

The Study of Occupational Health and Safety at the Small Engineering Industries in MBEYA City, Tanzania

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Abstract: The Small Engineering Industries are the most hazardous industries due to their unique nature, and their industrial safety records in Tanzania are very poor. This study aimed to examine the status of occupational health and safety management of the small scale engineering industries in Tanzania but with special attention to Mbeya city. To examine causes of frequent occurrence of accidents, identify types of hazards faced by workers and finally explore on how safety rules and policies are being implemented in the industrial level. A total of 104 Small Engineering Industries were studied. Qualitative and Quantitative approaches were used as research methodologies that included interviews to employees and distribution of questionnaires. The findings revealed that the behavior of small engineering industries on occupational health and safety management are of grave concern, including the lack of provision of personal protective equipment and safety training. The main factors affecting occupational health and safety performance included poor safety awareness. The study proposed that the OSHA should play a vital role in legal enforcement and organizing safety training program.

Keywords: Occupational Health and Safety, Small Engineering Industries, Hazards, Causes.

1. INTRODUCTION

The Small Engineering Industries (SEI) is the sector of economic that transforms various resources into physical, economic and social infrastructure necessary for socioeconomic development. The continuous growth of the SEI has led to an increase of accidents which mostly go to undetected and therefore unreported. This situation affects Tanzania in some ways, and therefore demanding this study to undertaken. Occupational Health and Safety Management involves an element of planning, identifying problem areas, coordinating, controlling and directing the safety activities at work sites, all aimed at prevention of accidents and ill health. SEI is the second most hazardous after mining and its hazardous nature necessitated the importance of taking Occupational Health and Safety seriously (Confederation of Tanzania Industries, 2012).

Adherence to safety and health in SEI is not only important for compliance reason, but is a moral responsibility of the industrial manager in ensuring the wellbeing in the working place. It also gives an industrial manager an opportunity to maximize profit on business. Ignoring occupational safety and health can result to accidents and diseases causing inefficiency hence lowering productivity and therefore loss of profit [2]

SEIs are widely regarded as an accident prone industry [7]. The reasons why SEIs are risky and prone to occupational health and safety risk is because of the physical environment of the work, nature of the industries workplace, methods used in industrial, materials used, heavy equipment used, and physical properties of the industrial in itself negligence of health and safety rules and regulation (Menzel, et al, 2010). There are statutory instruments and legislative frameworks in many developed countries to govern SEI and help in minimizing occupational health and safety hazards. However, the characteristics of SEIs in developing countries are not the same, (Jaselskis, 1998). Hence, occupational Health and Safety policies and procedures may vary and needs to be contextualized.

In Tanzania the injury rates in SEIs are all greater than 30 injuries per 1000 workers. The expansion of chemical, electronic and biotechnology industries services has introduced new risks, widened the spread of work –related risks and increased their interaction with non-work factors in ill health, such as environment pollution (Confederation of Tanzania Industries, 2012).

SEIs are the relatively hazardous undertaking and their continuous growth of SEIs has led to an increase of accidents which mostly go undetected and therefore unreported in different engineering industrial place. There are significantly more injuries and lost workdays due to injuries in small engine industry than in virtually any other industry [4]. These work related injuries are exceedingly costly. Efforts made to create awareness on the importance of adhering to occupational safety and health on SEI has been successful, still many people in Tanzania suffer injuries because of bad and often illegal working conditions in industrial place (The Occupational Safety and Health Act 2003). Based on the fact that the major economic activities in Small Scale Industrial Production is increasing (Mbeya City investment profile, 2010), therefore it is the intention of this study to continue studying and assessing the progress of Occupational Health and Safety Management in Small Engineering Industrial in the City of Mbeya.

2. MATERIAL AND METHOD

The study included both the Qualitative and Quantitative approaches aimed at discovering the underlying motives and desires, using in depth interviews for the purpose of identifying the Industrial accidents. The area of the study was Mbeya city, and was chosen as the area of the study due to the fact that the continuous growth of the SEIs has led to an increase of accidents which mostly go undetected and therefore unreported.

The first step was to find out background information about worker behavior in the industrial place. A questionnaire was designed and issued to industrial workers for assessing occupational health and safety management at industrial places. The content of the questionnaire consisted of 5 parts. The first part was on the personal particulars, while other parts concentrated on the Identification of hazards faced by workers at industrial place, frequency of accident happened with workers, also the questionnaires was to explore how safety rules and policies are being implemented by employers, recommendations on safety measure to be taken. The targeted groups in this research were industrial supervisors and their employees. The selection of industrial supervisors was based on that are the one whereby the issue of safety is responsible to them, and laborers are the one of the major victims with the issue of safety. There were a pre-determined number of industrial supervisors and employees to be interviewed in each selected industrial place around Mbeya City making sample size of 104 drawn from a total of 81 employees constituting 78.7% and 19 industrial supervisors from 23 supervisors, constituting 82.6%. Both numbers of responds constitute statistical analysis to be taken.

2.1. Research Results and Discussion:

The researcher collected a total number of 104 respondents. Table 1 and 2 show a statistics data and area of business where the research conducted.

2.1.1. Study areas of Small Engineering Industries in the City of Mbeya:

Findings in Table 1, below shows the number of respondents attended in the study.

Table 1: SEIs in the city of Mbeya

		Frequency	%	Valid %	Cumulative %
Valid	Mbalizi	18	17.3	17.3	17.3
	Uyole	18	17.3	17.3	34.6
	City centre	9	8.7	8.7	43.3
	Mabatini	9	8.7	8.7	51.9
	Nzovye	16	15.4	15.4	67.3
	Iyunga	14	13.5	13.5	80.8
	Soweto	20	19.2	19.2	100.0
	Total	104	100.0	100.0	

Source: (Field research 2014)

The distribution of respondents by industries is presented in Table 1 where it shows that 20 (19.2%) respondents were coming from Soweto. Based on the observation point of view, Soweto is busiest place in the city. Many business activities are conducted there. Businessmen and women from the Mbeya Region and other neighboring countries, such as Zambia, Malawi, Democratic Republic of Congo (DRC) gather there for wholesaler and Retailer business that why many engineering activities are performed.

2.1.2. Respondents by Gender:

The first characteristic of the respondents to be explained here was the gender of respondents. In this research a large section of the respondents was randomly picked. The researcher happened to interview both employees and employer. In this research two categories of gender participated by contributing their ideas, in this study happened to score 84 (80.8 %) for male respondents and 20 (19.2 %) for female respondents, Table 2

Table 2: Show Gender distribution of Respondents

	Frequency	%	Valid %	Cumulative %
Valid Female	20	19.2	19.2	19.2
Male	84	80.8	80.8	100.0
Total	104	100.0	100.0	

Source: (Field research, 2014)

According to these results, males dominated production in the industries than females. The results in Table 2 above imply that, there was no gender balance to those respondents who participated in this study. Though most technologies are considered gender neutral, they are often considered gender biased during their introduction and use by societies. So change of people’s perception is considered vital; as the Government of Tanzania in increasing efforts of female enrolment of Engineering studies, i.e. introduction to Access courses to Engineering Institutes in Tanzania.

2.1.3. Respondents by Age:

This study was conducted among those employees in industries who demonstrated their age to be either 18 years old and above. Consequently, the age of respondents happened to fall into one of these interval categories and their percentages: Table 3 depicts the respondents’ age categories. From the Table 3, it shows that 54 (51.9%) respondents were aged between 22 and 35 years, had a lot of experiences in industrial work and accidents.

Table 3: Show the distribution of respondents by age group

	Frequency	%	Valid %	Cumulative %
Valid 18-21	26	25.0	25.0	25.0
22-35	54	51.9	51.9	76.9
36-50	21	20.2	20.2	97.1
51-70	3	2.9	2.9	100.0
Total	104	100.0	100.0	

Source: (Field research, 2014)

2.1.4. Respondents by Marital status

The other characteristic of the respondents to be explained here is the marital status of the respondents. In this research a large section of the respondents was randomly picked. The researcher happened to interview both married and those who are single. In this research two categories of marital status that participated by contributing their ideas in this study happened to score 43 (41.3 %) for married respondents, Table 4.

Table 4: Show the marital status of the respondents

		Frequency	%	Valid %	Cumulative %
Valid	Married	43	41.3	41.3	41.3
	Single	61	58.7	58.7	100.0
	Total	104	100.0	100.0	

Source: (Field Finding, 2014)

Results in Table 4 show that the largest respondents were single and youth. Based on researcher's observation, SEIs was so demanding of energy and higher degree of flexibility based on customers, youths are better than olds.

2.1.5. Level of Education of Respondents:

Though a large section of the respondents was randomly picked, safety knowledge was very important aspects in determining the response or reaction of the respondents towards safety matters in this study. Respondents were also requested to mention their level of education which is very important. Results in Table 5 present the education level of respondents whereby 53 (51.0%) respondents had secondary education. Secondary school leavers consist of more elite people knowledgeable to work in SEIs.

Table 5: Level of education of the respondents

		Frequency	%	Valid %	Cumulative %
Valid	Adult education	17	16.3	16.3	16.3
	Standard seven	15	14.4	14.4	30.8
	Form four	53	51.0	51.0	81.7
	College and above	6	5.8	5.8	87.5
	Post-secondary education	1	1.0	1.0	88.5
	Not attended to school	12	11.5	11.5	100.0
	Total	104	100.0	100.0	

Source: (Field finding, 2014)

2.1.6. Findings on the types of Hazards facing workers at Industrial place:

It is generally accepted that different places have different causes of accidents, this due to different activities, demanding skills, awareness and hazard likelihood. Therefore the research findings indicated that there were 6 different types of Hazards affecting Small Engineering Industries in the City of Mbeya, see figure 1.

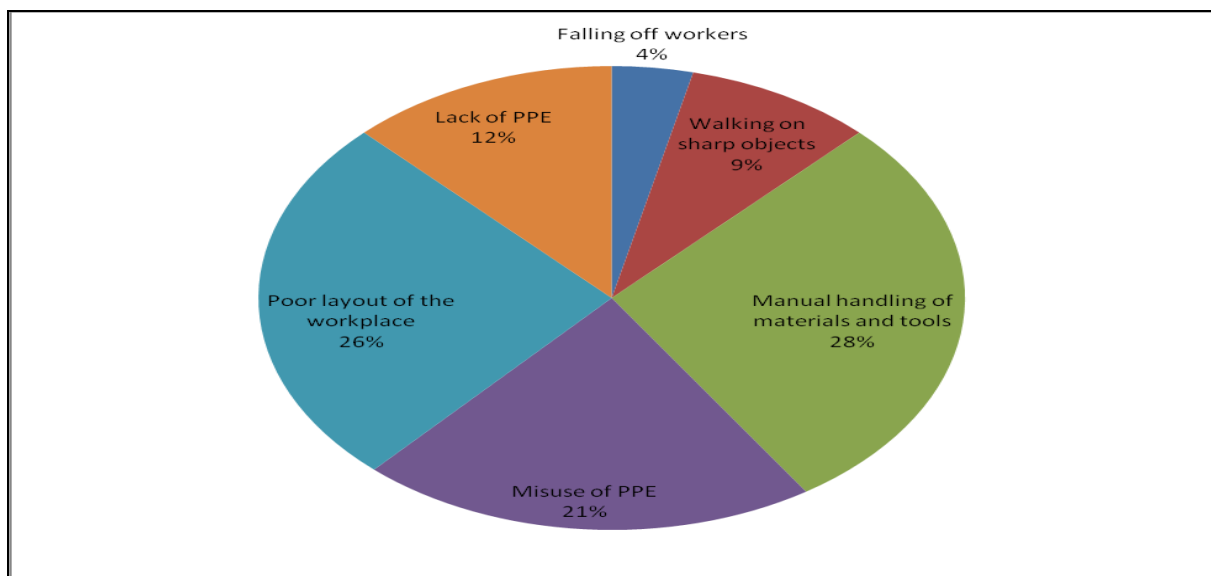


Figure 1: Types of Hazards Facing Workers at Industrial Place

The study show that the most types of hazards facing workers at industrial places manual handling of materials and tools 23 (28.4%). Discussing with workers on the causes of accidents; research finding indicated to lack of knowledge on how to use handle tools, which were associated with workers ignorance while working in work places. These results are so subjective, in the sense that type of hazard likely to cause accidents is so dependent on the area, knowledge; type of industry etc, thus suggesting that improvement of knowledge in SEIs on Safety measures should be considered.

Also the results in figure 2 show that the types of hazards facing worker at industrial place, (36%) of accidents are caused by lack of supervision of workers while at work particularly on industries with machinery/tools. Lack of safety knowledge could have contributed to higher accident rate, because of (51%) were form four leavers (Table 5) which according to their syllabus do not cover industrial safety measurements.

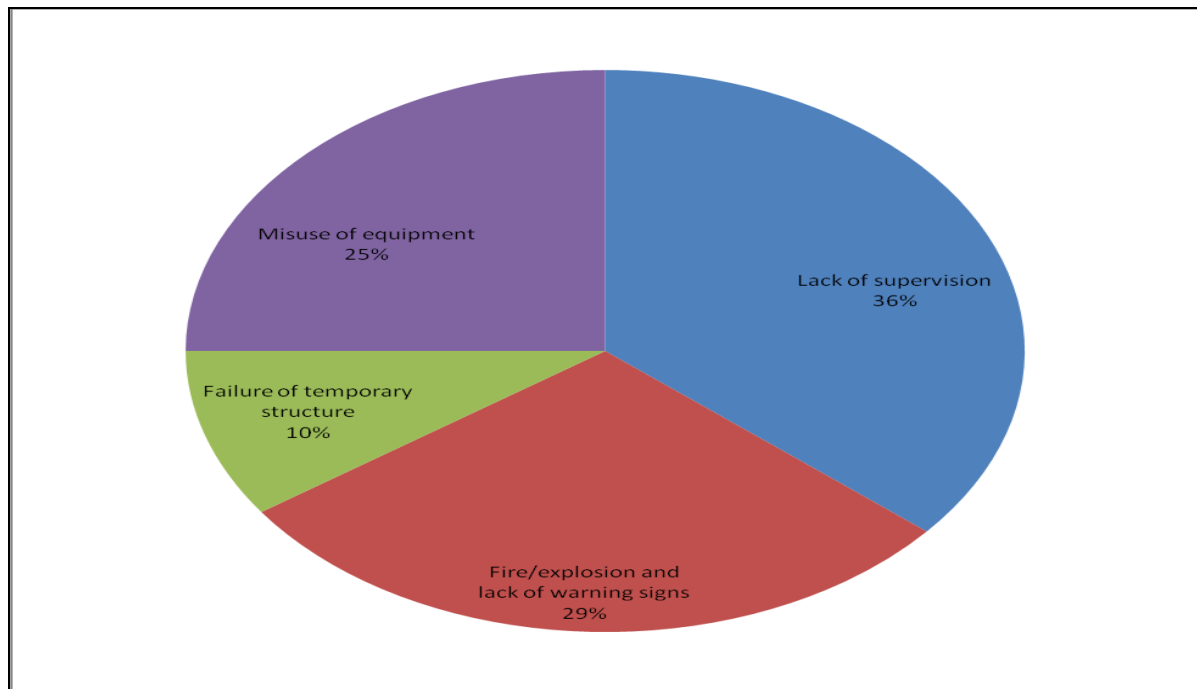


Figure 2: Types hazard causing accidents at workplace. Sources: (Field work, 2014)

Table 6: Findings on how safety rules and policies are being implemented in the industrial

		YES	NO
How safety rules and policies are being implemented in the industrial	Practice OHS Principle	87.5	12.5
	Trained On OHS	44.4	55.6
	Occurrence of Accidents in The Industries	34.7	65.3
	First Aid in the Respondents Industries	61.1	38.9
Protective gears	Safety Helmets	46.9	53.1
	Safety Footwear	84.0	16.0
	Eye Protection	70.4	29.6
	Respiratory Protection	61.7	38.3
	Outerwear /Overall	84.0	16.0
	Hearing Protection to Respondents	49.4	50.6
	Hand Gloves to the Respondents	75.3	24.7

Source: (Field work, 2014)

Research finding as indicated in Table 6 shows that 87.5% of Small Engineering Industries do Practice OHS Principle, however only 44.4% were trained on OHS. This result appears to contradict each other, because the higher the training it could have led to higher Practice OHS Principle, which in this case contradicts. In addition to that the Occurrence of Accidents in The Industries were recorded as low as 34.7% on the other hand enquiring First Aid practice in Industries results show that 61.1% have done it. Based on results in Table 6, it can generally be said that safety rules and policies are well being implemented in the industries in the City of Mbeya, but improvement should be done in terms of education. Accident rates recorded as much as 34.7% is too high which is not indicated in this study in terms of cost implication.

Moreover findings as indicated in Table 6, shows that Outerwear /Overall and Safety Footwear recorded as 84% in use, were the most Protective gears used in industries in this research. Results suggest that most of bodies of employees were covered; this signifies how safety rules and policies are being continuously adopted in industries.

2.1.7. Findings on to recommend measures to be taken in order to have safe environment:

The study found that, it possible to eliminate the problem of accidents and injuries, even fatal in industrial place. Table 7 below show how the recommendation of the respondents

Table 7: Respondents’ Recommendations

		Frequency	%	Valid %	Cumulative %
Valid	Special care should be taken in the design of jobs	13	15.9	15.9	15.9
	To reduces the possible motions that reinforce fatigue of muscles	17	20.7	20.7	36.6
	OHS principles should be initiated and properly followed	22	26.8	26.8	63.4
	Commitment of all individual involved at work place	20	24.4	24.4	87.8
	The use of PPE is essential and should be monitored	10	12.2	12.2	100.0
	Total	82	100.0	100.0	

Source: (Field finding, 2014)

Results in Table 7, show that large number of industries with 22 (26.8%) respondents, claim that Occupational health and safety principles should be initiated and properly followed to eliminate physical risk factors faced by workers. As a general fact, most of OSHA activities are well distributed to larger Manufacturing Engineering Industries compared to smaller ones. This is the likely reason that why smaller industries suffer compared to larger Industries. Lack of knowledge and poor investment in smaller industries, contributes a lot a lack of higher commitment on observing OSHA’s regulation. Generally Industrial safety and health standards are to aid employers, supervisors, workers, health and safety committee members, safety and health personnel in their efforts toward achieving compliance with health and safety standards most frequently cited, and which cover particularly hazardous situations in the workplace.

2.1.8. Findings on the proposed way to follow so as to apply OSHA principles:

The study found that in order to have better performance in smaller engineering industries, 29 (35.4 %) of the respondents said that the punishments for those who are against occupational safety and health principles must be provided and 53 (64.6%) of the respondents said that the provision of training frequently about the application and practices of occupational safety and health principles is required, See table 8 below

Table 8: Shows the respondent’s proposed way to follow so as to apply OHS principles.

		Frequency	%	Valid %	Cumulative %
Valid	To provide punishments	29	35.4	35.4	35.4
	To provide training	53	64.6	64.6	100.0
	Total	82	100.0	100.0	

Source: (Field finding, 2014)

These findings comply with board of knowledge that the key element in order to prevent and control accidents in the industrial place is to provide education and training to all management leadership and worker about the occupational health and safety. However the greatest challenge is education and Training on OSHA principles are concentrated to higher industries which can sponsor Trainers from Head Quarters. This will decrease the possible causes of accidents in Small Engineering Industries. The study also complies with that Ali, [6] whose argument was that it's possible to eliminate the problem of accidents and injuries, even fatal in industrial place by providing education to workers and the commitment of workers to OHS. The study showed that large number of industries claim that Occupational health and safety principles should be initiated and properly followed to eliminate physical risk factors faced by workers.

2.1.9. Findings on the general comment about implementation of OSHA principles:

The study found that the implementation of occupational safety and health principles in Small Engineering Industries in Mbeya city is poor clearly indicated in Table 8. The results comply with results in Table 6 on occurrence of accident in industries, which partly contributed by the lack of knowledge on safety measures.

Table 8: Implementation of OHS in Small Engineering Industries

		Frequency	%	Valid %	Cumulative %
Valid	Poor	30	38.0	38.0	38.0
	Medium	23	29.1	29.1	67.1
	High	26	32.9	32.9	100.0
	Total	79	100.0	100.0	

Source: (Field finding, 2014)

3. CONCLUSION

The research work analyzed occupational safety and health of the Small Engineering Industry at Mbeya city. The research surveyed several literature sources on Introduction of Occupational Safety and Health. Moreover, different Engineering Industries in Mbeya urban were surveyed. All results found provide general overview based on the outcomes of the study and all about giving ahead for further study. The purpose of this research was to provide reasonable safety for life, limb, and health of employees in cases of practical difficulty or unnecessary hardship. The specific requirements of this research are upon an employer for the protection of such employer's employees and no others apply to all small engineering industries subject to the Workers' Compensation.

As a minimum requirement, greater effort is now needed to study the occupational health and Safety consequences of global economic and trade reforms, and standards put in place to protect workers' health. Adequate public-sector and union capacity for setting standards and enforcement should also be insured, as well as international cooperation on norms of safe work; the liabilities of manufacturers, employers, and exporters; and work-safety rights. This means focusing attention on those currently marginalized from the opportunities of globalization. Unfortunately, the most creative social protection systems cannot confront a tidal wave of health problems from insecure, hazardous and low-quality jobs. Instead, attention should focus on the source of the hazard. The health problems emerging from liberalized, competitive production processes demand that production be organized to meet sustainable development goals, not only in terms of economic growth, but also in the development and health of human resources.

4. RECOMMENDATION

To launch an Occupational health and Safety Award as a mean for motivating all organizations in implementing these management systems and Adopting strategies for increasing involvement of all staff in any organization in all health and safety activities, OSHA must provide education about occupational health and safety at any small industries in Mbeya city, the use of Television, Radios, Newspapers etc can serve the purpose. Also, OSHA must ensure compliance with legislative requirements and current industry standards and Support industries in establishing health and safety management systems and obtaining standard Personnel Protective Equipment. OSHA must develop a Code of ethics for

Occupational Health and Safety Professionals (To guide all those who carry-out health and safety activities and set a reference level on the basis of which their performance can be assessed).

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