Critical Drivers for Health and Safety Management among SMEs in the Eswatini Construction Industry

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Abstract. This paper presents the result of an assessment of the critical drivers for proper implementation of H&S management practices within SMEs in the Eswatini (formerly known as Swaziland) Construction Industry (ECI). The need for a healthier and safer construction environment in the country necessitated the study. A survey approach was adopted for the study and quantitative data were gathered through the use of a questionnaire administered to construction participants within small and medium construction firms in Hhohho and Manzini provinces. Data analysis was done using percentage, and factor analysis, while the reliability of the questionnaire adopted was tested using Cronbach alpha test. Findings revealed that the critical drivers needed for H&S management practices to be effectively carried out among SMEs in the ECI are; creation and implementation of H&S plans, proper workers’ welfare, and government and client’s support. This study adds value to the body of knowledge as it showcases the critical drivers needed for the proper implementation of H&S management practices within the country’s construction industry; an aspect that has not gained considerable research attention within the country

1. Introduction
Having a sustainable built environment has become a topical issue among most academics in recent times. This issue can be viewed from the environment, economic, and social dimensions. However, while more emphasis has been placed on the environment dimension, adequate attention needs to be given to both the economic and social dimensions in order to create a balance [1; 2]. The social dimension encompasses issues surrounding social friendliness of construction projects, as well as health and safety (H&S) issues surrounding the delivery of constructions. Thus, issues surrounding proper H&S practices during the course of delivering a construction project are germane if socially sustainable constructions are to be delivered. Unfortunately, it has been observed that the construction industry globally is one of the most sensitive when it comes to health issues such as accidents and injuries [3; 4]. The industry in underdeveloped and developing countries is performing below standard as a result of their disregards for safety rules and measures which often lead to site accidents, and other negative health issues [5; 6]. Oversight of H&S management practices is a common practice within these industries [7; 8].

Most developing countries are filled with small and medium enterprises (SMEs) which impact greatly on the economic growth of these countries [9]. Although this is the case, these set of enterprises are faced with diverse challenges. In the construction industry, the absence of suitable application of scientific knowledge, presence of statutory requirements hindering growth, inadequate professional knowledge, inadequacy to contain the unusual complications and risks in contracts, poor management
and business control, poor documentation, lack of practical scientific skills, incapacitated contract, and poor resource control characterised these set of firms [10]. SMEs in Eswatini are faced with a similar situation which tends to hinder their growth and subsequently the adoption of proper standards. Therefore, in a bid to deliver projects barring the challenges they face, some crucial aspects such as the adoption of proper H&S management practices tend to be overlooked. Thus, in a developing country like Eswatini where limited research has emanated, understanding the critical drivers to be put in place in order to ensure proper adoption of H&S management practices is crucial. This will ensure that as the construction market grows, the consequent growth of the contractors (small and medium) is coupled with compliance to a set standard and culture. This is important as the malpractice of H&S practices in most cases adversely affects the service delivery of the construction industry as a whole. It is based on this knowledge that this study assessed the critical drivers for proper implementation of H&S management practices within SMEs in the Eswatini Construction Industry (ECI).

2. Drivers of Health and Safety Management Practices

In ensuring proper H&S management practices within SMEs, certain drivers have been identified. Fernandez-Muniz et al. [11] noted the need for preparing H&S plans for every construction project. This planning includes a series of systems put in place to identify risks and provide suitable H&S measures to eliminate accidents and planning of emergency measures in the case of accidents. These systems should be communicated in a manner that can be easily interpreted and understandable by every site worker (educated or uneducated). Also, H&S meetings, regular personal contacts and signposts with H&S rules as awareness to workers can help. In this way, workers would be able to report any H&S issues and suggest ways of improvement [12].

Implementation of H&S Policy is also a critical driver for H&S management. Subramaniam et al. [13] noted that safety promotion policies are “policies that aim to ensure the presence and maintenance of conditions that are necessary to reach and sustain an optimal level of safety.” Safety reporting and recording by construction workers play a vital role in accident prevention on sites and should form a key part of organisations H&S policies. Also, H&S conditions on construction sites need suitable management of work procedures and elementary site supervision. Transparency should exist between management and site managers on what is expected to be done and methods of doing it. Effective supervision should be suitable at required standards in line with the organisation’s goals [14]. By conducting these supervisions on construction sites, it helps the management to view the viability of their H&S strategies and enables amendment where there are discrepancies. By also engaging site workers management can be able to obtain their views on existing gaps and how the H&S plans can be improved [14; 15].

It has also been noted that an SME’s culture should consist of H&S induction programs. The contractor before a construction project start should take their workers for the induction process. The induction process should be based on; the hazards associated with the work performed, the precaution to be taken by the worker to mitigate hazards, and informing of workers of the scope of work [16]. Health and Safety Executive [14] stated that it should be mandatory to brief newcomers on site of all hazards, risky behaviours, site regulations, and welfare facilities and programs. Before the start of any construction phase site, supervisors should address the workers.

According to Muhammed et al. [17], pricing to cover H&S necessities is equally important and should be done at the tender stage. This H&S pricing should cater for planning, and implementing standards which would improve H&S in all phases of the project. Also, the increase in SMEs numbers creates difficulty for the government to implement and control H&S regulations [18]. Wadick [19] identified improper monitoring by the government as a stumbling block for the SMEs who practice good conduct and implement H&S standards in the industry. The practice of “the lowest bidder wins the tender” has compromised the practice of H&S management. The tender sums and expenses for those SMEs who implements these H&S standards are higher than those who take short cuts. This has created a huge perception of lack of confidence and disappointment to the SMEs and drives to attitude disregarding H&S standard. Government and other Stakeholders who partake in construction as project owners should be exemplary in H&S participation [20]. The government can attain this by vigorously
executing H&S directives in practice [18]. Once these regulations have been passed and enforced by government H&S resources and training would be compulsory for the contractor.

According to Hare et al. [21], H&S training is part of safety practice, meaning it plays a pivotal role in the prevention of accidents. Making workers aware of safety regulations and systems, and successfully training them is crucial for a positive H&S culture [13]. To maintain a healthy and safe environment and increased work performance, training for both employees and management is required to acquire the expected level of competence [22]. Agumba et al. [15] further suggested that funds should be budgeted for H&S training for workers. Yung (2009) suggested that construction workers can be sent for H&S seminars or the company can even conduct its own informal seminars.

International Labour Organization [23] also noted that welfare facilities are very important elements to ascertain suitable working conditions. Workers require drinking water, sanitary facilities, restrooms to distress, canteen, dining areas, changing rooms and PPE. These welfare facilities not only contribute to the worker's welfare but also build good relationships. This is said because challenges like sicknesses and injuries could result if workers are ripped off the right for welfare facilities. Studies have further noted that welfare facilities not only help workers’ welfare but also increase productivity [24; 25; 26].

3. Research Methodology

This study adopted a survey approach through the use of a structured questionnaire designed to gather quantitative data from construction participants within SMEs in two (Hhohho and Manzini) out of the four regions of Eswatini. These construction participants include Architects, Builders, Engineers, Quantity surveyors, and General site workers. The use of a questionnaire as the instrument for data collection was based on its ease of usage and ability to cover a wide range of respondents within a short period of time [27]. Ackroyd and Hughes [28] have earlier described the questionnaire as a tool which has the ability to achieve quantifiability and objectiveness in research. Blaxter et al. [29] further affirmed that the questionnaire is among the most widely used social research techniques, hence its adoption in this study.

It is noteworthy to add at this stage that Eswatini stands at a population of approximately 1.4 million people and has a construction industry that is still growing and unstructured [10; 30]. Getting a high number of construction participants as obtained in studies from other developing countries was unlikely. Thus, a total of 71 questionnaires were conveniently distributed with 54 usable questionnaires retrieved and deemed fit for data analyses. The questionnaire was designed in sections with the first section geared towards understanding the nature of the respondents for the study. The second section sought answers regarding the critical drivers for proper H&S management practices within SMEs in the country. A Likert scale of 1 to 5 was employed for section 2. Respondents rated the identified drivers based on their level of significance with 5 being very high, 4 being high, 3 being average, 2 being low and 1 being very low. In analysing the data gathered, firstly the reliability of the research instrument was determined using Cronbach alpha test and an alpha value of 0.875 was derived. This means that the instrument used was reliable since the closer an alpha value gets to 1.0, the more reliable the questionnaire is [31]. Thereafter, the percentage was used to analyse the data gathered on the background information of the respondents, while Factor Analysis was conducted on the data gathered on the drivers for H&S management practices.

4. Results and Discussion

4.1 Background information

The analysis of the background information of the respondents revealed that 72% of the total population were male while the remaining 28% were female. In terms of profession, 15% were Architects, 26% were Builders, 11% were Engineers, 22% were Quantity surveyors, and 26% were General site workers. For their academic qualification, the result revealed that 46% of the respondents have an Ordinary National Diploma, 20% have a Higher National Diploma, 28% have a Bachelor’s degree, 4% have a Master’s degree and 2% have a Ph.D. Also, 30% of the respondents have between 1 to 5 years of working experience within the construction industry, while 70% have above 5 years of working experience. On the overall, an average of 8.7 years was derived for all the population of the study. This result implies
that the respondents for the study are well equipped both academically and in terms of years of experience within the industry to give significant answers to the questions of the research.

4.2 Drivers of Health and Safety management practices among SMEs

From the review of the literature, 13 drivers the Implementation of H&S management practices were identified and presented to the respondents to rate according to their level of significance. Considering the fact that there is the likelihood of some of the identified drivers having similar underlying effects, factor analysis (FA) was deemed necessary to reduce these drivers into a smaller number of coherent subscales. To conduct FA, the suitability of the sample size was considered. Although there have been several disparities as regards the ideal size of a sample for FA to be conducted. Preacher and MacCallum [32] suggested an evaluation of the communalities and the expected number of factors to be extracted. It was stated that if the communalities of the assessed variables are high (above 0.6), and the expected number of factors to be extracted is small, fewer worries should be placed on the sample size [33]. The result from the communalities analysis revealed that all the assessed drivers have communalities figure above 0.6. Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were also used to ascertain the suitability of the data for FA. The result of the KMO test gave a value of 0.743 and a significant level of 0.000 for Bartlett’s test (see Table 1). According to Tabachnick and Fidell [34], KMO gives a value ranging from 0 to 1. However, a value of 0.6 and above is considered a good fit for FA. Pallant [35] also suggested that for FA to be conducted Bartlett’s test of sphericity should be significant (p<0.05). Thus, the result of the KMO and Bartlett’s test derived, coupled with the communalities values and the 0.875 value obtained from the reliability test conducted, proves that the use of FA for the data gathered is appropriate.

Table 1: KMO and Bartlett's Test for the drivers for H&S management practices among SMEs

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | 0.743 |
| Bartlett’s Test of Sphericity | Approx. Chi-Square 389.677 |
| df | 91 |
| Sig. | 0.000 |

After meeting the necessary requirement, FA was conducted using principal component analysis (PCA) with varimax rotation. Result revealed the extraction of 3 components with eigenvalues greater than 1. The percentage for each of the components extracted includes 41.7% for component 1, component 2 with 11.1% and component 3 with 9.7%. The final statistics of the PCA and the components extracted accounted for 62.6% of the total cumulative variance, which is well above the 50% limit stated by Stern [36]. Pallant [35] further suggested a look at the scree plot in order to determine which components (factors) to retain. In doing this, an elbow in the shape of the plot is identified, and only components above this point are retained. Looking at figure 1, a change can be observed from the third component, thus, confirming the retaining if the 3 extracted components. These 3 components and the variables loading on them (with only factor loading ≥ 0.5) are shown in Table 2.
4.3 Discussion of Extracted Factors

A. Creating and Implementing H&S Plans

The first principal component has the highest factor loading of 5 drivers and it accounts for 41.7\% of the total variance explained. This percentage is way higher than the percentage for the remaining two extracted factors, thus implying that drivers loading on this component are critical if effective H&S management is to be practiced within SMEs in the Eswatini construction industry. These drivers include; preparing H&S plans for every construction project, amending and correcting H&S plan throughout construction, implementing site H&S rules and measures, pricing to cover H&S requirements for projects, and carrying out periodic site inspection for safety. Based on the latent properties of these variables, this component was named the “Creating and Implementing H&S Plans”.

The creation of H&S plans within SMEs in the construction industry in Eswatini cannot be overemphasised. These plans should include the method of identifying and eliminating accident risks, as well as putting in place emergency means of attending to incidence when they occur as observed by Fernandez-Muniz et al. [11]. These plans must also be implemented and supported by top management within the organisation. Through this support, proper monitoring of H&S practices within the organisation can be encouraged and amending of H&S plan put in place can be done as noted by Agumba et al. [15]. This implies that continuous evaluations of the performance of the H&S plans put in place is crucial, and this can be achieved through periodic inspection of site wherein work are being conducted.

Aside from creating, implementing and evaluating H&S plans, the adequate budget must be allowed for H&S while tendering for a job. Although, Loosemore et al. [37] have earlier argued that there is no competitive advantage for contractors who have good H&S record. In fact, Smallwood [38] stressed that contractors in most cases tend to lose tenders to their counterpart who careless about including H&S measures in their bids. This is not a good practice if healthy and safe construction environment is to be achieved. SMEs, therefore, have to find a way of assigning a budget for H&S into their tender price [17]. As noted by Smallwood et al. [39] making a second- or third-party certification in terms of H&S certification will go a long way in ensuring SME contractors tender for H&S and inculcate same in their everyday activity.
B. **Proper Workers Welfare**

The second principal component has 6 drivers loading on it and accounts for 11.2% of the total variance explained. These drivers are the provision of sanitation and welfare facilities for workers, proper evaluation of construction workers migrating from other countries into Eswatini, site inductions for workers, H&S seminars for workers, training programs for workers, and rewarding workers for safe work behaviours. These factors were subsequently named “proper workers welfare”. Findings of this study further corroborate past submissions that there is the need for proper workers welfare through the provision of required facilities as this goes a long way towards improving the productivity of workers [24; 25; 26]. Showing workers that their welfare is important right from the beginning of the job through proper induction is important. Aside induction, training on H&S practices as the job unfolds is equally crucial for a positive H&S culture within the industry as a whole [13]. In a similar vein, proper evaluation of construction workers migrating from other countries into Eswatini is important as these foreigners come around with different orientation when it comes to H&S issues. Properly examining and training these workers to conform to the H&S plans of the organisation can go a long way in ensuring a healthy and safe construction environment.

C. **Government and Client’s Support**

The last principal component has 2 drivers loading on it and accounts for 9.7% of the total variance explained. These variables are Government support through creating of H&S regulations and enforcing them, and clients support through the request of H&S measures on their project, and it is subsequently named “Government and Client’s Support”. Government involvement has always been identified as a major yardstick that can help the adoption of practices within diverse industries. Thus, if H&S practices are to be fully implemented by SMEs in the construction industry in Eswatini, the Government must be willing to champion this course through enforcement of H&S regulations. This can be done through the creation of stringent requirements on H&S right from the tendering stage of projects [39]. This is necessary in order to avoid contractors not pricing for H&S while tendering as the lowest bidder wins the tender in most cases [19]. This submission is in line with Votano and Sunindijo [20]’s submission that the Government and other Stakeholders who partake in construction as project owners should be exemplary in H&S participation.

| Table 2: Rotated Component Matrix for the drivers for H&S management practices among SMEs |
|-----------------------------------------------|---------------|
| Component                                      | 1             | 2             | 3             |
| Preparing H&S plans for every construction project | 0.812         |               |               |
| Amending and correcting H&S plan throughout construction | 0.784         |               |               |
| Implementing site H&S rules and measures       | 0.761         |               |               |
| Pricing to cover H&S requirements for projects | 0.620         |               |               |
| Carrying out site inspection for safety periodically | 0.516         |               |               |
| Provision of sanitation and welfare facilities for workers | 0.785         |               |               |
| Proper evaluation of construction workers and contractors | 0.785         |               |               |
| Site inductions for workers                    | 0.707         |               |               |
| H&S seminars for workers                       | 0.679         |               |               |
| Training programs for workers                  | 0.649         |               |               |
| Rewarding workers for safe work behaviours     | 0.593         |               |               |
| Government support through creating of H&S regulations and enforcing them | 0.870         |               |               |
| Clients support through the request of H&S measures on their project | 0.717         |               |               |

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
5. Conclusion and Recommendations

This study set out to assess the critical drivers for effective H&S management among SMEs in the ECI. Based on the findings, the study concludes that if H&S management practices among these SMEs is to improve, drivers such as the creation and implementation of H&S plans among SMEs, proper workers welfare, and government and client’s support must be put in place. H&S plans must be made for each construction project being handled, and these plans must be evaluated and amended as the job unfolds. Adequate allowance must be made for the cost of implementing H&S practices on every project as this also caters for the provision of sanitation and welfare facilities for workers on site. In a similar vein, with Eswatini being a developing country with migrants coming in to seek greener pastures, proper evaluation of construction workers migrating from other countries must be done. Aside from evaluation, site inductions, and training programs should be conducted for these workers in order to orientate them with regards to the need to maintain a safe and healthy working environment. Lastly, government support through the enforcement of H&S management practices on every project and client’s request of H&S measures on their project can also go a long way in improving the H&S management practices of small and medium contractors in Eswatini.

This study contributes the body of knowledge as it brings to light some of the critical drivers that need to be in place to ensure proper H&S management practices within SMEs in ECI; an aspect that has not gained considerable attention within the country. Although this study contributes immensely to the body of knowledge on H&S practices in Eswatini, its limitation lies in the gathering of data from 2 out of the 4 regions of the country. Further study can be conducted within the other 2 regions in order to compare the result. Also, the extracted drivers for H&S management accounts for only 63% of the total drivers needed to improve H&S management practices in the country. This implies that there is the possibility of some other underlying variables that can help improve this situation, that is not captured within this current study. Hence, further study can be conducted through a qualitative approach by using interview to get first-hand information from construction participants within SMEs in the country.

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