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RISK MANAGEMENT BEST PRACTICES AND CHALLENGES ENCOUNTERED IN IMPLEMENTING THE RISK REDUCTION STRATEGIES IN INDUSTRIES

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ABSTRACT: *The need to 'mainstream' disaster risk reduction into development is a call to address risks emanating from natural hazards. This, states Benson and Twigg in their guidance notes for use by development organizations, on tools for mainstreaming disaster risk reduction; is evidence of the challenging situation. This paper is an exploration of best practices that can be undertaken by industries to reduce risks. The paper also discusses some of the challenges encountered in implementing risk reduction strategies. The authors thus conducted a study in Eldoret Municipality in the Rift Valley region of Kenya. Purposive sampling was used to select the industries and simple random sampling to select the study units which included Managerial staff and operational workers as well as labor officers in the Ministry of labor (Public Health Officers), fire brigade officers, Kenya National Environment Management Authority (KNEMA) and the Kenya Red Cross Society (KRCS) Regional officials. Interviews and questionnaires were used for data collection. Data was then analyzed using descriptive statistics. Hazard identification, risk assessment, control and monitoring while bottom-up communication and consultation model provided an important best practice for risk reduction. This study will help employers develop emergency response plans for risk reduction.*

KEYWORD: Risk reduction, Intervention strategies, Information, Hazard, Risk management, Risk assessment.

INTRODUCTION

In Africa, disaster risk reduction policies and initiative mechanisms exist at varying degree of completeness, but their effectiveness is limited. A research by UNISDR (2004) indicated that there is a need for a strategic approach to improve and enhance their effectiveness and efficiency since there were gaps in institutional framework, risk identification, knowledge management, governance and emergency response. It was

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also realized that most disaster management structures focus on one or two key natural hazards mainly floods and drought. The policy frame work rarely covers small localized disasters. Disaster risk reduction structures in Africa suffer inadequate financial support (UNISDR, 2004).

The Kenya Minister of State for Special Programs (MSSP) (GoK, 2009) revealed that, Kenya's economy and population is highly vulnerable to natural and manmade disaster risks. There are weak disaster management capabilities within communities and institutions; inadequate integration and coordination and inadequate regional and international linkages (GoK, 2009). According to the Kenya MSSP, Kenya lacks a comprehensive disaster preparedness policy. It has inefficient disaster management framework and strategies, which makes its economy and population highly vulnerable to natural and manmade disaster risks. Major disaster response initiatives are an *ad hoc* and short term basis and mainly comprising of emergency relief. However, it has previously managed some of them without an effective emergency system due to high level of support from the international community leading to huge costs to the country (GoK, 2009). This prompts the need to establish a framework for risk management with best practices to ensure these disaster risks are properly managed. Given that this intervention strategy is procedural, the authors saw it necessary to establish the challenges in implementing these strategies as some organizations majorly fail at implementation.

LITERTURE UNDERPINNING

Effective Communication through Consultation

One of the primary objectives of the Occupational Health and Safety (OHS) Act is to foster a cooperative consultative relationship between employers and employees on the health, safety and welfare of such employees at work. Consultation means to appropriately invite and consider employees responses. A consultative approach will assist in defining the context and ensure different views are considered during a risk assessment process. It allows for ownership of risk identification and treatment of those risks. The Act requires consultation to be undertaken by a Health and Safety Representative (HSR) or an employer before issuing a Provisional Improvement Notice (PIN) in an attempt to reach agreement in rectifying the contravention (of the Act of Regulations) or preventing the likely contravention (UQ, 2010).

Effective communication through consultation establishes a framework that allows for the active communication between all parties so that different points of view can be presented; all views can be considered before decisions are made, and there is room for negotiation about the different points of view with the aim of achieving resolution of any dispute (UQ, 2010). Effective communication through consultation leads to increased staff morale and productivity, improved management decisions on OHS issues, a healthier environment for all employees; a reduction in the incidence, severity and costs (both direct and indirect) of workplace injury and disease. It also leads to improved working relationships and an understanding between management and employees of each other's point of view. There will be employee commitment to OHS and ownership of the outcomes of the consultation and effective lines of communication with people knowing who to contact about OHS issues. With effective communication

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and consultation, appropriate forums that address issues of concern whenever necessary can be put in place (UQ, 2010).

The authors through an interview sought to find out communication and consultation framework available in Industries for workers and managers or employers in order to reduce risks in their workplace. It was also necessary to know how managers addressed issues of concern to reduce injury and diseases or workers.

Provision of Appropriate Information, Education and training

There is need to provide staff with adequate training so that they have the necessary knowledge and skills to participate in the consultative process and provide OHS information in the workplace (UQ, 2010). Regularly discussing health and safety at workplace meetings create awareness on differing skills in language, literacy and culture of employees. This should be considered in all communications, as appropriate. Section 16 of the OHS Act of the Queensland Government (UQ, 2010), requires an employer to "take all reasonably practicable steps to protect the health and safety at work of their employee". Employer should ensure that employees are adequately instructed and trained in safe systems of work, for example; safe methods for carrying out tasks; use of equipment or substances; use of health and safety control measures and personal protective equipment; reporting an emergency procedures, and their responsibility for health and safety (UQ, 2010; GoQ, 2002).

An employer is also obligated to provide "to employees, in appropriate languages the information, instruction, training and supervision necessary to enable them to perform their work in a manner that is safe and without risk to their health." [Sub-section 16 (2) (e)] (UQ OHS, 2010). Providing appropriate information, education and training, reduce frequency and severity of workplace injury and disease as staff gain knowledge and skills to perform their duties safely. It also leads to increased awareness of OHS issues within the organization and improve staff morale and corporate culture as staff become more knowledgeable. Appropriate information, education and training can be provided through training needs analysis, education and training programs, dissemination of information, monitoring and reviewing of education and training programs and control risks and prevent workplace injuries.

Intervention for Risk Reduction Program (RRP)

UQ (2010) defines RRP as a systematic application of management policies, procedures and practices that involve; identifying the hazard, assessing the risk, controlling the risk and monitoring and reviewing the risk management process. According to UQ (2010), risk management process is where the staff, supervisors, middle and senior management have a heightened awareness of risks within their environment. They identify, assess and control risks in accordance with the legislative requirements of the OHS Act. There is a reduction in the severity of an accident that results in an associated reduction in pain and suffering. It also leads to a reduction in the severity and incidence of workers' compensation claims, leading to a reduction in associated premiums and hidden costs (such as loss of staff morale, loss of productivity, etc.).

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Regular monitoring of OHS issues can indicate injury trends or recurring hazard in the organization. A good management information system (Figure 1) can indicate injury or illness trends within the agency, which gives management the opportunity to institute prevention action to specifically areas of concern within the agency (UQ, 2010). The process of utilizing Management Information Systems, to achieve a desired OHS outcome, whether it is provision of information for an agency's annual report, or more importantly, provision of a safe workplace for employees is illustrated in Figure 1.

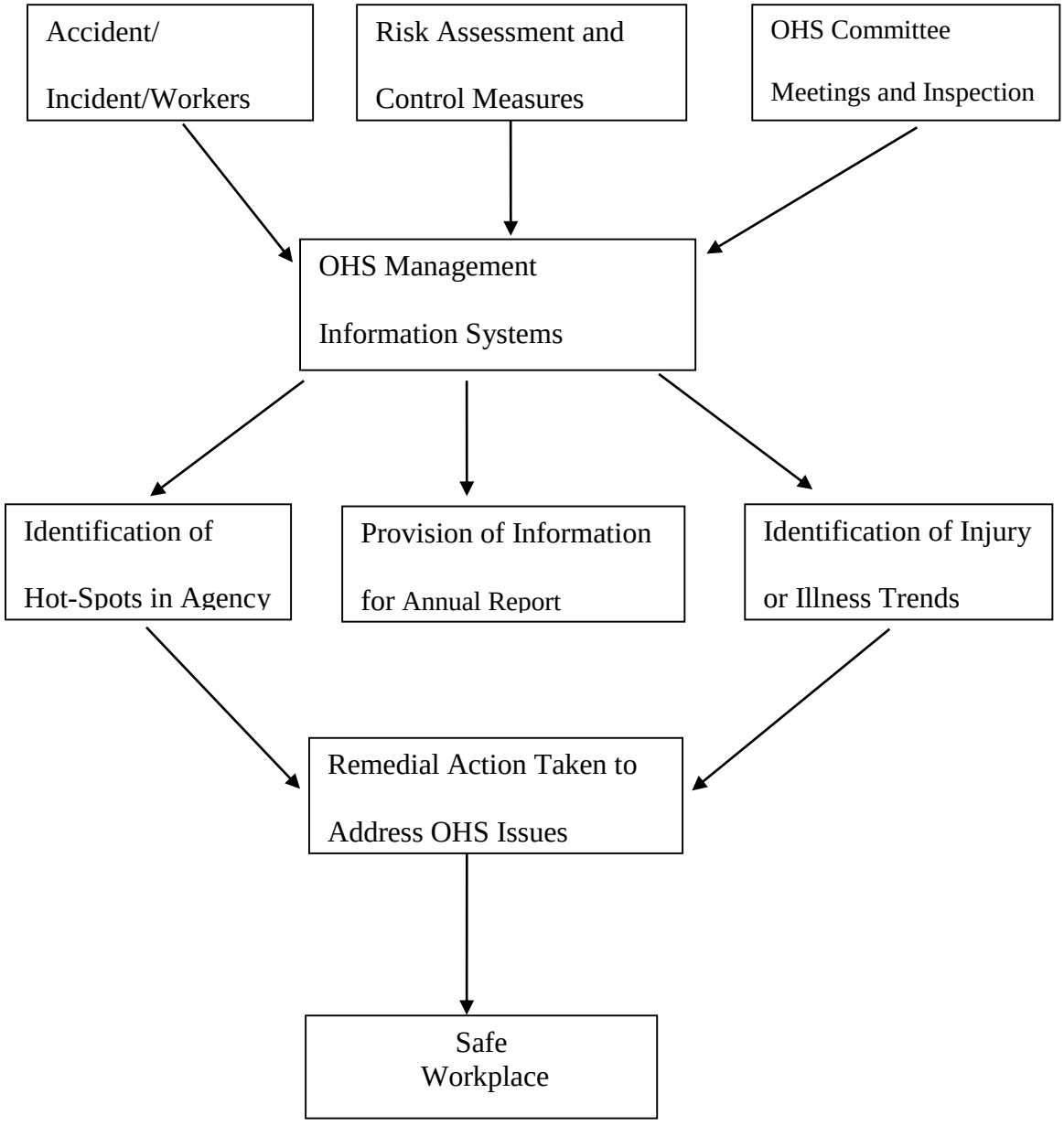

Figure 1. The process of utilizing management information systems

Source: UQ, (2010)

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Risk Management Practices

According to OHS Risk Assessment and Management Guideline (2010), risk management is a logical and a systematic method of establishing the context, identification, analyzing, treating, monitoring and communicating risks associated with any activity, function and processes in a way that will enable organizations to minimize losses and maximize opportunities. Thus, risk management must be an integral part of good management. Risk management is an ongoing process that should be undertaken immediately, including laboratory/workshop/ coursework, when planning or making a significant change, after an incidence, at regular intervals appropriate to the nature of the workplace and hazard present and when obligations (including regulations) change. The management is required to carry out adequate record keeping and risk assessment (UQ, 2010). Table 2 illustrates a risk management cycle.

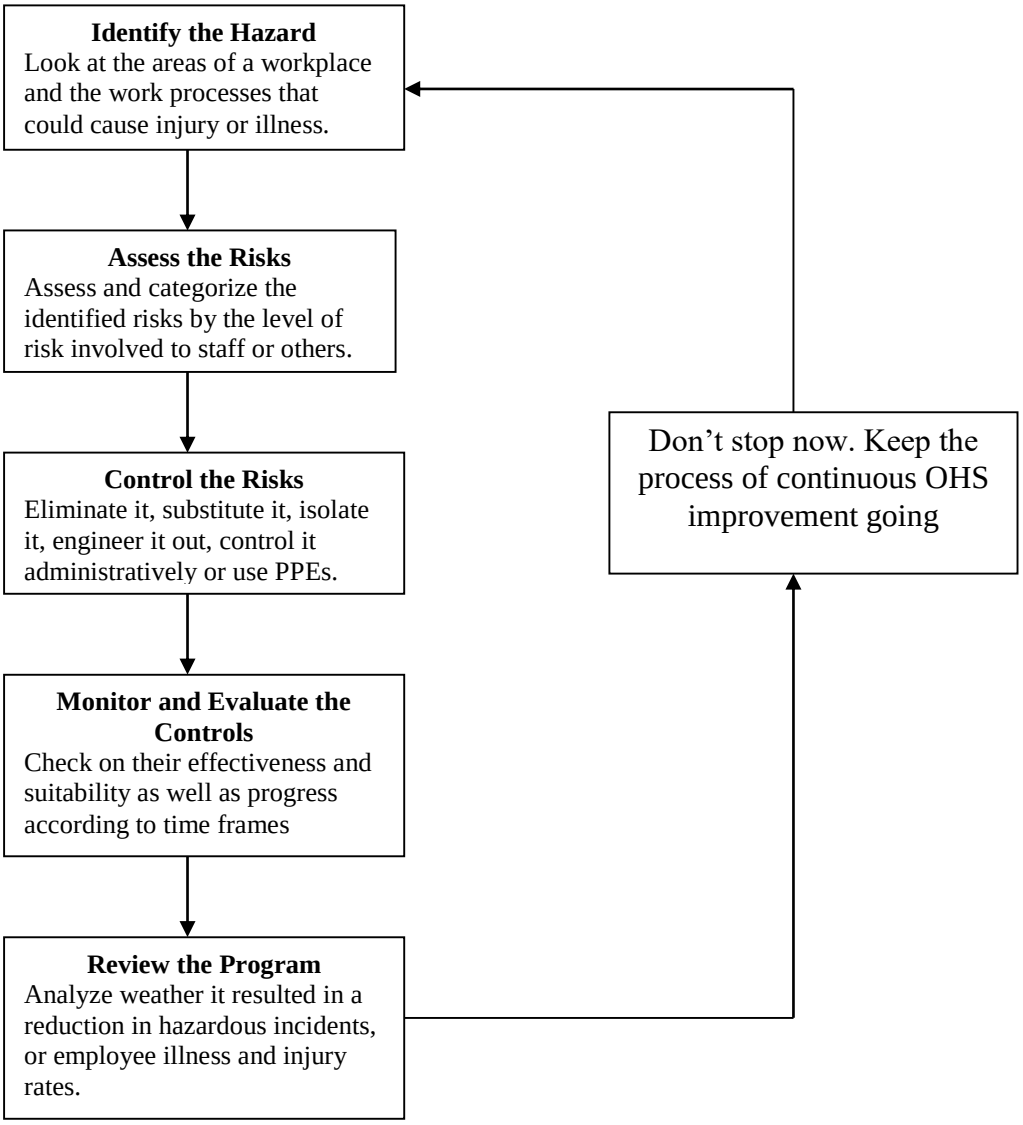

Figure 2. OHSB Management information systems (A risk management cycle)

Source: UQ (2010)

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A risk assessment is an important step in protecting your workers and your business, as well as complying with the law. Risk assessment has five key steps: identifying the hazards; deciding who might be harmed and how; evaluating the risks and deciding on precautions; recording findings and implementing them; and reviewing the assessment and updating if necessary.

Step 1: Identifying the hazard

Hazard identification is the process used to identify all the possible situations which may expose people to injury, illness or disease.

Step 2: Assessing and prioritizing risk

Analyzing a risk involves determination of the consequences (outcome of an incident), exposure (interaction with the hazard) and probability (likelihood that consequences will occur once individual is exposed).

Step 3: Deciding on precautions (measures to control the risk)

A hierarchy of control measures is used to eliminate the risk, or to reduce the risk as far as is reasonable practicable.

Step 4: Recording findings and implementing them

This involves implementing the appropriate measures by developing work procedures in relation to the new control measures i.e. clearly defining responsibilities. Inform all persons about the new control measures and reason for the changes. Provide adequate supervision to ensure that the new control measures are being implemented and used correctly.

Step 5: Reviewing the assessment and updating if necessary

Monitor and review the effectiveness of measures by setting dates to review and record those dates. These steps guided the study while looking at the records on risk reduction programs for risk assessment and risk management in the industries under study. Risk assessment is therefore a process that can help mitigate the risk of disasters in an organization if well implemented. Figure 3 portrays the steps as outlined by UQ, (2010) in performing a risk assessment. Effectiveness of the strategy in risk reduction is dependent on its implementation.

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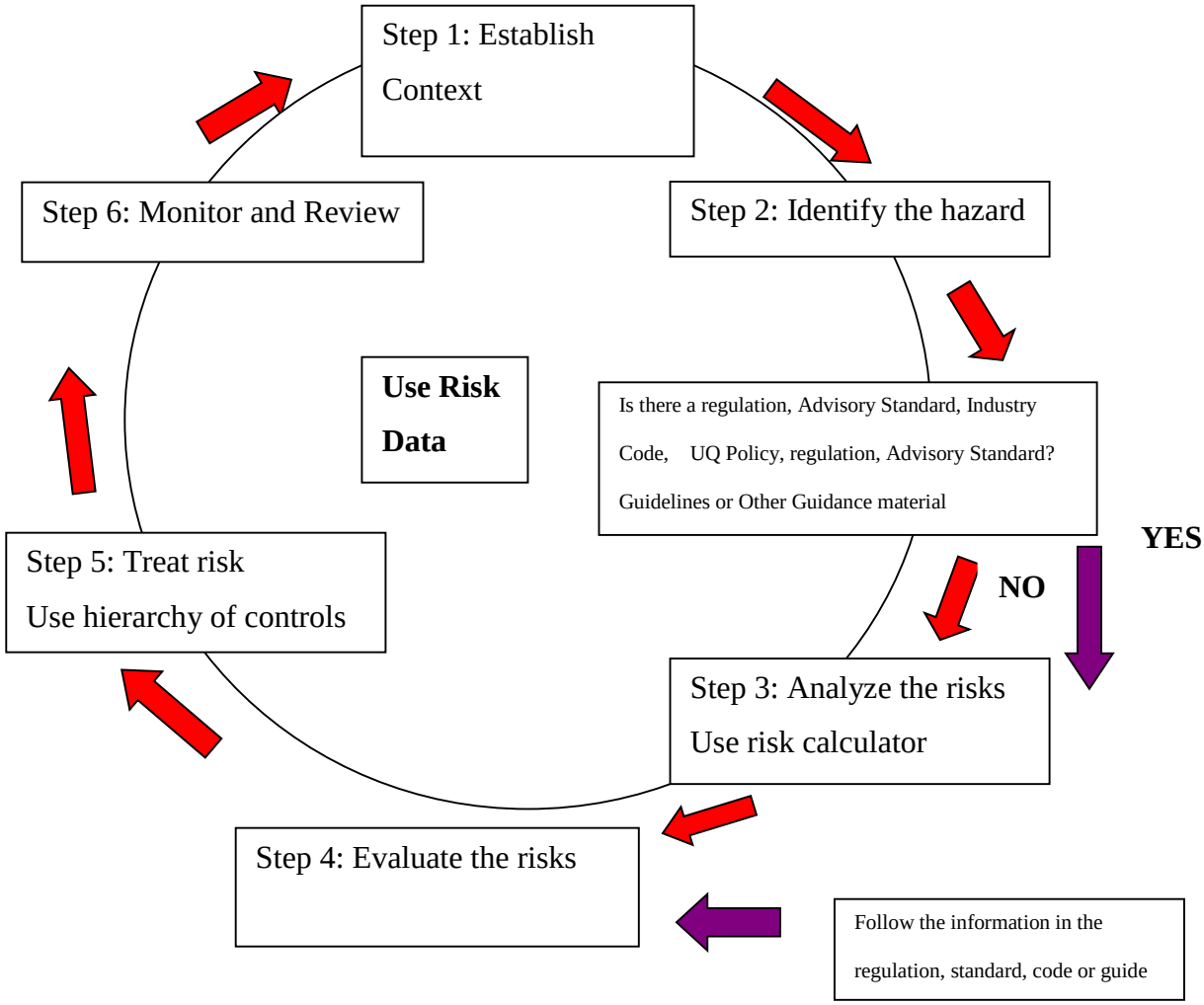

Figure1. Steps followed in risk assessment

Source: UQ, (2010)

Information on risk management practice informed the authors of management practices used in various industries.

Challenges of Intervention Strategies of Workplace Disaster Risk Reduction

There is inadequate data and reporting systems making capturing the effects of workplace risks problematic (Rosenstock *et al.*, 2006). According to Jaeryl and Simpson (2002), factories have no disaster management capabilities. Some do not even have a single fire extinguisher, and those that do may not have people competent to operate them. World Health Organization (Regional Strategy on Occupational Health and Safety on SEAR Countries) posit that lack of training on occupational health and safety, lack of personal protective devices, inadequate training in the proper use of machinery and long hours of working pose a challenge in developing countries.

The situation is further compounded by overcrowding and poor sanitation conditions. Monitoring and surveillance of occupational disease and injuries is inadequate and there is lack of reporting and therefore need for a reporting infrastructure in place.

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METHODOLOGY

Two large scale industries: Raiply woods and Ken Knit; two middle level industries: the Rift Valley Bottlers, and Pyramid Packaging Ltd; and, two small scale industries: the Maize Milling Company and Maji Matamu Laundry formed the authors' choice of factories to be studied. Eldoret town is a home to heavy industries like food processing, steel mills, timber, paper manufacturing and has numerous light and major industries (MCE, 2013).
The target population included managerial staff and operational workers in the selected the factories, Labor officers in the Ministry of labor, Ministry of Industrialization, fire brigade officers, Public health officers, National Environment Management Authority (NEMA) and the Kenya Red Cross Society Regional officials.

The study adopted survey and evaluation research designs. According to Babbie (2010) in *The Practice of Social Research* in a survey design the respondents are selected and standardized questionnaires administered to them. Purposive sampling was used to identify officers or partners of factory occupational health and safety management and preparedness like executive officers in the Ministry of Labour, NEMA and the Kenya Red Cross Society Regional Health Officer and hospitals in Eldoret. This method helped to acquire information that was relevant to the study. The study made intensive inquiry from the few selected individuals as suggested by Kothari (2003). Secondary data that consisted Information on the government policies and strategies was sourced from the Labor officers in the Ministry of Labor, Fire Brigade officers, Public Health officers, National Environmental Management Authority (NEMA) and the Kenya Red Cross Society Regional officials. Primary data on the other hand was collected through interviews and use of structured questionnaires. Face to face interview was conducted with executive officers in the Ministry of Labour, NEMA and the Kenya Red Cross Society regional officers as well as occupational health officer. Information collected from factory workers was analyzed using SPSS software, tabulation was used for summary while percentages were used to calculate the magnitude of work place injuries. Frequencies and percentages were used to show the risk rate in industries. One way ANOVA was used to compare the vulnerability of each of the various scales of industries, to assess variations of qualifications of employees within and between factories.

RESULTS AND DISCUSSION

Effective Communication through Consultation

According to Skinner and Rampersand (2014), there is need for a cooperative consultative relationship between employers and employees on health and safety and welfare of employees at work. Effective communication through consultation establishes a framework that allows for the active communication between all parties, provide different points of view and provide room for negotiations on risk issues of concern so as to reach resolutions of any disputes. Literature showed that this would lead to increased staff morale and productivity, improved management decision, a healthier environment for all employees and improved working relationships.

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Plate 1 shows a form of communication to remind workers on safety requirements written both in English and Kiswahili languages to ensure that the operators understand and follow instructions. Communication in most industries was also made effective:

(i). By calling meetings especially departmental in both large and medium scale industries
(ii). Through written memos and notices as observed on notice boards to give directions and requirements
(iii). By top-bottom and bottom-top communication which in Rift Valley Bottlers is encouraged while in the other industries departmental supervision is key.
(iv). Given that the large and medium scale industries, had accident register books where they registered all accidents and also made annual reports for audits.
(v). In case of emergencies office telephones and mobile phones through observation and interviews are of great value.

Plate1. A safety and healthy poster at the Rift Valley Bottlers

Provision of Appropriate Information, Education and Training

It was observed in the literature review that there is need to provide staff with adequate training so that they have the necessary knowledge and skills to participate in the consultative process and provide OHS information in the workplace. The training of individuals must align with the needs of the industry and there is need for pre-employment and on the job training (USAID, 2011).

Education and Training of Staff in Industries

A chi square (χ^2) *test*statistic ($\chi^2_{5,\,0.01}$ =266.93) for 5 degrees of freedom, was 266.93. It also indicated a significance value of (0.000), less than usual threshold value 0.01. This suggests that there is a highly significant ($P < 0.01$) variation among skills gained and training received in industries.

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Table1. Education and training of staff at the work place

Type of training and skills gained	Frequency	Percent
None	286	34.9
Occupational health measures	165	20.1
Protective measures	131	16.0
Fire safety	114	13.9
Risk control measures	91	11.1
Disaster management	33	4.0
TOTAL	**820**	**100**

Source: (Authors, 2015)

From Table 1, it is clear that 34.9 % of the total population did not receive any training even in their area of jurisdiction. Lack of training therefore exposed workers to risks especially those dealing with chemicals, machines and electrical appliances. One third of the people employed in the industries under study were not trained in any area of occupation health measures and therefore vulnerable to hazards. However, a larger percentage of employees (65.1%) have received some form of training on either of the areas of health, disaster and risk management as shown in Table 1 occupational health and safety thus reducing risks to disasters.

The interviews conducted revealed that the large-scale industries also conducted risk assessment for each department and compared the results discussed by employees, and undertook corrective measures for example an individual employee being sent to other organization for training or being trained internally.

Risk rating in the Department in Industries

Chi- square *test*statistic ($\chi^2_{5,\,0.01}$ =1041.976) for 5 degrees of freedom was 1041.976. It also indicated that the significance value (0.000) was less than the usual threshold value 0.05. This suggests that there was a significant relationship for the risks being rated in the departments of various industries in Eldoret Municipality in Kenya.

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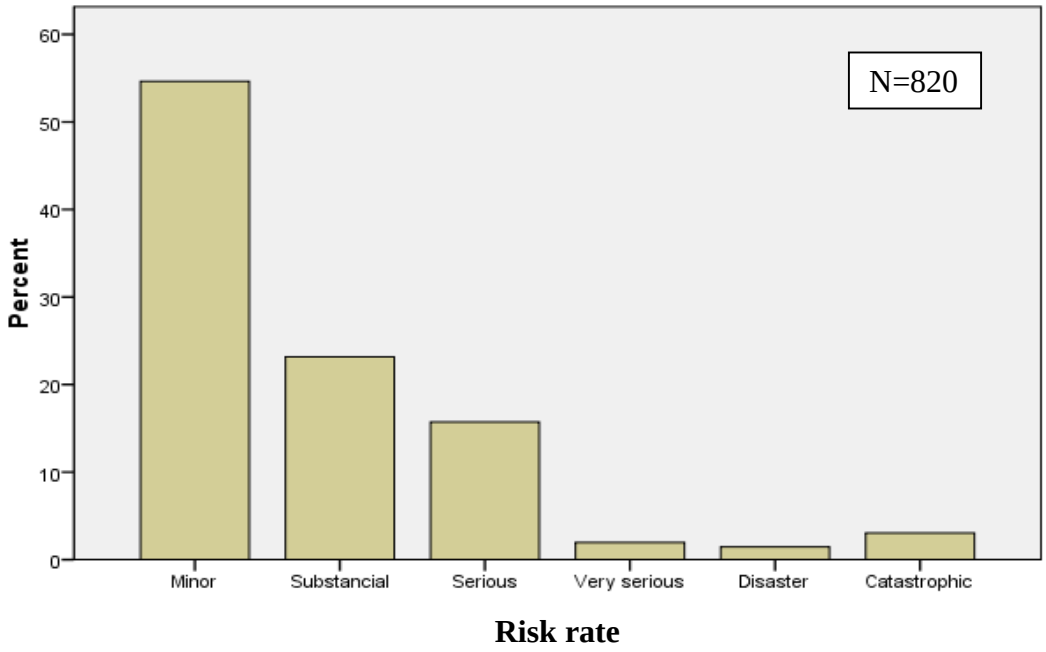

Figure 4. Risk rating in the departments

Figure 4 above elaborates that many accidents or risks workers are exposed to in various industries in Eldoret Municipality in Kenya are categorized as minor risks. They occupy about 55% of the risks of exposure. Very serious, catastrophic and disaster risks happen though in minor cases as represented by less than 5%.

Risk Reduction Intervention Programs

This is a systematic application of management policies, procedures and practice that involve; identifying the hazard, assessing the risk, controlling the risk and monitoring and reviewing the risk management process. These reduce severity of incidences and associated premiums including hidden costs. There is need to indicate injury or illness trends within the agency so as to institute prevention action in specific areas of concern within the agency. It ensures compliance with legislative reporting requirements (UQ, 2010).

Occupational health and safety committee which was identified in large and medium scale industries carried out safety Audits internally by use of various teams within the organization for example fire committee carryout fire audits. They also invited an external auditor to carry out: safety, fire and environmental audits, and noise survey for example using the DOSH officials from the ministry of labor whose role was to ensure safety measures and welfare of workers in industries. They also used NEMA to carry out environmental assessment and Fire Brigade services to inspect fire extinguishers to ensure they were in a working condition.

These committees had regular meetings in which they gave reports of their audits and planned the way forward with the help of the administrators. For example the Rift Valley Bottlers had established a safety week safety progress in which each department

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was assessed. The best performers were rewarded and given certificate of recognition for best compliance. They had also established weekly safety slogans which they used to mock non-complaints and to remind other members to comply with safety issues. Plate 2 shows a poster with one of the slogans used after a vehicle incurred an accident leading to breakage of bottles. Such photographs were taken by OHS coordinator and e-mailed to heads of departments who printed and posted them to members of department or used it as a basis to undertake retraining of the members involved.

Plate 2. One of safety slogan in Rift Valley Bottlers

Interviews with the Ken Knit Ltd supervisors revealed that the industry had introduced new technologies which involved production using computerized machines with automatic switches which stopped the machines after identifying a fault. Besides this, observation revealed that they had also opened gangways and enlarged exits that allowed for easy escape in case of emergency.

Challenges Faced by Industries in their Attempt to Reduce Risks

Rosenstock *et al* (2006) found that there was inadequate data and reporting systems making identification of the effects of workplace risks problematic. This study found out that the biggest challenge for risks reduction attempts was inadequate training and demonstration facilities accounting for (32.8%). Ignorance of employees in using PPEs was also a challenge accounting for 26.1%. Ignorance of employees in the use of PPEs was also quite significant as illustrated in Figure 5.

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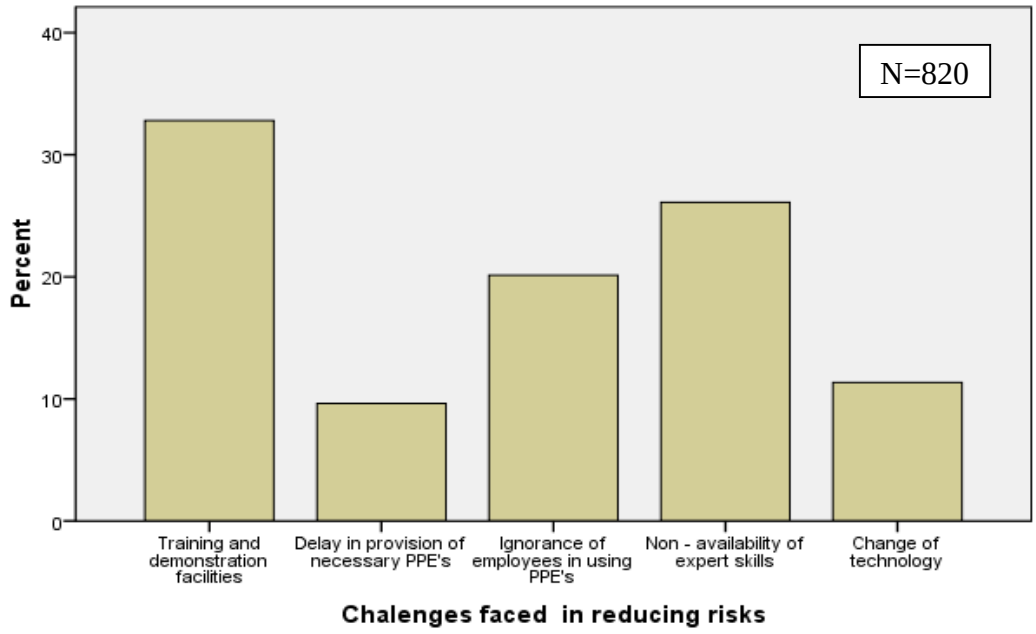

Figure 5.Challenges faced in risk reduction in industries

Source: (Authors, 2015)

Lack of training and demonstration facilities was rated most challenging with 33% while delay in provision of the necessary personal protective equipment was rated the least challenging at 10%. This is an indication that even though most industries do not have facilities for training their employees on the necessary risk reduction programmes, they strive hard to ensure that their employees are well equipped with protective wear and equipment. Availability of these PPE however does not guarantee reduced risks as a high percentage (21%) of the employees are ignorant about the use of these equipment. A Chi-square statistic ($\chi^2_{4,\ 0.01}$ =157.268) calculated for 4 degrees of freedom was157.268. It also indicates that the significance value (0.000) was less than usual threshold value 0.01. This suggests that there was a high ($P<0.01$) variation among challenges faced in risk reduction in the departments of various industries in Eldoret Municipality in Kenya.

IMPLICATION TO RESEARCH AND PRACTICE

The results of this study will assist in the analysis of technologies' hazardous effects and addressed knowledge gaps on interventions strategies. The study will provide necessary information to stakeholders in the development efforts towards adoption of successful DRR programs and interventions for workplace health and safety. This will assist the factories' management to enhance workplace health and safety initiatives. It will increase the community's awareness of possible hazards in manufacturing, handling and use of hazardous material and improve their attitudes for effective disaster risk reduction. The study results showed challenges industries face in their attempts to ensure workplace health and safety, and thus, this will help employers develop emergency response plans for risk reduction. It will also fill gaps on intervention strategies in industries and add new knowledge for use for future studies.

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CONCLUSION

Risk reduction intervention is a major intervention strategy that involves hazard identification, risk assessment, control and monitoring as well as risk management. This ensures compliance to reporting, information recording and management. Information, education and training provide skills for risk reduction whether on job or prior to employment. Effective bottom-up communication and consultation model provides an important framework for risk reduction.

RECOMMENDATIONS

(i) Industries should take initiative to train and sensitize their employees on the Occupational health and safety.
(ii) There is need for industries to include training and demonstration facilities in their financial plans so as to avail them whenever they are required for training staff.

REFERENCES

Babbie, E. R. (2010). *The practice of social research*. Belmont, Calif: Wadsworth Cengage.

Benson, C. & Twigg, J. (2007). Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations. Geneva: Pro Vention Consortium.

GOK.(2009). *Economic Survey.* Nairobi: Government Printer.

GoQ. (2002). *Guidelines for major hazard facilities: Education and training.* www.deir.qld.gov.au/workplace/resources/pdfs/chm/MHF-05-OGL1-education-training.pdf.

Rosenstock, L. A. (2006). *Occupational health.* In *Disease Control Priorities in Developing Countries (2nd Ed.) Chapter 60*, California: World Bank.

UN/ISDR. (2004). *Living with risks: A global review of disaster reduction initiatives 2004 version.*Retrievedon 22nd January,2012.from www.unisdr.org/we/inform/publication/657

UQOHS (2010). *Occupational health & safety risk assessment risk and management guideline.* Retrieved from http://www.uq.edu.au/ohs/pdfs/ohsriskmgt.pdf on 17th January.

UQ (2010). *Occupational health & safety risk assessment risk and management guideline.* Retrieved from http://www.uq.edu.au/ohs/pdfs/ohsriskmgt.pdf on 17th January.

USAID. (2011). *Disaster Assistance: Kenya, Disaster Assistance at a Glance.* Retrieved from http://www.reuters.com/article/news one/ on 27th January, 2011.

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