journal of Purchasing and Supply Management*, vol. 16, pp. 254-263, 2010.
- [20] Hong Kong Construction Industry Council, "Guidelines on partnering", The Construction Industry Council, Hong Kong, 2012.
- [21] Jin, X.P., Zhang, G., Xia, B., and Feng, Y., "Relationship between Head Contractors and Subcontractors in the Construction Industry: A Critical Review", Proceedings of the Seventh International Conference on Construction in the 21st Century (CITC-VII), December pp. 19-21, 2013, Bangkok, Thailand, 2013.
- [22] Kadir, M.R., Lee, W.P., Jaafar, M.S., Sapuan, S.M., and Ali, A.A.A., "Factors affecting construction labour productivity for Malaysian residential projects", *Structural Survey*, vol. 23, pp. 42-54, 2005.
- [23] Kaliba, C., "Cost Escalation, Schedule Overruns and Quality Shortfalls On Construction Projects." Unpublished dissertation, University of Zambia, 2010.
- [24] Larson, E., "Partnering on Construction Projects: A Study of the Relationship Between Partnering Activities and Project Success", *IEEE Transactions On Engineering Management*, vol. 44, no. 2, May 1997.
- [25] McCord, P.J. and Gunderson, D.E., "Factors that Most Affect Relationships with General Contractors on Commercial Construction Projects: Pacific Northwest Subcontractor Perspectives", *International Journal of Construction Education and Research*, vol. 10, pp. 126-139, 2014.
- [26] Manu, P., Ankrah, N., Proverbs, D., and Suresh, S., "Mitigating the health and safety influence of subcontracting in construction: the approach of main contractors", *International Journal of Project Management*, vol. 31, no. 7, pp. 1017-1026, 2013.
- [27] Meng. X., "The effect of relationship management on project performance in construction", *International Journal of Project Management*, vol. 30, pp. 188-198, 2012.
- [28] Mirawati, N. A., Othman, S. N., and Risyawati, M.I., "Supplier-Contractor Partnering Impact on Construction Performance: A Study on Malaysian Construction Industry", *Journal of Economics, Business and Management*, vol. 3, no. 1, pp. 29-33, 2015.
- [29] Nevada Department of Transportation "Guide to partnering on NODT projects", Nevada Department of Transportation (NDOT), Nevada, 2010.
- [30] Ohio Department of Transportation "Partnering Facilitator Standards and Expectations Guide", Division of Construction Management, Ohio Department of Transportation, Ohio, 2013.
- [31] Okunlola, O.S., "The Effect of Contractor-Subcontractor Relationship on Construction Duration in Nigeria", *International Journal of Civil Engineering and Construction Science*, vol. 2, no. 3, pp. 16-23, 2015.
- [32] Rajput, B.L. and Agarwal, A.L., "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.
- [33] Rhodes, C., "Construction industry: statistics and policy", Briefing Paper Number 01432, 6 August 2015.

- [34] Skeggs, C., "Project partnering in the international construction industry". *International Construction Law Review*, vol. 20, no. 4, pp. 456-482, 2003.
- [35] Tang, W., Duffield, C.F., and Young, D.M., "Journal of Construction Engineering and Management", vol. 132, no. 3, March 1, 2006.
- [36] Ujene, A.O., Achuen, E., and Abakadang, O.E., "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, no. 2, 2011.
- [37] Vilasini, N., Neitzert, T.R., Rotimi, J.O.B., and Windapo, A.O., "A framework for subcontractor integration in alliance contracts", *International Journal of Construction Supply Chain Management*, vol. 2, no. 1, pp. 17-33, 2012.
- [38] White, H. and Marasini, R., "Management of Interface between Main Contractor and Subcontractors for Successful Project Outcomes", *Journal of Engineering, Project, and Production Management*, vol. 4, no. 1, pp. 36-50, 2014.
- [39] Widen, E. and Úlfarsson, A.K., "Effects of partnering on construction projects: The cultural, collaborative and contractual aspects", *Unpublished dissertation, Royal Institute of Technology in Stockholm*, 2014.
- [40] Wong, P.S.P., Cheung, S.O., and Ho, P.K.M., "Contractor as Trust Initiator in Construction Partnering-Prisoner's Dilemma Perspective", *Journal of Construction Engineering and Management*, vol. 131, no. 10, October 1, 2005.
- [41] Washington Department of Transport, "Partnering field guide for WSDOT Projects", Washington Department of Transport, Washington. [Online] Available from: <https://www.wsdot.wa.gov/sites/default/files/2012/03/28/WSDOTProjects-Partnering-FieldGuide.pdf> [Accessed 02/01/ 2020]
- [42] Yoke-Lian L, S. Hassim, R. Muniandy, and Law Teik-Hua, "Review of Subcontracting Practice in Construction Industry", *International Journal of Engineering and Technology*, vol. 4, no. 4, pp. 442-445, 2012.