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Research Article
Improvement for the Supply Chain Collaboration on the Construction Projects for the Government of Botswana

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Abstract

Background and Objective: Communication issues have been revealed as some of the problems within some government projects in Botswana. However, a proper and formal collaboration is one of the important features in supply chain management which can decrease these issues. Therefore, this study was proposed to build up a way of motivating long-term supply chain relations within construction projects. This was in order to bid for an arrangement that will enhance improvement in construction project management. The contractors' collaborative activities were investigated because they are one of the main parties in a main contract with the government. They are also forming another platform for a construction supply chain by dealing with sub-contractors and suppliers. **Materials and Methods:** This study was conducted through an empirical investigation. Data were collected from contractors engaged in local government projects. Closed-ended questionnaires were dispersed so that comparison of characteristics could be done to look for patterns that give significance to the study. About 82 questionnaires were circulated but atleast 38 responses were received as acceptable. A sample t-test was used to check if a sample mean is significantly different from an assumed mean which was fixed at 95%. One-way ANOVA test was also carried out to investigate the fairness of different population means. **Results:** The findings of this study work concluded that lack of proper supply chain collaboration in construction projects still exist. The findings of this research study were unique in their nature because they lead in a recommendation to promote business continuity in construction projects. **Conclusion:** Values that are associated with global development mechanisms, like a strong supply chain within construction sector have to be stimulated and held in high esteem in construction projects. If prepared earnestly, positive outcomes of overcoming time delays and cost overruns will be achieved. Overall population was not surveyed therefore the small sample size restricts the prospect for generalisation but it opens up for future research.

Key words: Project management, supply chain collaboration, construction projects, construction industry, improve performance

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Not very long in the past, it was noted that engineers, construction managers and contractors do not typically consider the supply chain management, even though they deal with and make decisions on it on a daily basis[1]. Ignoring the importance of project planning procedures is amongst the substantial reasons that cause project failure in construction projects[2]. Performance is influenced by the organization's alignment with its environment[3]. To lead to better procurement practices, it is necessary to revise procedures to modernize the existing ones[4]. Nguyen and Chileshe[2] indicated that the incompetence of government policies and poor moral code in doing business by project participants contribute to project failure. In the case of Botswana, improper planning and communication issues between parties have been revealed as some of the problems within some government projects[5]. However, construction firms' lack of supply chain alignment is the main instigator for on-site complications[6]. This is because, there is no clear guiding principle for collaboration in construction projects[7,8]. Collaboration is one of the important features for a successful SCM and that it can reduce waste and significantly increase throughput[9]. Collaborative decision-making is required throughout the project, irrespective of the contract type[10]. Benefits can be achieved by members of a supply chain who are willing to invest the time and energy required to exchange information, improve communication and share responsibilities[11]. Suppliers' management is imperative for the team because it can keep up their buyers by providing a quality product and cost reduction which will give their partners a benefit.

According to Love *et al.*[12], SCM in construction is the system of facilities and activities that can contribute a profitable worth to the functions of material procurement, design development, service and contract management. Supply-chain management focuses on the operations involved in the production process addresses the processes involved in the delivery of the client's need[13]. In construction projects, there are materials and the construction chain, which separates the procurement and management operations[1]. However, the majority of approaches for managing supply chains are not directed specifically to address the characteristics of construction projects, even though they can be altered to suit the construction sector. The characteristics of construction projects involve temporary endeavours. Companies bring their capabilities and skills to start a construction project, depending on its position in the entire construction process[14]. The background of temporary and complex nature of construction projects leads to higher expenditures but with lower productivity as compared to other industries[15]. This has been shown by poor communication which leads to significant negative performance and directly impacts the customer by increasing project completion time and cost[8]. Amongst hurdles for SCM in the construction industry include, "poor level of logistical competence, strong project focus, lack of direction for creating strategic alliances, failure to fit in the company's internal procedures and the attitudes and habits"[1]. That is why supply chain processes in the construction industry need to be re-organized so that robust cost reductions can be attained[16]. It would be preferable to seek expertise and mutual cooperation with suppliers and subcontractors, however, mostly main contractors would seek price and risk discounts[17]. They observed that this leads to the situation where suppliers and subcontractors are not integrated into the design and planning of the work that they are responsible for executing. Mostly because the relationship between the client and contractor are not in direct competition with one another[18] and contractors may feel at ease if other members are left outside. A collaborative and open culture is essential but directives and rewards to foster them must be put in place to guide and monitoring will be necessary[9]. This can be used as a strategic perspective to do good to members in the projects' collaboration supply chain. To harbour collaborative culture there is a need for external trust and exchange of some important information for the supply chain to be robust. To shield shareholder's confidential information, a robust control structure can be arranged. The contracting parties can assign accountabilities to managers to be sure third parties are mindful of their ethics and then made aware that major adverse penalties can be instigated by the loss of private information[19].

There is a decrease in workload if teams share and make use of their teammates' knowledge[20]. The project management team normally share most of the important knowledge during informal setups. The use of knowledge management practices may improve project performance and augment the competence to undertake bigger projects[21]. Contractor's know-how at the end of the conceptual design phase, before the plan approval process is started has to be made possible[22]. In addition to that, training and development in the construction industry are necessary to grasp and drill best practices in supply chain management as tools for both decision making[4]. To get enhanced the outcomes, the greater the level of collaboration within the teams is needed. If left pending, main contractors can do different conceited control to supply chain companies in a project[23]. This is fueled by the

fact that suppliers are not made to account for forecasting and progress reporting[24] in the projects. The contractor and subcontractors have to develop and plan feasible tactics and key suppliers could propose material alternatives[12]. Various participants of a supply chain may view the supply chain collaboration level differently depending on the alternative ways of setting boundaries around the expected outcome. The main objective was to have suppliers and subcontractors included in this win-win situation because sometimes they are left outside the loop. The aim of this research was to find ways to improve supply chain management in construction projects. The research objectives were to investigate the construction team collaborative activities and to recommend exercises to modify relationships. The scope is only limited to building projects that are commissioned by the local government of Botswana. This study was to make a contribution to the field of knowledge in supply chain management by contributing to both college circles and the construction industry of Botswana. It will contribute by adjusting the method of interactions for a partnership that can be adopted for government project management to improve performance. The conclusions were derived from the summation of the findings and assessing arguments to sustain conclusions within the context of the supply chain.

MATERIALS AND METHODS

The use of methodology to examine collaboration within the industry was necessary so that proper conclusions and recommendations are made. This study specifies the methods and procedures which were used for collection and analyses. It also justifies the methods and processes that were used to collect data which is inclusive to the approach of the research processes. An empirical research data were based on direct experience or observation[25], through a survey method and a purposive sampling was adopted. The study was carried out in Botswana in 2017 and the database of contractors was acquired from Local Government technical departments. Furthermore, it was a cross-sectional research design to collect information from respondents at a single point in time without any attempt to follow up overtime[26]. The data collected precisely deals with contractors with an approval from the ministry that deals with research. Closed-ended questionnaires were dispersed so that comparison of characteristics could be done to look for patterns that give significance to the study. Questionnaires accompanied by a covering letter were sent to construction companies directly involved with some government projects. The empirical discoveries from the questionnaires were analyzed quantitatively using descriptive statistics.

The majority of respondents in these construction companies were company directors followed by project managers. In addition to that, about 71% of the respondents had 5 years of experience or more in the construction industry. The statistical package for social sciences (SPSS) version 22 software from International Business Machines Corporation was used to analyze quantitatively all questions. Cronbach's alpha values were measured for reliability within a group and were accepted if above 0.70 but unacceptable if below 0.5[27-29]. When comparing the means, a sample t-test was used to check if a sample mean is significantly different from an assumed mean which was fixed at 95%. The null and alternative hypotheses were set out as H_0: $\mu \leq 3$ and H1: $\mu > 3$. These 3 hypotheses signify the neutral preference on the Likert scale. When $p<0.05$ then it means the t-value is positive, then the null hypothesis is rejected and the alternative hypothesis is accepted[30]. Then a decision would be the respondents have not agreed or have rated it as low. For the cases where the student t-test was done and the Levene's test for equality of variance failed, the equivalent variance was not assumed. In addition to that, there was no rejection of the assumption of homogeneity variance if it was more than 0.05 and this means the variances have equal significance. Furthermore, a one-way ANOVA test which is the analysis of variance was carried out to investigate the fairness of different population means. The test was done across the categories of project monetary ranges. This was done to determine where possible the use of actions known in the different categories. Where it was less than 0.05, then the *post hoc* test would be conducted using "Student Newman Keuls" (S-N-K), to detect sample means that were significantly different from one another. About 82 questionnaires were circulated but atleast 38 responses were received as acceptable and not biased. The results of a survey are biased if the return rate is lower than the range of 30 and 40%[31].

RESULTS

Table 1 displays aspects of collaboration in projects. The items included making arrangements after award, decision synchronizations, expertise and resource sharing and risk sharing. The items were tested for reliability and the Cronbach's α was 0.706 hence accepted for reliability. In addition to that for all the activities or items, the $p<0.05$ and the t-values were all positive. Therefore, the null hypothesis was rejected and the alternative hypothesis is accepted. The ANOVA indicated that these classes were comparable except for decision synchronizations. It was then assessed with Student-Newman-Keuls (S-N-K) for *post hoc* results and did not reject the assumption of homogeneity variance since the

Table 1: Aspects of collaboration in projects

Cronbach's α: 0.706		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Arrangements after award	0.000	32.775	4.0000	4.1200	4.3333	4.1316	0.747
2	Decision synchronizations	0.000	30.075	4.1429	3.6800	4.5000	3.8947	0.047
3	Expertise and resource sharing	0.000	35.882	4.1429	3.8000	3.8333	3.8684	0.491
4	Risk sharing	0.000	30.889	3.7143	3.6800	4.1667	3.7632	0.365

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

Table 2: Guiding principle displaying level of collaboration

Cronbach's α: 0.728		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Engaging the government	0.000	23.213	2.0000	1.9600	1.8333	1.9474	0.835
2	Management representative	0.000	25.807	2.0000	1.8400	2.0000	1.8947	0.599
3	Time and materials contract	0.000	18.500	1.8571	1.8800	1.8333	1.8684	0.986

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

Table 3: Issues that impacts project success

Cronbach's α: 0.731		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Lack of openness	0.000	33.521	4.4286	4.6000	5.0000	4.6316	0.472
2	Supply chain processes	0.000	34.160	4.5714	4.5200	4.8333	4.5789	0.717
3	Lack of collaboration delays	0.000	25.741	4.8571	4.4800	4.3333	4.5263	0.654
4	Positive prior ties	0.000	25.711	4.4286	4.2800	4.8333	4.3947	0.524

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, Monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

Table 4: Essentials needed for collaboration framework

Cronbach's α: 0.742		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Open culture	0.000	39.806	4.1429	4.0800	4.0000	4.0789	0.925
2	Early involvement	0.000	46.620	3.8571	4.1200	4.1667	4.0789	0.488
3	Directives and rewards	0.000	29.816	3.8571	3.9600	4.1667	3.9737	0.796
4	Incentives and rewards	0.000	30.075	4.0000	3.8400	4.0000	3.8947	0.849
5	Contractor's knowledge	0.000	23.299	3.8571	3.6800	4.3333	3.8158	0.370

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

item displayed results more than 0.05 and this means the variances have equal significance. Therefore, the insights do not differ across all classes. Table 2 displays base of association focusing on engaging the government, management representative, time and materials contract to give a clue on the level of collaboration. The items were tested for reliability and the Cronbach's α was 0.728, hence, accepted for reliability. In addition to that for all the activities or items, the $p<0.05$ and the t-values were all positive. Therefore, the null hypothesis was rejected and the alternative hypothesis is accepted. The ANOVA indicated that these classes were comparable. Therefore, there was no need for *post hoc* results. The perceptions do not differ across all classes. Table 3 reveals issues that impact project success and amongst them were lack of openness, supply chain processes, lack of collaboration delays and positive prior ties in the construction context. The results exhibit that the items were tested for reliability and the Cronbach's α was 0.731, therefore, accepted for reliability. All the activities had the $p<0.05$ and the t-values were all positive. The null hypothesis was rejected and the alternative hypothesis is accepted. The ANOVA indicated that these classes were comparable there was no need for *post hoc* results. The insights did not significantly differ across all classes. Table 4 displays essentials needed for collaboration framework. They are collaborative and open culture is needed in the framework, early involvement of key team members, directives and rewards needed in the framework, incentives, rewards and the use of contractor's

Table 5: Other fundamentals needed for collaboration

Cronbach's α: 0.716		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Collaborative supply chain	0.000	43.720	4.0000	4.4400	3.8333	4.2632	0.033
2	Other members in contract	0.000	48.173	4.1429	4.1600	4.0000	4.1316	0.808
3	Clause for collaboration	0.000	27.793	3.4286	4.3200	3.6667	4.0526	0.030
4	Team resources	0.000	45.575	3.8571	4.0800	4.0000	4.0263	0.640

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

Table 6: Risk issues which were profiled to resolve group effort

Cronbach's α: 0.695		One-sample test		Means				
Rank	Item	p-value	t-value	Class 1 (<1)	Class 2 (1-5)	Class 3 (6-10)	Total	**ANOVA test
1	Improper planning	0.000	43.154	4.2857	4.2000	3.8333	4.1579	0.335
2	Payments for works	0.000	48.189	4.4286	4.2400	4.0000	4.2368	0.374
3	Communication	0.000	41.201	4.4286	4.2000	4.1667	4.2368	0.683
4	Apportionment of penalties	0.000	33.538	4.0000	4.0400	3.8333	4.0000	0.834

**Statistical significance of the comparison between means categories of contractors with project monetary range of less that 1 million BWP, monetary range of between 1-5 million (BWP) and monetary range of between 6-10 million (BWP)

knowledge. The results display that the items were tested for reliability and the Cronbach's α was 0.742, therefore, believed to be reliable. All the activities had the $p<0.05$ and the t-values were all positive. The null hypothesis was rejected and the alternative hypothesis was accepted. The ANOVA indicated that these classes were comparable there was no need for *post hoc* results. Therefore, the insights did not significantly differ across all classes.

Table 5 displays other fundamentals needed for collaboration framework. The pieces were that government needs to form a collaborative supply chain, main contract to include other members, the main contract should include a clause for collaboration and lastly, incorporate team members' resources to form a consolidated supply chain. The items were tested for reliability and the Cronbach's α was 0.716, therefore, accepted for reliability. In addition to that for all the activities or items, the $p<0.05$ and the t-values were all positive. Therefore the null hypothesis was rejected and the alternative hypothesis is accepted. The ANOVA indicated that these classes were comparable except for government needs to form a collaborative supply chain and the main contract should include a clause for collaboration. They were then assessed with Student-Newman-Keuls (S-N-K) for *post hoc* results and did not reject the assumption of homogeneity variance since the item displayed results more than 0.05 and this means the variances have equal significance.

Lastly, Table 6 shows risk issues which were shortened to resolve group efforts in construction supply chain. They are improper planning, payments for completed works, communication issues between parties, apportionment of penalties and benefits. The items were tested for reliability and the Cronbach's α was slightly below the 0.7 but was accepted as was very close. All the activities had the $p<0.05$ and the t-values were all positive. The null hypothesis was rejected and the alternative hypothesis was accepted. The ANOVA indicated that these classes were comparable there was no need for *post hoc* results. Therefore, the insights did not significantly differ across all classes.

DISCUSSION

The study showed that there is an insignificant perception between all the categories studied despite their differences in project monetary range. The analyses in this study show that supply chains in the construction context are kind of difficult to bring together. Nevertheless, it is important to find ways of dealing with these complex issues so that improvement can be achieved. This was also observed in the study of Thunberg *et al.*[6], who indicated that supply chains in the construction context are a complex and challenging task. The analysis in this study points out that lack of collaboration in construction projects do delay progress in construction projects and this was indicated by means of all the categories studied. It leads to poor decision making, which can be avoided, by improving collaboration. This happens because of lack of confidence towards each other and it lends support to Akintan and Morledge[32], who observed that it influences the delivery processes in a number of ways. It also signals that there is a principal symptom which needs to be attended by improving supply chain in projects. On the other hand, if collaboration can be improved they will plan critical activities together and it will create an opportunity for resourceful and

innovative efforts. The average mean showed within all categories indicated that respondents agreed that there are issues of poor planning within their informal collaboration which is expected as long as uncertainties within them exist. Without proper collaboration, there won't be alternative exercises arranged to solve difficulties that may occur during project implementation.

All the categories studied has shown that the lack of openness in their supply chain impact on their project progress. If parties in a supply chain remain secretive towards one another than a lot of mistrust between them will be created. This shows that there is a lot of mistrust in construction supply chains which was also confirmed by the study of Akintan and Morledge[32]. However, promotion of openness and trust can be achieved through good supply chain collaboration and repeated interactions within formal agreements. This will assist in building a formidable team that plans together and results of bonding will be achieved. Lessons learnt can be recorded and traced if both parties are showing a sign to want to have a strategic focus together of building their businesses. Then the study of Pala *et al.*[23], which says the demand for traceability to manage the extended supply chains is growing, will indeed be realized. The analysis revealed an optimistic stand that a collaborative and open culture is essential for construction projects. This will build up the chain if it is backed by the main employer. Hence the respondents continued to agree that the government needs to form a collaborative supply chain designed to react swiftly where suppliers, subcontractors and the contractors are used jointly to plan when bidding. This is in line with the study of Preston *et al.*[33], who advocated that, other players like suppliers may possibly be allowed to propose some events in order to strengthen knowledge supplementation. However, it has to be prearranged to work safely with numerous tiers. This will deliver substantial benefits in improving the relationships that are already scratched. Majority of the respondents agreed to the need to improve the approach to communication in order to improve. If communication engagements are not distinctive issues of trust issues will rise. This supports the study of Gustavsson and Gohary[34] and if communication is implemented well it will bring out clearly where achievements were established and even indicate where failures are experienced and will contribute to project performance. Communication will also help on how to handle risk issues, because matters of sensitivities of risk in collaboration, also apply in construction projects. Respondents slightly indicated that they share risks with their supply chain members even though the average mean is slightly above the neutral point. However, this could not be confirmed in this study because other members of the supply chain were not studied, but it is important for chain members to plan to share risks. In the event that the other party is having disrupted income, it will not take the business completely down as the other members in the chain will act as a shock absorber or a buffer zone. The results indicated that it is important in collaborations to consider embracing the resources that belong to other firm's outside their boundaries and give incentives for them. However, it will depend on which resources are available within the chain and how the allocation will benefit the project. The respondents also agreed that expertise and resource sharing are some of the problems faced when collaborating. Class 1 category indicated the highest mean, though all of them did not score below the neutral position. This must be a sign that from contractors of the lower level, there is an expectation for assistance or a need to be sharing expertise so that they learn from it. Therefore, providing flexible regulations may assist the improvements for supply chain in construction projects. The analyses show that the respondents agreed to the apportionment of penalties and benefits. The formal collaboration will assist in the distribution of them and measure to the parties involved their rights and interests accordingly. In addition to this, supply chain methods in the construction industry need to be arranged and this was shown by the majority of categories studied. This will be in a pursuit to create values for the construction supply chain so that robust cost reductions can be attained. However, this will need them to build methods that bond them in a strategic and legit ways. The restructuring will even think through on how to incorporate supply chain collaborations in existing contracts. This was also suggested by Ejohwomu *et al.*[35] and it will bring the comprehensive improvements. The study also showed that for supply chain collaboration to work effectively there is a need to add or modify some clauses in the contract to accommodate that. This will adjust the types of contract chosen and the risk shared between the buyers and sellers will be determined by the contract type hence also have to be revised. Furthermore, the results of the study have indicated that contractors have shown to agree that the main contract should not only include a clause that allows formal collaboration but to also specifically include both suppliers and sub-contractors. This will encourage suppliers and sub-contractors to think together to address concerns within projects. This then backs up the study of Arantes *et al.*[36], who calls for the need to generate conditions and promote lasting relationships within construction supply chains. Therefore, the use of old contracts which have not been reviewed or atleast substantially revised to include new inclinations would work against improving collaboration in construction projects. In

addition to that, improving the old contracts will assist to reach effective performance, which is one of the strategies in supply chain management. The will to sign a "Time and materials" contract with the supplier as part of the main contract did not present a clear agreeable score, however, it was not totally refused. A clear-cut in this issue will help suppliers to assist to contribute in the supply chain know they are recognized, partners. They will continue to be dedicated to supplying as they will be part of the legally recognized service partners. It is important to have suppliers who can provide quality goods which can be provided at competitive prices and mostly as urgently as required. Therefore, respondents were asked if they find it necessary to have supplies provided as quickly as possible when there is a need to do that. The analysis disclosed that after awarding of the contract, respondents do have arrangements where urgent requirements can be met with their suppliers. An association between them is established but does not point towards any formal supply chain. This lends support in Touboulic *et al.*[37], when they argued that sustainability in relationships means acknowledging that dependency on supplier's increases due to the imperative of managing some resources. Another problem observed was the issue of payments for completed works. All categories indicated that it is still an issue. There is no way any business will continue spending but with no reimbursement for their expenditures. The study indicated it as a risk issue and this hitch works against improving collaboration in construction and it is in agreement with the study conducted by Amoatey *et al.*[38]. Therefore, meeting the payment contractual agreements are very important in good supply chain collaboration.

Respondents did indicate that decision synchronizations are faced when working together. It is necessary to harmonize and unify how they are made to avoid loopholes. This was also observed by Ahmed *et al.*[1], who pointed it towards failure to fit in the company's internal procedures. Though class 2 scored slightly below the other groups mostly they are still in agreement. Therefore this can be made from planning to make a smooth transition during project execution. All categories in the study indicated that early involvement of key team members (like suppliers) in bidding is essential. The success of delivering projects depends on what was planned earlier hence their early contribution will improve their collaborate arrangements. This is in support of Ibrahim *et al.*[39], however, there has to be a formal agreement on how they are brought in. The study indicated that the use of contractor's knowledge is beneficial in the private sector but not completely used in the public sector projects because of tough governmental regulations. The use of this knowledge will even assist in issues of achievable specifications. This will strengthen and improve collaboration as indicated by Lavikka *et al.*[10]. Respondents confirmed that they do not have a management representative assigned specifically for assuring compliance with collaboration agreements. As much as there is a need to appoint experienced personnel like a client requirement management as recommended by Yu and Shen[40], it is also imperative to assign a personnel to promote supply chain management. However, a robust managerial aptitude for culpability needs sanctioned personnel to supervise it. This will administer both internal and social conflicts within the teams effectively as noted by Al-Sibaie *et al.*[41]. The respondents were studied on whether they believe positive prior ties with all construction supply chain have a substantial effect on the growth of reliance at the beginning of the project. The analysis certainly shows that all categories do agree that positive prior working relations have a substantial effect on the improvement and growth of relationships, which backs the study of Buvik and Rolfsen[42]. Therefore, selecting partners basing on capability and strategic alignment to collaborate for the long term is necessary. Nevertheless, the main contractor still has an obligation to focus on the construction activities on the site and having to achieve the constraints of cost, time and quality.

The respondents were studied on whether directives and rewards to foster collaboration needs to be put in place to improve collaboration. A good amenable result was not obtained but it was above the neutral value. Nevertheless, directives will provide an account of operational guide on how to incorporate them into the existing agreements. In addition to this respondents indicated that incentives are needed when collaborating therefore, necessary to be included in agreements. The rewards in place to nurture collaboration may not be understood but respondents agreed that incentives are needed when collaborating. However, without directives, the worst consequence might be when the stronger alliance is more important than the benefits intended for the project as cautioned by Buvik and Rolfsen[9]. Lastly, the majority indicated that they did not engage the government regarding some supply chain conflicts they face. There is a need because as the main pivot on construction projects and also responsible for policy formulation, the government will suggest or make improvements seem possible. With improved collaboration, the members of the chain will join each other's organisation operation processes and also assist each other in coordination. This will promote business continuity and encourages all stakeholders to improve, to earn trust and to deliver with reduced risks. However, without it, they will only be in relationships because of purchasing association which will not assist the construction industry in achieving growth in supply chain management.

CONCLUSION

The bureaucratic waste of disjointedness in collaboration may very well, have been encouraged by the use of old contracts which have not been reviewed or atleast substantially revised with the inclusion of new trends that aid project routine. Incentives like awards have to be targeted to distinguish those businesses that support formal supply chain collaboration in the construction sector. This will also recognize and uplift their unique supply chains teamwork within a formal supply chain contract. These have to be awarded to firms that will be selected based on their ability to overcome challenges through the state-of-art and measurable means between service partners. Supply chain professionals can be used to evaluate how the collaboration has yielded significant results and augmented the supply chain line of work. Although this study makes an important input to the SCC literature and implications in the industry of construction, it has more limitations that open up for future research. Because of the fact that overall population was not surveyed therefore, the small sample size restricts the prospect of generalisation. This makes the caution to deduce the results with precautions. Furthermore, the majority of the respondents who had more than 5 years of service did not respond to the questionnaire and the outcome of the study might be less balanced as experienced practitioners tend to be more rational. Therefore, there is a need to study those that are experienced and upcoming studies may collect data from other construction projects within Botswana to make comparisons.

SIGNIFICANCE STATEMENT

The study discovers the adjusting methods of interactions for a formal connection that can be adopted for government project management to improve the supply chain. The findings of this research study are unique in their nature because they promote business continuity in construction projects supply chain despite the fact that construction projects are complex in nature. It encourages all stakeholders to improve, to earn trust and to deliver with reduced risks. This study will help the researcher to uncover the critical area of collaboration that backs project management. This will improve collective decision making in supply chains for construction projects. It stimulates values that are associated with global development mechanisms, like a strong supply chain within the construction sector.

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