

The Effect of Workplace Audit and Health Safety Inspection on Employee Productivity among the Mining Firms in Rwanda

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Abstract: *The objective of the study was to establish the effect of workplace audit and inspection on the employee productivity in Wolfram, Rwanda. The research adopted descriptive and correlative research design. Simple random sampling technique was applied to obtain 92 respondents from the employees of Wolfram mining firm in Rwanda. Questionnaires and interviews were used to collect primary data. The data was analyzed using SPSS for descriptive statistics to test the employee productivity and regression analysis was used to determine the nature and magnitude of the effect of the study's independent variable on the study's dependent variable which were OHS audit and inspection; and the employee productivity respectively. Analysis of Variance (ANOVA) test was used to determine the significance of the correlation between the study variables. Findings of the study revealed that there are effective OHS audit and inspection in WMP Ltd which positively affect the employee productivity. Indeed, 90.7% of the respondents strongly agreed that company management advises employees on the health and safety. In addition, the ANOVA test; a p-value was found to be (0.001) which is far less than alpha of (0.05) that is significance level. The research, therefore, concluded that there is a correlation between occupation health and safety; and employee productivity in Rwanda. On the basis of the findings, the study recommends that mining and processing firms in Rwanda develop strategies that include regular audit and health inspection on the employees as it will help revealing and handling any health issues before they can affect the employee's productivity negatively. Policy makers too are also called upon to sensitize the general public as regards to OHS audit and inspection and it's significant especially in the mining and processing sector.*

Keywords: Work place audit and inspection, productivity, mining firms, Rwanda

1. Background of the Study

In spite of the fact that occupational health and safety (OHS) audit and inspection procedures have been relied upon for many years, the formal practice of audit and inspection of the OHS has been in existence for a relatively short period. In addition, emphasis has historically been placed on a periodic, backward-looking approach whereby key events and activities are often identified long after their occurrence. As regards to the recent technological advancement that are known to have facilitated a movement away from the historical paradigm and toward a more proactive approach, it is essential that auditors understand what the future OHS audit and inspection entails and how they might begin to envision a logical progression to such a state. To enhance this comprehension, it is advisable to consider how OHS audit and inspection evolved from its formal beginnings in the early twentieth century (Blom, 2014).

In the United States of America, occupational health and safety audit must be performed by an audit team, which has to be formed by one or more individuals having specific competencies, abilities and experience in activities, audit criteria and audit techniques. The team may include a lead auditor, auditors, and technical experts. In any case, there is an only single universal specification that comprises of the requirements regarding the role, competencies and evaluation of OHS auditors and inspectors for quality and workplace safety. This standard is applied all over the world only that some guidelines regarding documentation of the audit or developing an audit in a particular industry have been issued in some countries (Barnes, 2012).

It is on record that most of the historic documentation indicate that OHS audit and inspection in most European Union countries has served as a simple administrative procedure comprised mainly of checking employee health, auditing possible hazards, and reporting to Board of Directors or Management for sustainable or preventive solutions. In recent times, however, a combination of different forces has led to a quiet revolution of the professional OHS audit and inspection. Technological advancement makes it possible to track and analyze working environment with continually increasing speed thus making it essential for organizations to be well advised by the OHS related department (Ramamoorti, 2012).

In China and India, workplaces are faced with the challenge of providing a healthy and safe environment for their employees across the globe. This means that employers must pay attention to the problems that substance abusers bring into the workplace, and that interfere with their effective functioning and the general wellbeing of their colleagues as well as impacting on business productivity. Employers must also be aware of the conditions within the workplace that may predispose workers to use or abuse drugs. While there is not a great deal of research that has been done about the impact of substance abuse in the workplace, there are costs involved in the impact and the states, territories and the Commonwealth government have responsibilities collectively in this area (Fa et al, 2015).

The Australian Coal Association, which has collected 'the only high productivity, industry wide Australian data', highlighted the fact that there is proven link between the presence of a hazard-free environment and productivity, most importantly, that post accident the presence of a hazards should be assumed to be the root cause of the high

productivity without significant further evaluation. Fatigue, shift design and rostering may all contribute as well. Despite the difficulties of establishing relationships, some objective evidence exists of the link between fatalities and drug use and estimates of impacts have been made. The most comprehensive, the study of work-related fatalities, which was undertaken by the National Occupational Health and Safety Commission (NOHSC), examined coroners' reports for a large number of workplace deaths between 2001 and 2005 (Laurence, 2012).

In a study done in North Africa, it was noted that the competence of the auditor is essential in performing a good OHs audit and in obtaining correct results for an audit and inspection. An auditor having a solid background in general auditing techniques and requirements of the OSH standard, but only superficial knowledge of the OSH regulations, procedures and standards (specific legislation or good practices, hazards, risk assessment procedures, characteristics or requirements for personal protective equipment) would be able to only assess the formal accomplishment of the requirements and could fail to reveal major non-conformities of the organization in adopting adequate measures for preventing accidents or occupational diseases and for protecting the health of the employees (Durand, 2012).

Occupational health and safety audit in Tanzanian, any organization is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety audit and inspection programs is to foster a safe work environment. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment. It may involve interactions among many subject areas, including occupational (or industrial) hygiene, public health, safety engineering, health physics, environmental health, industrial relations, public policy, industrial sociology, occupational diseases, social law, labor law and occupational health psychology (Rauch, 2013).

Ministry of Labor-MIFOTRA (2017), in accordance with the Labor Code, an employer is responsible to maintain health and safety of the workers at workplace. Employer is required to keep the workplace in a common state of cleanliness and presentation of hygiene & safety necessary for the health and safety of workers. Employer is required to: provide workers with work premises and tools appropriate for the work; assure workers of the reliable and timely renewal of collective and individual means of protection; conduct a risk and hazard analysis and take effective protective measures; inform employees about any risks likely to result from the use of technologies and any other imminent danger; ensure that safety information is displayed in readable language in all premises; make no deductions from an employee's remuneration or charge an employee in respect of anything done or provided in pursuance of the order on OHS; and notify the labor inspectors of any dangerous occurrence or occupational accident within four days of such incident.

Wolfram Mining Processing (WMP) Ltd which is among other mining and processing companies in Rwanda which started working on 22nd Dec 2006 with 300 employees, the company continued growing since then and now has more than 3000 employees and uses modern machines for the production treatment. It operates in two districts, Kayonza and Burera with administration offices stationed in Kiyovu, Kigali city. According to Rwanda Mines, Petroleum and Oil Board-RMB (2019), mining companies have been faced by numerous accidents which have claimed their staff lives.

It's for this reason the researcher was interested in carrying out a study to analyse the effect of OHS audit and inspection on employee productivity of mining and processing firms in Rwanda.

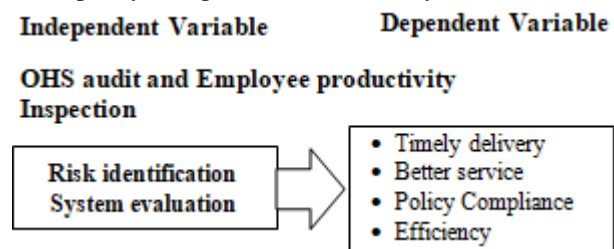
2. Statement of the Problem

Most mining and processing firms in Rwanda have functional occupational health and safety (OHS) audit and inspection departments with well qualified staff, charged with responsibility of providing management with re-assurance that internal control systems of OHS are adequate and quality of services in place (MIFOTRA, 2017). However, fatal accidents are on the rise within the mining firms in Rwanda. For instance WMP Ltd in Kayonza and Burera lost eleven staff despite the audit's report of 2016 that recommended the management to increase the number employee trainings on the OHS (WMP (2019). Consequently, many employees perceive the sector as risky leading to dissatisfaction and poor service delivery (RMB, 2019).

3. Conceptual Framework

According to Haylas and Ashton (2012), a conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Likewise, conceptual frameworks are abstract representations, connected to the research project's goal that directs the collection and analysis of data. Conceptual framework is a theoretical structure of assumptions, principles and rules that hold together the ideas comprising abroad concept.

Thus, the below framework breaks down the variables of OHS audit and inspection and employee productivity into their respective sub variables. The independent sub variables include risk identification and system evaluation while dependent sub variables include: timely delivery, better service, policy compliance and efficiency.



4. Literature Review

Workplace audit and inspections of OHS are designed to ensure that appropriate smooth running of the company and the increase of employee productivity should be in place to ensure OHS system is functioning as designed. Work place audits and inspections can have features built into them to ensure that fraudulent transactions are flagged or made difficult, if not impossible, to transact. Workplace audits provide assurance that controls are working, but they do not necessarily detect fraud or corruption. Internal controls audit objectives relate to management's plans, methods, and procedures used to meet the organization's mission, goals, and objectives. Internal control includes planning, organizing, directing, and controlling program operations and the systems put in place to measure, report, and monitor program performance (Haylas and Ashton, 2012).

Detecting health and safety challenges is a quiet challenging task for the management. The company safety auditors should therefore actively engage everybody in a company in an attempt to reveal each and every staff behavior. OHS auditors should have limited experience in fraud detection, and insecure activities are inherently unpredictable and difficult to detect. Hence, the organization would be optimally served by identifying and utilizing those activities which, because they appear to share certain unique traits or characteristics, may be best suited to the insecurity detection task (Norman et al., 2010).

According to Haylas and Ashton (2010) management should ensure that procedures are implemented by making supervisor accountable for health and safety performance in their areas and by providing them with help, guidance and training they may need to carry out their responsibilities effectively. The membership of such committee must be drawn across the organization to review practices and conditions and make suggestion to improve health and safety performance. Due to the importance of effective fraud detection, any measures that can enhance the efficacy of auditors should be of value. While experience and ability are undeniably important in the detection process, certain individual characteristics may be predictive of the capacity to detect fraud.

Ramamoorti (2012), in their effort to provide evidence on the effectiveness of particular audit techniques in detecting accidents and incidents that affect the employee productivity suggested that all intentional errors are concentrated in relatively few audits and these are fairly predictable by industry. The great majority of such errors affect income but the direction of effect may either be an understatement or over statement. Regarding the signaling of an error, they found that the large portion of human errors are initially signaled by less rigorous audit procedures such as analytical review and discussions with the client. Client personnel problems such as inexperience, incompetence and insufficient knowledge and inadequate control follow up or reviews were found instrumental in causing the errors.

5. Methodology

This study applied both descriptive and correlative research designs using a case study of *Wolfram Mining firm in Rwanda*. Rowley (2012) indicates that a case study research is good for contemporary events when the relevant behavior cannot be manipulated. The study focused on 1,148 employees of the WMP Ltd composed by 1,132 miners and 16 administrative staff of WMP Ltd. Solvin's formula was used to determine the sample size has shown below.

$$n = \frac{N}{1 + Ne^2}$$

Whereby;

n = the desired sample size

e = probability of error (i.e., the desired precision, e.g., 0.1 for 90% confidence level)

N= population size of the study

Therefore: N=1,148; e=0.1

$$n = \frac{1148}{1 + 1148 \times (0.01)} = \frac{1148}{12.48} = 91.98 \approx 92 \text{ respondents}$$

Closed ended questionnaire was used to obtain primary data and review of reports for secondary data. The data was analyzed using SPSS for descriptive statistics to test for employee productivity and regression analysis was used to determine the nature and magnitude of the effect of the study's independent variable on the study's dependent variables that OHS audit and inspection against employee productivity. Analysis of Variance (ANOVA) test was used to determine the significance of the correlation between the study variables

6. Results and Findings

Table 1 presents results in relation to the model summary. Findings revealed in the table show that 78.7% changes in employee productivity could be accounted on workplace audit and inspection. Thus, a strong positive impact between the study variables marked by R=.873_a as asserted in the model summary table

The model summary designated that an adjusted R squared is coefficient that governs the disparity in the reliant variable because of the variations in the liberated variable. As revealed in the table, the value of adjusted R squared was 0.787. This implies that, 78.7% of the variations in employee productivity could be explained by changes on employee trainings, protection at workplace and workplace audit and inspection.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873 _a	.787	.6102	.13301

a. Predictor: (Constant), Workplace audit and inspection

As revealed in the ANOVA test, presented in table 2; a p-value of 0.001 less than alpha (5%), the significance positive impact level. In addition, the results clarify that the given data perfect well with the multiple regression models. Therefore, the significance value was less than 0.05, an indication that the model was statistically significant.

Table 2: Analysis of Variance (ANOVA)

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	.991	5	.248	7.132	.001 ^b
	Residual	.369	81	.023		
	Total	1.360	86			
a. Dependent Variable: Employee Productivity						
b. Predictors: (Constant), Workplace audit and inspection.						

Study findings presented in table 3, the established regression equation was:

$$Y = \beta_0 + \beta_3 X_3 + e$$

$$Y = 1.944 + 0.791 (\text{Workplace audit and inspection}).$$

Based on regression equation presented in table 3, it was revealed that holding workplace audit and inspection to a constant zero, employee productivity would be 0.791. This also refers to a unit increase in workplace audit and inspection would lead to increase of employee productivity by 79.1%. As revealed in the table, of course, this constant called y-intercept is not realistic but it is a needed parameter in the model. In addition to the findings, since earlier the study also found that all the p-values were less than alpha (0.05) and this is a confirmation that all the variables were statistically significant in influencing employee productivity in WMP Ltd

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.944	.878		.345	.774
	Workplace audit and inspection	.791	.257	.354	1.336	.123
a. Dependent Variable: Employee Productivity						

7. Discussion of Findings

Based on the findings reached after the primary and secondary data, all objective was achieved as indicated. The findings of the current study are in agreement with results of previous studies in Europe by Faye et al (2014) who posited that OHS auditor analysis is one of the foundations for enabling improvement in OSH system. Results added that sound basic education for certified induction and refresher training, and certified company specific training as part of lifelong learning, are crucial for the implementation of effective health and safety hazard prevention programs. These must be supplemented by specific seminars and refresher training and improvement programs for trainers and for manager's supervisors and workers.

In addition, the study was supported by a research done by Putzel et al (2011) which concluded that OHS audit and inspection in the mining companies have a positive effect on the productivity of the people employed by these companies compared to other sectors since this sector involves a long chain of risks while on work. Balmford et al. (2012) argued that without OHS audit and inspection, most Canadian mining and processing companies would cease to exist. It was understood that settlement and development in Canada are inextricably linked to the discovery and exploitation of natural following the development of strong OHS audit and inspection.

8. Conclusion and Recommendation

The study concluded asserting that OHS audit and inspection are effectively supported by WMP Ltd, Gifure Site through ensuring independence of the auditors and inspectors in the company. Besides, employee productivity of WMP Ltd, Gifure Site was discovered to be high which according to the study participants, this was chiefly because of having the ensured effective OHS audit and inspection.

Finally, a p-value (0.001) as discovered in ANOVA test was less than the consequence level (0.05) which in other words alpha, we therefore came to an inference that OHS audit and inspection was significantly related to the employee productivity of WMP Ltd, Gifure Site. Hence, a positive effect between occupational health and safety (OHS) audit and inspection on the employee productivity in Rwanda mining sector.

Based on the study findings, the research recommended that mining firms in Rwanda should adhere to OHS auditors and inspectors recommendations. Further, the study recommends for development of sensitization programs amongst workers of mining firms on OHS in Rwanda to reduce uncertainty and fear which negates the employee's productivity.

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