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ASSESSING THE IMPLICATIONS OF PUBLIC SECTOR PROCUREMENT ON CONSTRUCTION HEALTH AND SAFETY MANAGEMENT IN ZIMBABWE

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Abstract
The construction industry significantly contributes to economic and social development of nations. Yet the industry also contributes extensively to fatal and non-fatal work-related accidents. Regrettably, investment decisions in the industry continue to be made with disregard of Health and Safety (H&S), and where it is given attention it is mostly too late in the project lifecycle. However, upstream decisions made at procurement stage have a considerable impact on site H&S management. This research therefore explores the level of H&S integration in public sector procurement, and its impact on construction H&S management in Zimbabwe. The primary data was collected in Harare and Bulawayo though self-administered questionnaires, and a review of public sector procurement regulations, while the secondary data was collected through a review of published literature. The results of the study show that traditional factors such as bid amount, financial status, and project delivery time are given preference ahead of H&S when procuring contractors for public sector projects. Tight budgets, late appointment of contractors, and weak contractual provisions collectively create ideal conditions for disregarding H&S at procurement. Although these results are consistent with those obtaining in other developing countries, they depict a situation in which H&S management is not holistic. A review of procurement frameworks and commitment of clients to financially support the contractor's H&S programme are expected improve the situation. The results of this study are expected to influence public procurement policy direction and the setting of priorities for action to improve construction H&S management in Zimbabwe and elsewhere.

Keywords: Health and Safety, Procurement, Public sector, Zimbabwe

1 Introduction

The construction industry significantly contributes to economic and social development of nations. Yet the industry also contributes extensively to global statistics of fatal and non-fatal work-related accidents. To demonstrate the extent of the H&S management problem, the International Labour Organisation (ILO) estimates that accidents and work-related diseases cause 2.34 million fatalities annually around the world (ILO, 2013; ILO, 2014). In the construction industry, 60 000 fatal accidents are recorded per year on construction sites worldwide (Lingard *et al.*, 2008; Phoya, 2012). In Zimbabwe, the building and construction sector has the highest rate of H&S non-compliance (Mutetwa, 2010; NSSA, 2012) and against that background; Government admits that the country is a long way from attaining the optimum level of OSH performance (NSSA, 2015).

The cost of occupational injuries is borne by employees and their families, government, and employers (ILO, 2013). The effects, which include compensation, medical expenses, lost earnings, and replacement training (ILO, 2014) play a significant role in the spread of poverty and have a negative impact on sustainable development (ILO, 2013). Globally, several response strategies have been put in place to address the H&S problem and these include, but are not limited to institutionalisation of H&S management, formulation of H&S policies, passing of legislation, and the establishment of H&S institutions. However, a major shortcoming of these interventions is their dependence on contractors to manage construction H&S. Consequently, too many workers remain exposed to an unacceptable level of hazards and risks in the industry (WHO, 2006; Abbas *et al.*, 2013). Previous studies note that contractors perceive H&S compliance as an economic burden, which severely impinges on their already slim profit margins (WHO, 2002; Agumba and Haupt, 2009), hence insufficient resource provision for H&S.

Studies pertaining to root cause analysis of accidents reveal that many on-site accidents can be attributed to professional or managerial decisions arising well before work commences on site (Lingard *et al*., 2008; HSE, 2003). Accordingly, there is a growing trend for H&S management responsibility to be driven up the supply chain, and be partially borne by construction clients, and the designers of buildings and facilities (Lingard *et al*., 2008). However, the fact that little has been written regarding the impact of choice of contract strategy on H&S performance indicates a major oversight in the way the issue has been dealt with thus far (Lingard and Rowlinson, 2005). McAleenan (2010) notes that H&S in construction is an integral aspect of the whole process from the time the initial thoughts are scribed down and the concept developed through to the final stages of the structure's life. A study conducted by Smallwood (1997) demonstrated that clients can positively or negatively influence H&S through pre-qualifying contractors in terms of H&S, and directly through conducting H&S audits. Therefore, integrating H&S in procurement should go a long way to improving H&S performance on construction projects. According to Harding (2014), responsible procurement should take into account not only the financial value of the contract, but also the risks of the tasks involved.

In public sector procurement, government has a leadership role to play in preventing work-related deaths and injuries by ensuring their construction projects are managed safely (Worksafe Victoria, 2010; McAleenan, 2010; ASCC, 2006; Okorie *et al*., 2014). Public authorities can exert influence on duty holders by making improved H&S performance a condition of eligibility for them to participate in government contract / tender processes (Lingdon, 2011). Unfortunately H&S is not a priority when businesses are choosing contractors – it is overlooked altogether (Harding, 2014; Okorie *et al*., 2014). In Botswana, Mwanaumo *et al*. (2014) note that H&S is non-existent during project planning stages, while Lingard *et al.* (2008) indicate that in the UK, client-led H&S management in the planning and procurement of construction work was not well established. In that case, Longdon (2011) implores that more could be done to embed H&S guidance among public sector clients. This research, which is part of a broad research project pertaining to integrating sustainability principles in construction H&S management, explores the level of H&S integration in public procurement, and its effects on construction H&S management within Zimbabwe's public sector construction.

2 Literature Review

Public procurement refers to the acquisition of goods and services by government or public sector organisations (Uyarra, 2014). It is one of the key economic activities of government utilised for achieving economic, social, and other objectives (Thai, 2001). The economic significance of public procurement outlays is phenomenal and is conservatively estimated as

follows: over €2 trillion in 2009 (European Union, 2011), approximately 10 % of the Korean GDP (Choi, 2010); the public sector commissions approximately 40% of total construction output in the UK each year (Longdon, 2011). The considerable size of public procurement has far-reaching implications for H&S management. Previous studies (ASCC, 2006; Worksafe Victoria, 2010; Okorie *et al*., 2014) confirmed that the public sector as a major procurer of building and construction services, policy maker and regulator, has a direct influence on construction H&S management. According to Smallwood & Venter (2012), clients make key decisions concerning project budget, project objectives, and performance criteria and some of the objectives may create the type of pressures and constraints known to have a significant impact upon H&S during construction. The Australian Safety and Compensation Council (ASCC) (2006) and the American Industrial Hygiene Association (AIHA) (2005) note that if governments, at all levels, integrate H&S requirements into all stages of the procurement process, suppliers will need to demonstrate their ability to meet these requirements. According to Rwelamila and Smallwood (1999), incorrect choice and use of procurement systems contribute to neglect of H&S by project stakeholders. Previous studies (ASCC, 2006; Alli, 2008; Worksafe Victoria, 2010) observe that including H&S during procurement leads to improved productivity, reduced costs, better prediction and management of production and operational costs over the lifecycle of the project, and innovation in design and construction. Research further shows that the cost of investing in H&S is less than the cost of occupational hazards (cidb, 2009; Huang 2011; Emuze and Smallwood, 2012).

In spite of this evidence, Lingard *et al.* (2008) argue that constructors bear the largest portion of responsibility for construction H&S. Unfortunately, dependence on contractor-centric H&S management has not yielded the required results. The problem is further compounded by lack of government commitment (Mwanaumo *et al*., 2014; Mwombeki, 2006 in Chiocha *et al*., 2011), bribery, corruption and political interference (cidb, 2011; Okorie *et al*., 2014). In the UK, Crosthwaite (2007) reports that public sector clients still have a relatively narrow view of their involvement in project H&S. A study by Gibb & Bust (2006) involving five African countries (Botswana, Egypt, Malawi, Nigeria, and South Africa) noted that clients are not supportive of H&S initiatives. In Botswana, Mwanaumo *et al*. (2014) point out that H&S within the contract is not even a point of discussion for inclusion at the planning stage.

2.1 Procurement Method

The client's selection of project procurement method is particularly important because this dictates when and how other key project stakeholders will be engaged to advise on H&S in the project (Lingard *et al*., 2008).The two primary methods of contracting are single prime contract (the design-bid-build model) also known as traditional contracting and design-build construction (AIHA, 2005). The traditional method is characterised by the separation of design and construction processes. However, the high level of differentiation and specialisation associated with the traditional approach leads to a situation where H&S is not considered during the early phases of the project (Lingard and Rowlinson, 2005). However, to counter this problem, clients can prequalify and select only those contractors who are fully qualified by virtue of their H&S programs and performance (Huang, 2011; Blarke, 2013; Lingard *et al*., 2008). On the other hand, the design-build method is a unitary approach characterised by single-point responsibility offered to the client by the contractor, and the opportunity for overlapping the design and construction phases (Lingard and Rowlinson, 2005). Design-build projects go under many names; for example, design-build, design and build, design manage construct, design and manage, build operate transfer (BOT), build own operate transfer (BOOT), build own operate (BOO), or turnkey. By adopting single-point responsibility, the management of H&S should be more readily possible in design-build than with other contract strategies (Lingard and Rowlinson, 2005).

2.2 Contractor Selection Criteria

Contractor selection is a critical activity that plays a vital role in the overall success of any construction project (Palaneeswaran and Kumaraswamy, 2001). Among all factors that may affect the selection of a contractor, cost or price consideration has for a long time been the main evaluation factor (Huang, 2011). Although the public sector has a long history of using the lowest bid as the award criterion for contracts, reliance on non-price criteria is increasing (Waara and Bröchner, 2006; Lorentziadis, 2010) and the best or most economically advantageous tender is becoming a widespread approach for contractor selection . For instance, Bergman and Lundberg (2013) note that in the EU, lowest price is used less frequently, and instead, supplier selection methods that combine price and quality into a total score are used more often (Ballestros-Perez, 2015). Apart from enhancing H&S through the use of multi-criteria weighting of different variables, it also enhances the integrity of the evaluation process and to reduce the risk of unfair bias or corruption (Lorentziadis, 2010; Bergman and Lundberg, 2013). A diversity of factors are used to evaluate contractors and these include quality, technical merit, aesthetic, delivery date and delivery period, or period of completion and such additional criteria including safety, durability, security, and maintenance (Zedan and Skirtmore, 1997; European Union, 2004) and functional characteristics, environmental characteristics, running costs, cost effectiveness, safety, after sales service and technical assistance (European Union, 2004); contractors' current work load, contractors' past experience in terms of size of projects completed, contractor's management resources, time of the year (weather) and contractors' past experience in terms of catchment, i.e. national or local (Holt *et al*., 1994); technical expertise, and cost (Watt *et al.*, 2010); the bid amount; time of execution, and quality of previous work (Herbsman, 1992 cited in Zedan & Skirtmore, 1997). Nonetheless, H&S features less frequently among the aforementioned criteria signifying that little consideration is given to it during contractor procurement. However, the selection criteria in public sector procurement is sometimes circumvented due to corruption (cidb, 2011; Okorie *et al.*, 2014) and other unethical behaviour by public officials leading to the award of contracts to contractors with poor H&S records (Okorie *et al.*, 2014).

3 Research Methodology

The study used an exploratory design due to a dearth of Zimbabwean literature pertaining to this subject. An exploratory design explores the possibility of obtaining as many relationships as possible between different variables (Panneerslvam, 2004) and is particularly suitable for subject areas where there is little experience to serve as a guide (Kothari, 2004). The primary data was collected through questionnaire surveys, and interviews. Purposive sampling was used to select survey respondents. According to Leedy and Ormrod (2013), in purposive sampling, people or other units are chosen, as the name implies, for a particular purpose. Thirty (30) semi-structured questionnaires, developed based on a review of previous work by Huang (2003), ASCC (2006), Worksafe Victoria (2010), and Langdon (2011), were administered to members of the procurement technical committee within government departments, statutory agencies, and local authorities in Harare and Bulawayo. In addition to questionnaires, 5 follow-up interviews were also conducted. In a related study in Malawi, Chiocha *et al*. (2011) distributed 30 questionnaires and 21 responses were received and analysed. In spite of the small sample, the results of the survey can still provide a valuable purpose and provide enlightenment for follow-up research (Huang, 2003). A sample size of 30 items is often adequate (The Economist, 2003). According to Chan *et al*. (2001) cited by Priyadarshani *et al*. (2013) the sample or group size could be from 10 to 50 participants. Qualitative and quantitative procedures were employed for data analysis. Quantitative analysis was done using the Statistical Package for Social Scientists (SPSS) version 21 and Microsoft Excel, while content analysis was used for the interpretation of the qualitative data.

4 Findings and Discussion

4.1 Demographics of the Respondents

A total of 20 questionnaires, representing a 67% response rate, were successfully completed and analysed. The completed questionnaires were received from central government departments (50%); quasi government (45%) and local authorities (5%). The respondents were distributed as follows: Directors (25%), Deputy Directors (10%), Chief Quantity Surveyors (10%), Engineers (30%), Admin Officers (15%), Safety Officers (5%), and Accountants (5%). The respondents' work experience spanned from 4 to 30 years and the mean work experience is 14.05 years. The qualifications of respondents are as follows: Master's Degree (35%), Honours Degree (50%), Higher National Diploma (10%), and National Diploma (5%). It is evident from this demographic analysis that the respondents were highly experienced and qualified to provide valid and reliable assessments of issues raised in questionnaires and interviews.

4.2 Public Procurement Regulations in Zimbabwe

Public sector procurement is governed through the Procurement Act (Chapter 22:14) and its subsidiary regulations, Statutory Instrument (SI) 126 of 2015 Procurement (Amendment) Regulations. The Procurement Act is modelled along the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Public Procurement. UNCITRAL Model Law is premised on achieving competition, transparency, fairness, economy and efficiency in the procurement process (UN, 2014). These values are also enshrined in the Constitution of Zimbabwe and the Procurement Act which requires that public funds are expended transparently, prudently, economically and effectively. The Procurement Act mandates procuring entities (ministry, department or other division of the Government; or statutory body that engages in procurement; or any local authority) to procure goods, construction works and services for the state, statutory bodies, and other persons, with the supervision of the State Procurement Board (SPB). Prior to the promulgation of SI 126 of 2015, the SPB would procure, on behalf of procuring entities, construction works of a value exceeding $2million. Although the Act defines multi-criteria to evaluate tenders, the criteria are, however, 'devoid' of H&S aspects. Reference to H&S is implied through section 34(1) (d) which requires suppliers to have paid all taxes, duties, and rates for which they are liable in Zimbabwe, together with any contributions or payments due under the National Social Security Authority Act. This is, however, inconsistent with the Constitution which 'treats' H&S as a fundamental workers' right wherein every employee is entitled to just, equitable and satisfactory conditions of work.

4.3 H&S Considerations at Contractor Procurement

Table 1 shows the respondents' degree of concurrence relative to selected procurement issues and their impact on H&S management in terms of responses to a scale of 1 (strongly agree) to 5 (strongly disagree), and a mean score (MS) ranging between 1.00 and 5.00 and the midpoint score of 3.00. The results show that 6 out of 11 aspects have a MS $\geq$3.00 which indicates that respondents can be deemed to agree with a majority of the statements.

Table 1: Degree of concurrence with H&S related procurement statements

Statement	Response (%)						MS
	Unsure	Strongly Disagree (1)…...Strongly Agree (5)					
		1	2	3	4	5	
Considering H&S at procurement stage lead to reduced work-related accidents and diseases	0.0	0.0	5.0	0.0	30.0	65.0	4.55
The Procurement Act is silent on the need to consider H&S when procuring projects	17.6	5.9	5.9	23.5	41.2	5.9	2.82
Conditions of contract for public sector projects are silent on matters of H&S	10.5	21.1	21.1	5.3	42.1	0.0	2.47
Competitive nature of bidding for public sector projects forbid contractors to sufficiently provide for H&S in their tender	5.0	10.0	25.0	10.0	40.0	10.0	3.00
Public sector projects consider issues of H&S mainly at project implementation stage	5.0	5.0	15.0	10.0	50.0	15.0	3.40
Procurement officers lack requisite skills to evaluate tenders for construction H&S	10.5	15.8	10.5	21.1	36.8	5.3	2.74
Tight budgetary constraints contribute to non-considering of H&S by Procurement entities	0.0	5.0	10.0	10.0	60.0	15.0	3.70
Late appointment of contractors in the procurement process contributes to poor H&S performance during project execution	5.0	5.0	20.0	15.0	35.0	20.0	3.30
Tender documentation and processes provide for assessments at tender/contract award stage of contractors' proposals and potential performance with respect to H&S	10.0	5.0	40.0	15.0	25.0	5.0	2.55
H&S related information or risks are given to prospective bidding contractors	5.3	10.5	47.4	15.8	15.8	5.3	2.42
Construction H&S laws in Zimbabwe provide for minimal H&S provisions	5.3	5.3	21.1	15.8	42.1	10.5	3.16

The results from Table 1 reveal that consideration of H&S during contractor procurement can positively contribute to reducing work-related accidents and diseases. This variable has MS 4.55. A MS > 4.20 ≤ 5.00 equates to between agree to strongly agree / strongly agree. This result corroborates the contention of Cameroon *et al*. (2005) who concluded that effective planning for H&S is essential if projects are to be delivered without experiencing accidents or the health of site personnel.

The research also reveals that respondents perceive that certain procurement related practices may contribute to poor H&S management and these are discussed below.

- Tight budgetary constraints (MS 3.70). When MS>3.40≤4.20 it indicates that the interventions can be deemed to be taken between neutral and agree / agree. The majority of respondents (75%) perceive that budget constraints bedevil the public sector as a result of a non-performing economy, which contributes to non-consideration of H&S by public procurement entities;
- Late appointment of contractors (MS 3.40). In 58.8% of selected cases projects completed within the last five years, respondents indicate that contractors were procured at tender stage. Although this finding is consistent with the traditional procurement approach used on 78% of the selected projects, however, the stage of

contractor procurement is probably too late to take advantage of contractors' expertise (in terms of buildability and health and safety issues) (Longdon, 2011);

- Consideration of H&S during project implementation stage (MS 3.40). Respondents perceive that H&S is mainly considered during the construction phase of the project. This approach 'exports' H&S responsibility to the contractor. The results are, however, consistent with earlier findings (Lingard *et al*., 2008) that the constructor bears the largest portion for responsibility for construction H&S. Nevertheless, it is at variance with several studies (AIHA, 2005; ASCC, 2006) who argue that if government at all levels, integrate H&S in all stages of the procurement process, supplies will demonstrate the ability to meet these requirements, and
- Minimal provisions for H&S in Construction Regulations (MS 3.16). This finding reveals that respondents perceive that H&S issues are not sufficiently incorporated in construction regulations. Respondents also perceive that tender documentation and processes do not provide for assessments at tender / contract award stage of contractors' proposals and potential performance with respect to H&S.

The remaining aspects have MS>2.40≤3.00 which can be deemed to be taken between disagree to neutral / neutral. For instance, the effect of competitive bidding on H&S is rated at the midpoint (MS 3.00). On the other hand, respondents do not agree with statements that: procurement laws (MS 2.82) and conditions of contract (MS 2.47) for public sector projects are silent on H&S issues; procurement officers lack requisite skills to evaluate tenders for construction H&S (2.74); and H&S related information or risks are given to prospective bidding contractors (2.42).

4.4 Criteria for Selecting Contractors

The study noted that clients consider a number of factors when procuring contractors and these are presented on Table 2. The results show, in descending order, that traditional evaluation factors such as cost (bid amount), financial standing, project delivery time, and technical expertise and experience, are important when procuring contractors on public sector construction works because their MS are greater than the median value 3.00. However, H&S considerations, environmental considerations and quality fall below the median value 3.00 meaning that they are less important when procuring contractors for public sector projects. This finding concurs with conclusions of previous studies where the 'need for cost certainty' was the highest ranked criteria (Longdon, 2011) while the requirement to manage H&S is not a priority when choosing contractors (Longdon, 2011; Harding, 2014; Okorie *et al*., 2014; Mwanaumo *et al*., 2014).

Table 2: Criteria for procuring contractors

Criterion	MS	Rank
Cost (bid amount)	3.69	1
Financial standing	3.56	3
Time of execution	3.38	3
Technical expertise & experience	3.31	2
Quality	2.88	5
Environmental considerations	2.31	6
Health and Safety (H&S) record	1.94	7
Others (e.g. previous ligation & company requirements)	0.44	8

5 Conclusion and Further Research

Public sector procurement has the potential to influence construction H&S management. However, due to a number of factors, clients do not seem to emphasise H&S at this stage. This research determined that clients know that inclusion of H&S at procurement stage has a momentous impact on improving H&S performance on their projects. However, tight budgets, the competitive nature of procurement, late appointment of contractors, and weak contractual provisions provide ideal conditions for disregarding H&S during upstream decision making. Consequently, H&S aspects are left until project implementation stage. Accordingly, economically advantageous contractors who do not systematically manage H&S risks may be appointed at the expense of workers' H&S. The research therefore recommends a review of the procurement processes and frameworks to allow for participation on public projects of contractors and other stakeholders who are committed to improving the H&S of their workers and the public. On the same note, clients have an obligation to financially support contractors' H&S programmes, and partake in project H&S activities, and to engage stakeholders who can effectively manage H&S. Moreover public sector procurement provides an opportunity for governments and their agencies to raise the bar for construction H&S. This research provided exploratory evidence based on public sector procurement, and further research can include the private sector and other stakeholders such as contractors, and consultants. In addition, an empirical study can also address the relationships between public procurement and accident trends based on case study projects.

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