OCCUPATIONAL SAFETY AND HEALTH STATUS IN THE INFORMAL NON-FOOD MANUFACTURING SECTOR IN KAMPALA CITY, UGANDA

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A Thesis Submitted to the Graduate School in Partial Fulfilment for the Requirements of the Degree of Doctor of Philosophy in Environmental and Occupational Health of Egerton University

EGERTON UNIVERSITY

OCTOBER 2019

DECLARATION AND RECOMMENDATION

Declaration

This thesis is my own original work and has not been presented for award of any degree in this or any other University.

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ND15/14692/15

Recommendation

This thesis has been submitted with our approval as University supervisors.

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DEDICATION

This work is dedicated to my late father Mr Yekosofati Mutsongo, my mother Kevina Watsemba and my dear wife Sharon Ankunda whose prayers, encouragement and understanding enabled me to complete the programme.

ACKNOWLEDGEMENTS

First and foremost, I wish to thank the Almighty God for the abundant grace, will, wisdom, courage and strength to carry out this research. Secondly, I would like to express profound gratitude to Egerton University Department of Environmental Science for the offer to pursue the Degree of Philosophy in Environmental and Occupational Health. Thirdly I wish to acknowledge the most valuable time and energy provided by my supervisors, Prof. Wilkister Nyaora Moturi of Egerton University and Dr. Stanley Maingi Makindi of Machakos University and the entire Egerton University for the valuable academic advice, guidance, encouragement and the resources accorded to me throughout the research process. Fourthly I would like to thank Kyambogo University management for tuition and research funds on Staff Development sponsorship to embark on the PhD programme at Egerton University, Kenya. Fifthly, I would like to appreciate the Department of Occupational Safety and Health in the Ministry of Gender, Labour and Social Development, Uganda and Kampala Capital City Authority for the permission to carry out the research in Kampala City. My greatest regards also go to my family for their patience, encouragement and support, and my research assistants Sharon Kansiime and Sharon Akot for their dedication during data collection. Lastly I would like to thank my friends; Louis Mwamlima, Paul Walakira, Steven Mwalye and Ambrose Ssentongo, for their encouragement, intellectual clarifications, support and criticisms that helped me achieve the objective of this work

May the Almighty God bless you.

ABSTRACT

The informal sector is an engine of growth with more than 1.8 billion people globally and one billion workers in developing countries producing a greater portion of GD (25-60%) in developing countries. It provides employment opportunities to majority of the population in both developing and developed countries. However the sector is unregulated and recorded in government statistics. There are high and tragic incidences of occupational related accidents and injuries that go unabated in Kampala. The purpose of the study was to assess the OSH status in the informal non-food manufacturing sector and identify interventions in Kampala. A cross sectional survey design was used, both qualitative and quantitative data were collected. 424 firms were sampled; manufacture of metal products, furniture, textiles and clothing, concrete and brick, paper and paper recycling, repair of machinery and other manufacturing sectors of the informal sector. Data on hazards and control measures, knowledge, attitudes, administrative measures and compliance were obtained using questionnaires, checklists and interview, on OSH Legal framework were obtained from ILO OSH conventions, Acts, textbooks and government reports and analysed into frequencies, percentages, chi-square and multivariate regression. Various types of hazards were identified; inadequate ventilation 66 (50.4%), optical radiation 55 (44%), extreme weather 88 (37.4%), extreme heat 71 (34.3%), extreme noise 79 (27.9%), in manufacture of metal products. Noxious gases 91 (26.7%) and paints 66 (19.5%) in furniture and metal products while sharps 77 (21.3%) were in manufacture of metal products. Ergonomic hazards heavy lifting 67 (19.5%) in metallic products and psychosocial hazards such as stress accounted for 105 (30.5%) in metal products. Factors affecting OSH practices at $p< 0.05$ were; age $\chi^2 = 51.3$, gender $\chi^2 = 23.9$, marital status $\chi^2 = 17.1$, education level $\chi^2 = 147.3$, period working in *Jua-kali* $\chi^{2,} = 87.5$, number of employees at work $\chi^2 = 69.9$ and hours spend per day $\chi^2 = 19.8$ while the CORs were; age 0.0467- 0.0478, gender 0.0918-0.0997, education level 0.0859-0.0819, PPE usage 0.0317-0.0319). All the enterprises lacked awareness on OSH regulations, workplace OSH policies and certificates of machinery inspection. Knowledge of occupational hazards and control measures was moderate 271 (70%) while attitude towards hazard control measures by complying with safety precautions was very poor (below 16%). Compliance with hazard control measures was low, however PPE usage was 254 (65.4%) and 239 (61.6%) applying hazard control measures in the informal sector. Creation of awareness through mass media, training and awareness, provision of OSH regulations and regulation by government were recommended.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACIP	Atlantic Collaborative for Injury and Prevention
COBE	Census of Business Establishments
DOSH	Department of Safety and Health
GDP	Gross Domestic Product
GoU	Government of Uganda
HESAWA	Health and Safety at Work
HCS	Hazardous Chemical Substances
HSE	Health and Safety Executive
ICLS	International Conference of Labour Statisticians
ILO	International Labour Organization
ISO	International Organization for Standardization
KCC	Kampala Capital City
KCCA	Kampala Capital City Authority
NOTU	National Organization of Trade Unions of Uganda
OATUU	Organization of African Trade Union Unity
OECD	Organization Economic Cooperation and Development
OHSAS	Occupational Health and Safety Act Standard
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Act
PDCA	Plan, Do, Check, Act
PHC	Primary Health Care
PPE	Personal Protective Equipment
SDGs	Sustainable Development Goals
SSASHEW	Strengthening Safeguards, Safety and Health at Workplaces
SPSS	Statistical Package for the Social Sciences
UBOS	Uganda Bureau of Statistics
UNCST	Uganda National Council of Science and Technology
USEPA	United States Environment Protection Agency
US OSHA	United States Occupational Safety and Health Administration
WHO	World Health Organization
WIND	Workplace Improvement in Neighbourhood Development
WISE	Workplace Improvement in Small Enterprises
NEMA	National Environment Management Authority

CHAPTER ONE
INTRODUCTION

1.1 Background Information

The urban informal sector is described by the International Labour Organization (ILO) as part of the national economy, composed of a wide range of small scale economic units producing and distributing goods and services, consisting largely of independent and self-employed producers in urban areas of developing countries. These small scale economic units usually employ personal or family labour or a few hired workers or apprentices. Typically, these units operate with little technology and skills, low level of productivity and provide very low and irregular income. Their primary objective is to generate employment and basic income to individuals directly involved. Generally, they are not registered or regulated and do not benefit from government support and subsidies. Safety and health issues are hardly considered while work accidents are rarely reported and compensated. The sector is ‘‘informal’’ due to the fact that it is unregulated and not recorded in official statistics (ILO, 2000). It encompasses a range of economic units in urban areas that are mainly owned and operated by individuals, either alone or in partnership with family members of the same household, and spans a range of sectors that include; handcrafts, leathercrafts, woodworks and carpentry, metal fabrication, electrical and electronics, ceramics and pottery, textiles and garments, hair dressing, printing and graphics, chemicals and pharmaceuticals, building materials and construction, food and beverages, and agro processing amongst others (Chattopadhyay, 2005).

The informal sector is an engine of growth with more than 1.8 billion people globally, one billion workers in developing countries and accounts for a greater portion of Gross Domestic Product (GDP) (25-60%) in developing countries. Estimates from the World Bank, Organization for Economic Cooperation and Development (OECD) and ILO show that; East and South Asia has 1.26 billion informal workers (67% of the workforce); Latin America has 178 million informal workers (63% of the workforce) and Sub Saharan Africa has 152 million informal workers (45% of the workforce) (Marten, 2013). In Africa the informal sector accounts for 75% of non-agricultural workforce that work informally (ILO, 2002). It has a non-regulated labour market which usually involves workers without written arrangements with the employer and usually not registered in government records. In Kenya, it is referred to as the informal economy or the ‘‘*Jua-kali”* and plays a very important role in

the economic development of most developing countries of the world (Mogane, Ntilailane, Renton, Manganyi, Mizan, Vuma, Madzivhandila, Maloisane, Lek-getho and Sekobe, 2013).

According to Buhlebenkosi, Sibanda, Chaurura and Chiriwa (2013), the informal sector provides an employment refuge to people who fall out from the formal sector in times of economic depression and provides a "safety net" to the poor households' income. Not much work has been done towards understanding the conditions in the informal non-food manufacturing sector working conditions mainly because of the informality of the enterprises. Most informal activities are unrecorded in official statistics and hence the measurement of informal productivity and labour force is difficult. Although the informal sector activities are a significant source of detrimental externalities, very little attention has been paid to the problem by either researchers or policy makers. Karanja, Muchiri and Muruka (2003), state that most small enterprises are family based and operate mainly outside the main institutional regulatory framework lacking supervision. Even if they are covered by the laws, their standards of safety and health are so low that they hardly meet the requirements for registration of workplaces. Occupational accidents and diseases are rarely reported and never compensated, the businesses are not covered by national social security schemes and when old age or ill health strikes, the operators of many enterprises go underground or hide.

Globalization has facilitated the rapid increase in informal employment and has been associated with the "generation of employment that is flexible, precarious and insecure" (Lund and Nicholson, 2003). According to Lund, Alfers and Santana (2016), a large number of workers worldwide work informally, yet the discipline and practice of occupational safety and health covers largely only formal workers in the formal workplaces. Karanja *et al*. (2003) point out that the cost in human terms of the existence of the informal sector and ways in which it is sustained is tragic. Workers in the informal sector activities often toil for low wages, under poor and inhumane conditions and unhealthy environments. Enforcement and compliance with safety and health standards are unknown.

Many informal jobs are not only "flexible, precarious and insecure but are also hazardous and take place in unhealthy and unsafe environments (Burton, 2010). Informal sector workers operate in inhumane conditions and makeshift places without sanitary facilities. Examples of such environments include road reserves, informal market places, wetlands/ marginal lands and poorly serviced homes, all of which can expose workers to

environmental hazards, disease, traffic accidents, fire hazards, crime, assault as well as weather related discomfort and muscular- skeletal injuries. Despite the risks involved, due to it is unconventional nature and location, informal workers in most African countries are not protected by institutions mandated to protect them. Conventional occupational safety and health institutions have been designed to protect formal workers in the formal sector environments (Alfers, Draft, Joronen, Oluranti, Surienty and Sains, 2012). Lund *et al*. (2016) state that informal workers operate in a typical and non-standard workplaces excluded by definition from occupational safety and health protection measures.

An occupational hazard is something unpleasant that you may suffer or experience as a result of doing work or hobby (Valentic, Stojanović and Vukelić, 2005; Aluko, Adebayo, Adebisi, Ewegbemi, Abidoye and Popoola, 2016). Hazards exist in every workplace in many unusual forms; pointed edges, falling objects, flying sparks, chemicals, dust, fumes, noise and numerous potential hazardous situations (Amir, Hashim, Qandee, Ishtiaq and Anam, 2017). The Unites States Occupational Safety and Health Administration (US OSHA, 1970) requires that employers protect their workers from workplace hazards that can cause damage to them. According to ILO (2013a), about 234 million people die each year from work-related accidents and diseases. Globally, as many as 317 million non-fatal accidents occur and 160 million non-fatal work-related diseases emerge annually, non-fatal accidents and occupational diseases globally cost the economy 4% of GDP. Workplace hazards continue to exert a large charge on society in terms of morbidity, mortality, financial and social costs which provide justification for the ongoing commitment to the protection of the health of the workforce (Schlaich, Reinke, Savenich, Reimer, Oldenburg and Baur, 2009).

The informal employment is associated with increased levels of illness and injury because informal workers are exposed to greater health risks due to poor work or occupation-related conditions as compared to formally employed workers. Many workplaces are unsafe resulting in illness and injury; nearly half of all wage workers in Bangladesh and Latin America reported unsafe workplace conditions, while more than 60% of the informal women workers in India reported physical weaknesses due to poor working and living conditions (Marten, 2013). The author further states that in South Africa, the incidence of work injury was 7.2 times higher in the informal versus formal sector and in the Philippines, more than 50% of non-fatal injuries are incurred by self-employed informal workers. In addition, children may suffer direct health issues from parents' work, such as lead poisoning

due to home-based battery manufacturing and asthma among street vendors' children who work with their parents.

According to WHO (2014), occupational health can be influenced by inequitable global, national and local level arrangements with negative physical, psychological, economic, political, religious and cultural factors that put people into harm (social determinants). Social determinants of health are conditions which people are born, live, work and grow in. These are globally affected by the distribution of money, power and resources and locally influenced by policy choices. How societies arrange themselves determine who gets sick and injured, receives treatment, healthy or not.

Apart from social determinants of occupational safety and health, legal framework plays a very big role in influencing occupational safety and health in the informal sector. Key among these are occupational safety and health law, occupational safety and health policy, labour inspections, occupational safety and health audits, social protection and labour training. According to Ndegwa, Guyo, Orwa, N'gang'a and Murigi (2014), the effectiveness of a legal system defines the occupational safety and health outcomes of any nation. Government laws and regulations have a very strong influence on the extent to which firms implement occupational safety and health programmes. Sometimes employers are not willing to provide comprehensive occupational safety and health programmes and government enforcement is necessary to exert pressure on them. In countries where governments have firm laws and regulations, implementation of occupational safety and health has been successful (Ndegwa *et al.*, 2014). However, the informal sector is not regulated especially in developing countries which makes implementation of occupational safety and health difficult.

According to the Auditor General's report (GoU, 2016a), "despite the existence of the OSH Act (2006), many workers in Uganda are not aware of their rights to a safe and healthy working environment and have remained exposed to unhealthy working conditions". The Auditor General further states that although the country's economy has registered a number of achievements, various aspects of occupational safety and health have not been adequately addressed. Management of occupational safety and health issues at workplaces continue to be left unattended by different sectors of government and the private sector. Uganda has an estimated 10 million working people, with an estimated number of occupational related accidents of 2,168 and a fatality rate of 21.7 % in 2005. The high level of vulnerability to

occupational safety and health hazards arise partly from the nature of work environment and operation of machines that subject operators to high risk of accidents (Kintu, Kyakula and Kikomeko, 2015). Notable incidences of fatalities and injuries in Uganda include death of a maintenance engineer, electrocuted and crushed to death and injury of six technicians at Roofings Steel Mills Plant, Namanve Industrial Park and death of a technician and 10 injured workers at Tembo Steel Mills in Iganga district (Kintu *et al.*, 2015).

The Uganda Vision 2040's anticipated goal of a middle income economy is hinged on the informal sector, which is Uganda's engine of growth with 2.5 million people employed in the sector and accounting for 90% of the entire private sector. The sector generates 80% of manufactured output and 20% of GDP (UBOS, 2014). The sector is also key in addressing Sustainable Development Goals 1, 3, 8 and 9 on poverty elimination, promotion of opportunities and protection of labour rights under the United Nations. However, this particular sector is not regulated by government in terms of occupational safety and health as Uganda does not have a national safety and health policy and plan (GoU, 2004). Kampala City's specific occupational safety and health data is inadequate and outdated in terms of the workforce, actual fatalities, injuries and ill health. Between 2000 and 2003, Kampala City accounted for 84% of the country's fatalities and 55% of the injuries were in manufacturing sector (GoU, 2004). This study will therefore provide information and contribute to the understanding of the various occupational safety and health hazards and the predisposing factors to workers in the informal non-food manufacturing sector in Kampala. It is also envisaged the study will expand the knowledge base of policy formulators and implementers to ensure the adequate safety and health of employees in Kampala City.

1.2 Statement of the problem

The informal non-food manufacturing sector is heterogeneous due to the diversity of activities undertaken and provides employment opportunities to majority of the population in the world. Many informal jobs are not only flexible, precarious and insecure but hazardous and usually take place in unhealthy and unsafe environments. There are high and tragic incidences of occupational related fatal accidents and injuries in the informal non-food manufacturing sector in Kampala City. Occupational safety and health data is inadequate and out-dated in terms of the workforce, actual fatalities, injuries and ill health. Between 2000 and 2003, Kampala City accounted for 84% of the country's fatalities and 55% of the injuries were in manufacturing sector (GoU, 2004). Fatal accidents and injuries from occupational

hazards at work have morbidity, mortality, financial, social and economic implications on the workforce productivity. The result is incapacitation, loss of wages, loss of productive time, inability to raise resources to support the family, cost to society and above all reduced development of the economy. This has huge ramifications in the labour market and the economy of a country. Occupational safety and health data is needed for policy formulation and implementation to address the situation. This study will therefore fill the knowledge gaps by generating data on occupational safety and health status in the workplaces, the workplace hazards and factors contributing to this scenario in the informal non-food manufacturing sector for redress.

1.3 Study objectives

1.3.1 Broad objective

To assess the occupational safety and health status in the informal non-food manufacturing sector and identify interventions in Kampala City, Uganda.

1.3.2 Specific objectives

i) To describe occupational safety and health hazards in the informal non-food manufacturing sector in Kampala City.
ii) To assess the level of knowledge and attitudes on occupational safety and health practices in the informal non-food manufacturing sector in Kampala City.
iii) To determine the factors affecting occupational safety and health practices in the informal non-food manufacturing sector in Kampala City.
iv) To investigate the workplace legal and policy gaps of occupational safety and health in the informal non-food manufacturing sector in Uganda
v) To assess the compliance levels of good occupational safety and health practices among informal non-food manufacturing sector workers.

1.4 Research questions

i) What are the main types of occupational safety and health hazards in the informal non-food manufacturing sector in Kampala City?
ii) What are the levels of knowledge and attitudes on occupational safety and health practices in the informal non-food manufacturing sector in Kampala City?

iii) What are the factors affecting occupational safety and health practices at workplaces in the informal non-food manufacturing sector.

iv) What are the workplace legal and policy gaps in occupational safety and health in the informal non-food manufacturing sector in Uganda?

v) What are the levels compliance of good occupational safety and health practices in the informal non-food manufacturing sector workers?

1.5 Justification

The implementation of Uganda Vision 2040 may have an impact on the development of occupational safety and health for the country to become a middle income country by 2040. This is due to the emphasis on expansion of the manufacturing sector, modernization of agricultural sector and development of oil and gas sector. This may be even worse for Small and Medium Enterprises (SMEs) and informal sector being engines of economic development in Uganda. The implementation of Vision 2040 activities and associated hazards under increased pressure for economic development may be achieved at the expense of social protection and occupational safety and health. The collected data on occupational safety and health in the informal non-manufacturing in Kampala will be used to address Sustainable Development Goals (SDGs) 1, 3, 8 and 9 which focus on elimination of poverty partially through the promotion of economic opportunities for the poor, focusing on segments of the economy where most of the poor are active, namely, micro and small enterprises and those operating in the informal sector. These goals address; promotion of one's own health and protection of those around you; the protection of labour rights and promotion of safe and secure working environments for all workers and industry innovation, infrastructure through job creation and employment with standards and regulations for sustainability (Gaffney, 2011).

Understanding the existing occupational safety and health hazards and their predisposing factors in the informal sector is needed to inform occupational safety and health policy formulation and implementation to ensure improved safety and health of workers. The information may also benefit occupational safety and health policy makers, government regulatory agencies, employers and other occupational safety and health practitioners in Uganda for sustainable development and meeting the Sustainable Development Goals.

1.6 Scope of the study

The study was done in Kampala City's informal non-food manufacturing sector commonly referred to as "*Jua-kali"* sector. It was limited to seven sectors (manufacture of metal products, manufacture of furniture, textiles and clothing, recycling of paper and paper products, manufacture of bricks/ concrete products repair of machinery and equipment and other manufacturing) as identified in the Census of Business Establishment (COBE) report 2010/11 **(**UBOS, 2011**).** The target was the informal non-food manufacturing sector which carry out some form of manufacture and then sell, mainly because these sectors have sizable informal sector businesses and present high levels of workplace hazards. The study was restricted to establishments with less than five employees who make up the bulky of the informal non-food manufacturing sector in Uganda. The field work research took four months from May to August 2018.

1.7 Limitations

The study was done when Kampala City was evicting most of the informal sector enterprises especially on the streets due to complaints of overcrowding and poor sanitation. To streamline, maintain order and smooth management, Kampala City had given an order to all informal enterprises to vacate the city and register with the new project under Uganda Registration Bureau Services before they can operate. However, this limitation was ameliorated through the use of the newly organised groups in the Kampala City Department of Community Development which is mobilising the informal sector for a voice and financing. Some of the informal non-food manufacturing sector enterprises were not willing to participate in the study due to the suspicion of paying government taxes. This limitation was also mitigated through proper introduction of the objectives of the study to the respondents.

1.8 Assumptions

i) The eviction of the informal sector enterprises would not continue in Kampala City during the study period.

ii) The political stability of the country remained at the same pace to encourage the growth of the sector; Kampala City policies are more focused on supporting the growth than eviction of the informal non-food manufacturing sector from the city

iii) The socio-cultural practices of getting informal sector goods and services by the city residents do not change during the study period.

1.9 Operational definitions of terms

Adequate occupational health and safety: refers to a situation of appropriate knowledge, skills and practices to manage occupational health and safety at work.

Attitudes: refers to an individual's predisposed state of mind regarding value, precipitated through a responsive positive or negative expression towards a person, place, thing, or event which in turn influences the individual's thought and action positively or negatively at workplaces.

Housekeeping: refers to keeping the workplace clean and organized.

Informal worker: Self- employed or small business person not subject to regulation and taxation. People can be informally employed in the formal sector and formally employed in the informal sector.

Industrial hygiene: refers to the recognition, measurement and control of workplace hazards.

Inadequate occupational safety and health: lack of appropriate knowledge, skills and practices of occupational safety and health.

***Jua-kali*:** Kiswahili word referring to "open air" businesses.

Knowledge: refers to the familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions, or skills which are acquired through experience or education by perceiving, discovering, or learning and training by workers through induction, awareness, coaching, toolbox talks to avoid incidents and accidents for the case of occupational safety and health.

Major injury/ ill health: Includes fracture (other than finger or toe amputations, loss of sight, burn or penetrating injury to the eye, resulting in unconsciousness, requiring resuscitation or requiring admittance to hospital for more than twenty four hours.

National Occupational Safety and Health System: refers to the necessary infrastructure which provides the main framework for implementing the main national occupational safety and health policy and programs.

National Occupational Safety and Health Policy: refers to the national policy on occupational safety and health and the working environment developed in accordance with the principles of Article 4 of the Occupational Safety and Health Convention, 1981 (No.155).

National preventative safety and health culture: a culture in which the right to a safe and health working environment is respected at all levels, where government, employers and workers actively participate in securing a safe and health working environment through a system of defined rights, responsibilities and duties, and where the principle of prevention is accorded the highest priority.

Informal non-food manufacturing sector: These include small manufacturing enterprises, small traders and service providers with legal and illegal activities and a wide array of artisans engaged in activities such as agriculture, textiles, construction, auto repair, transport and arts and crafts.

Occupational: Related to job or profession.

Occupational accident: An occurrence arising out of or in the course of work which results in a fatal or non-fatal injury, e.g. a fall from height or contact from a moving machinery.

Occupational hazard: Something unpleasant that you may suffer or experience as a result of doing your job or hobby.

Occupation Safety and Health Management System (OSHMS): A set of interrelated or interacting elements to establish occupational safety and health policy and objectives, and to achieve those objectives.

Personal Protective Equipment (PPE): Use of worker-specialized clothing or equipment worn by employees for protection against safety and health hazards, designed to protect body parts like eyes, ears, face, feet, head and hands.

Occupational safety and health (OSH) practices: Refers to occupational safety and health actions or habits at the workplaces to keep employees, plant and environment safe such constant use of PPE, observing workshop rules and adhering to workplace safety culture.

Safety: The protection of people from physical injury or harm.

Unsafe act: Refers to human actions, omissions, violations or incidences which result into accidents at workplaces.

Welfare: Statutory procedure or social effort in form of amnesties designed to promote the basic physical and material well-being of people in need. This may include; sanitary conveniences, resting facilities, safe drinking water and cloakrooms.

CHAPTER TWO
LITERATURE REVIEW

2.1 The concept of the informal sector and occupational safety

The informal sector is an engine of growth with more than one billion workers in developing countries and 1.8 billion people globally, accounting for a greater portion of GDP (25-60%) in developing countries and less than 5% in high income countries. It is a major force in Asia, Africa and Latin America. Data from the World Bank, OECD and ILO show; East and South Asia with 1.26 billion informal workers (67% of the workforce), Latin America with 178 million informal workers (63% of the workforce) and Sub Saharan Africa with 152 million informal workers (45% of the workforce) (Marten, 2013).

Informal employment represents more than a half of non-agricultural employment in most developing regions, contributes to the overall economy and provides pathways to reduction of poverty and inequality. The International Conference of Labour Statisticians (ICLS) define the informal sector as employment and production that takes place in unincorporated and /or unregistered enterprises, and in most cases without social protection (Chen, 2016). The informal sector activities take place in open yards, undeveloped urban plots, or street pavements and road reserves (Mogane *et al.,* 2013).

According to Kongtip, Nankongnab, Chaikittiporn, Laohandomchok, Woskie and Slatin (2015), informal workers do not have legally protected job security, fair wages, or legally mandated occupational safety and health programs at work. 'Employees and entrepreneurs have been termed informal because of one chief characteristic: "They are not recognized or protected under the legal and regulatory frameworks of national governments''. The informal sector encompasses a range of economic units in urban areas that are mainly owned and operated by individuals, either alone or in partnership with family members of the same household and spans a range of sectors that include; handcrafts, leathercrafts, woodworks and carpentry, metal fabrication, electrical and electronics, ceramics and pottery, textiles and garments, printing and graphics, chemicals and pharmaceuticals, building materials and construction, food and beverages and agro processing amongst others (Chattopadhyay, 2005). In Kenya, the informal sector is renowned for employment. It includes the Jua-kali (open air) entrepreneurs, small traders, street vendors and hawkers, beach boys, door- to- door service providers (Karanja *et al.,* 2003).

Worldwide, the informal sector represents about 90% of the working population. This has been as a result of globalization which has facilitated the rapid increase in informal employment, and has been associated with the generation of employment that is often flexible, precarious and insecure (Lund *et al*., 2016). Typically, these informal sector units operate on a small-scale with low level of organisation and little or no division between labour and capital. They engage in the production of goods and services with the main objective of generating employment and basic income to the person concerned (ILO, 2002). Most of the micro-enterprises from the informal sector operate on open land or locations not legally recognised for the purpose and with no right of ownership. Thus municipal regulatory standards are not applicable to them. Therefore, as they do not own land, they cannot have access to sanitary facilities, permanent and suitable working environments, access to potable water and electricity as these are services provided to landowners. Existing occupational safety and health regulations do not cover them (Chattopadhyay, 2005). According to ILO (2000) safety and health issues are hardly considered, work accidents are rarely reported and compensated. The sector is "informal'' due to the fact that the economic units are unregulated and unrecorded in official statistics (ILO, 2000).

According to Burton (2010), the African informal sector accounts for 75% of non-agricultural workforce that work informally. The informal sector has a non-regulated labour market which usually involves workers without written arrangements with the employer undocumented by government records. Alfers *et al.* (2012) state that many informal jobs are not only "flexible, precarious and insecure but also hazardous and take place in settings that are unhealthy and unsafe". Informal sector workers operate in inhumane conditions and makeshift places without sanitary facilities. Such work environments can include; road reserves, informal market places, wetlands / marginal lands and poorly serviced homes, all of which can expose workers to environmental hazards, disease, traffic accidents, fire hazards, crime, assault as well as weather related discomfort and muscular-skeletal injuries.

An occupational hazard is something unpleasant that you may suffer or experience as a result of doing work or hobby (Valentic *et al*., 2005). Occupational hazards are inherent properties of substances, agents, sources of energy, or situations that have the potential of causing undesirable consequences while risk is the probability that damage to life, health and or the environment may occur from the hazard. Occupational safety is the control of hazards in the workplace to achieve an acceptable level of risk, while workplace safety generally

refers to the process of protecting the safety and health of staff while on the job, irrespective of vocation (Aluko *et al.*, 2016). Occupational hazards exist in every workplace in many unusual forms that may include; pointed edges, falling objects, flying sparks, chemicals, dust, fumes, noise and numerous potential hazardous situations (Amir *et al.*, 2017). The US Occupational Safety and Health Administration (US OSHA, 1970), requires that employers protect their workers from workplace hazards that can cause damage to them.

2.2 Occupational safety and health status globally

In 1995, the ILO and WHO provided a broad definition of the occupational safety and health concept. "Occupational safety and health should aim at: the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers of all occupations; the prevention amongst workers' departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; placing and maintenance of workers in an occupational environment adapted to their physiological and psychological capacities, and to summarise the adaptation of work to man and each man to his job (Alli, 2009). The understanding of the concept shows a comprehensive emphasis on individual worker's physical, mental and social wellbeing, general health and development which marks a shift from the previous mono-disciplinary risk oriented conceptualisation. Occupational safety and health management therefore protects the safety, health and welfare of people at their workplaces. It also focusses on the maintenance and promotion of workers' health and capacity to workers' improvement of the working environment and the work to become conducive to safety and health, development of work organization and working cultures in a direction which supports safety and health at work and in so doing promotes a positive social climate and smooth operation and may enhance productivity of the undertaking (Stellman, 1998).

Globally, work related accidents result in an annual 4% loss of the world's GDP, about US$ 2.8 trillion in direct and indirect costs. Fatal diseases account for 85% of all work-related fatalities but only half of the countries provide official statistics for occupational diseases. Underreporting, public ignorance, lack of treatment and compensation, low resources for occupational safety and health improvement and collection of data (cycle of neglect) are the main gaps (ILO, 2014). Workplace hazards continue to exert a large charge in terms of morbidity, mortality, financial and social costs, which provide justification for the ongoing national commitment to protection of the health of the workforce (Schlaich *et al.*,

2009; Amir *et al*., 2017). According to ILO (2013a), the 21st Century worker continues to be exposed to numerous physical, chemical, biological, ergonomic and psychological hazards. Occupational accidents and work-related injuries cause a great deal of human suffering and loss in the world of work. ILO further estimates that 234 million people die each year from work-related accidents and diseases. As many as 317 million non-fatal accidents occur and 160 million non-fatal work related diseases emerge annually. Despite this alarming situation, only 5-10% of the workforce in developing countries has access to some kind of occupational safety and health services (Zewdie, Dangnew and Takele, 2011).

In the UK, the Health and Safety Executive (2004), reports that about 40 million working days are lost annually through work-related injuries and ill health at a cost of £ 2.5 billion to business. In the US Private Sector alone, workplace injuries and illnesses occur at a rate of 4.6 cases per 1000 fulltime workers with an estimated cost of US$ 326 billion to the US society - a sum that includes lost wages, lost productivity, health care expenses and other costs. Injuries and other occupational problems like exhaustion and poor health go relatively unreported, yet undoubtedly decrease the quality of working life of the workers (Linda, 2009).

In Iran, studies have shown high levels of occupational injuries among workers, 122.8 cases per 1000 in the Automobile manufacturing industry (Nasiri, Yarahmadi, Gholami, Hamidi and Mirkazemi, 2015). This is contrary to Karimlou, Salehi, Imani, Hosseini, Dehnad, Vahabi and Bakhtiyari (2015), who state that the rate of work-related accidents insured by the Iran Social Security Organisation (ISSO) was 3.3 per 1000 between 2001-2005, compared to between 2-8 per 100,000 in European countries in 2007. However, the prevalence of work-related injuries according to the study was likely to be the result of different working conditions, safety precautions and safety policies. The study further found out that work-related accidents were a result of multiple factors including individual behaviour, environmental factors and workplace conditions, while low education, lack of experience, boldness and recklessness contribute to work-related accidents in young people. Education and prevention were suggested to pave the ground for effective ways of reducing the number of work-related accidents and their consequences to Iran.

According to Alli (2009), in Sub Saharan Africa, the fatality rate per 100,000 workers is 21 and the accident rate is 16,000. This means that each year 54,000 workers die and 42

million worker related accidents occur that cause at least three days' absence from work. The economic costs of these injuries and deaths are colossal at enterprise, national and global levels. Taking into account compensation, lost working time, interruption of production, training and retraining, medical expenses and so on.

In Uganda, the Auditor General reports that 1,520 people were injured between 2006 and 2008 while 856 workers contracted occupational diseases in 2007, and 40 buildings collapsed injuring many workers (GoU, 2016a). The Auditor General further states that compliance to occupational safety and health in Uganda stands at only 30% in the private sector whereas in government institutions it is at 45%. Data on compliance is unavailable in the informal sector but it is highly anticipated to be very low. Of the one million workplaces in the country, only 0.1% of the formal workplaces have been registered and the Department of Safety and Health does not have an up to date database relating to occupational accidents, injuries and diseases in Uganda.

2. 3 Occupational safety and health hazards in the informal sector

All workplaces have unlimited hazards that can affect workers, caused by obvious unsafe acts resulting from the behaviour of workers themselves, unsafe conditions such as unguarded machinery, slippery floors, poorly lighted and ventilated premises, lack of fire precautions to mention but a few. Poor work environments, unhealthy life style, work-related exposures and demographic factors influence workers health. The informal sector is characterised by poor working conditions and high exposure to hazardous substances. Poor work organization, poor access to clean water and sanitation, ergonomic hazards, strenuous hand tools, exposure to dust and chemicals are major risk factors identified in the African informal sector (Nag, Vyas and Nag, 2016).

The informal sector worldwide is notorious for having unsafe working conditions, poor health standards and pervasive environmental and occupational hazards (Basu, et *al.*, 2016). Informal employment is associated with increased levels of illness and injury because informal workers are exposed to greater health risk due to poor work or occupation-related conditions as compared to formally employed workers. Many workplaces are unsafe– resulting in illness and injury; nearly half of all wage workers in Bangladesh and Latin America reported unsafe workplace conditions, while more than 60% of the informal women workers in India reported physical weakness due to poor working and living conditions and

in South Africa, the incidence of work injury was 7.2 times higher in the informal versus formal sector in the Philippines, more than 50% of non-fatal injuries are incurred by self-employed informal workers (Marten, 2013).

Evidence from Bangladesh (Tulchinsky, *et al*., 2014), showed that over 370 clothing workers were burnt to death in a grossly unsafe and locked premises, which highlight some of the dangers of globalised industry and occupational health amidst poverty and poor safety measures in developing countries. According to the National Programme for the Control and Treatment of Occupational Diseases in India (2003), there were 100 million occupational injuries in India alone causing 10,000 deaths. It is also estimated that in India, 17 million occupational non-fatal injuries (17%) of the world total) and 45,000 fatal injuries (45%) of the world total deaths) are due to occupational injuries. Occupational hazards contribute 2.3% of Disability Adjusted Years (DALY) lost among the middle income countries and of this, welding contributes a sufficient percentage in the developing world like India (Nihfw, 2009). In spite of being a major public health problem existing among welders, very few studies have been conducted to assess the pattern, types of injuries and their associated risk factors at a global level (Kumar and Dharanipriya, 2014).

In a Gaborone, Botswana study (Buhlebenkosi, Sibanda, Chaurura and Chiwira, 2013), perceived problems in urban informal sector were a result of lack of safety induction, lack of standard procedures on how to deal with accidents/emergencies, lack of area demarcation, inadequate personal protective equipment and poor waste management. The study also noted during the walk through surveys the lack of proper housekeeping in the workplaces, old and unguarded equipment, lack of control of children and tenants and lack of adequate PPE. The study however, covered only two sectors of the informal sector, carpentry and mechanics.

Due to the limitations in national data collection systems in many countries, there are no consistent global figures for work-related injuries and diseases and although occupational safety and health research attempts have been made, little has been given to small and medium enterprises and the informal sector (Puplampu, 2012). In addition to underreporting, common and official reporting requirements which are guided by work related diseases as the main cause are not met. According to ILO, data on occupational safety and health remain scanty in most Sub- Saharan countries (ILO, 2014).

The potential for harm to develop from the hardware or operating environment may involve among other things; mechanical, structural and process design failures and confined space; dangerous goods and hazardous substances; sources of ignition; materials handling and storage; access and egress; electrical hazards and moving vehicles and equipment such as forklifts. On the other interface between physical workplace and the people component lie the ergonomic hazards that include; noise, vibration, glare, unguarded machinery, workstation design, slippery surfaces, manual handling issues and poor amneties. Hazards originating from interactions between the external physical environment and physical workplace may be related to climate and ultraviolet radiation for the case of outdoor workers (Makin *et al*., 2008). The authors, further noted that hazards may be generated within the 'people' section of the organization not only from the individuals themselves but also from the way people relate to others or as a result of interactions between people and the workplace, management and physical workplace and the external environment. These particular hazards may stem from singular or combined psychological, biological or socio- cultural factors e.g. discrimination, bullying, horseplay, practical jokes or initiation rites (Cowi, Naylor, Rivers, Smith and Pereira 2002; Djurkovic, McCormack and Casimir, 2004). Other hazards are between workers and management strategies and methods of work such as stress, fatigue from shift work, or overtime momentous tasks or pace of production (LaDou and Coleman, 1998).

Small scale enterprises use obsolete production methods and substitute raw materials of inferior quality, exposed to multiple hazards especially in cluster zones due to excessive numbers of both people and products in workplace. There is frequent lack of PPE as well as poor housekeeping of the small workplaces. There is also lack of welfare facilities and services in the workplace. Sanitary facilities are non-existent at roadside and open air enterprises. Premises are makeshift and most workers are exposed to all types of harsh weather. For those working in proper buildings, the workplaces are not designed to be workplaces and often do not have adequate facilities. Lack of firefighting appliances means that a number of fire outbreaks are high (Karanja *et al*., 2003).

According to Goetsch (2011), environmental stressors on which industrial hygiene focuses can be divided into four broad categories: physical, chemical, biological and ergonomical hazards. The author further states that typical chemical hazards include; mists, vapours, gases, dusts and fumes while physical hazards include noise, vibration, extreme

temperatures and excessive radiation (electromagnetic or ionising). Biological hazards come from moulds, fungi, bacteria and insects which may be introduced to the workplace through sewage, food waste, water or insect droppings/infestation. Ergonomic hazards are related to the design and condition of the workplace. Poorly designed tools and workstations are ergonomic hazards. Similarly, Mock, Adei, Acheampong, Deroo and Simpson (2005), classified hazards into; fire, chemical, physical; biological, mechanical, ergonomical and psychological categories.

According to Theuri (2012), majority of informal workers in Kenya live in slums and lack basic health and welfare services. They work in unhealthy and unsafe work environments. For most informal sector operators, their home and workplace are one and the same place. Vulnerability to disease and poor health result from a combination of undesirable living conditions. The conditions under which most informal workers operate are precarious and unsafe. Many operate in ram-shackled structures, lack sanitary facilities, portable water and poor waste disposal. In a similar sector in Tanzania, Ngowi (2013) states that workers were exposed to numerous health and safety hazards which are physical, chemical, biological, mechanical, ergonomic or psychological. The author further states that workers view hazards as part of their life and at times take no precautions to prevent them. This fatalism may be dismissed due to lack of information and ignorance or superstition, as the case with the informal sector.

2.3.1 Fire outbreaks

Fires are the most rampant and prominent safety and health hazards faced by the informal sector, mainly associated with traders in markets and garages. According to Lund *et al.* (2016), a fire in the Kumasi Central Market, Ghana destroyed more than 400 stalls containing cash and goods for traders. Causes of fires are electrical incidents, unattended charcoal stoves left behind and suspected arson activities. A study by Mogane *et al.* (2013), established that most of the informal establishments are poorly located, cannot be easily accessed by fire fighters and most of them do not have fire hydrants and extinguishers to quickly control the fire outbreaks. Lack of firefighting appliances means that a number of fire outbreaks cannot be controlled.

2.3.2. Poor sanitation

According to Mogane *et al*. (2013), most of the informal sector establishments are located in makeshift structures, open spaces, road reserves, wetlands/ marginal lands and poorly planned premises which do not have toilets, running water, means of solid waste disposal and blocked drainage systems. These provide breeding places for vectors and produce intolerable stench to workers. Sanitation facilities are non-existent at roadside and open air enterprises. Workers near rivers face additional problems of mosquito bites, malaria fever and poorly lit and ventilated workplaces. Karanja *et al*. (2003) states that poor maintenance of ablution facilities and unhygienic water accumulation on the floor, overflowing waste bins lead to possible exposure of hazardous biological agents and nuisance smells from blocked storm drainage systems.

2.3.3. Physical hazards

According to Ametepeh, Adei and Arlin (2013), physical hazards are risks affecting physical safety. They arise primarily from sources such as; noise, vibration, fire, poor sanitation, radiation and extreme temperatures. In mechanical workshops, heavy industrial and manufacturing environments, noise, vibration, ionising and non-ionising radiation can affect health of workers adversely. About 10 - 30% of the workforce in developed countries and up to 80% in the developing countries are exposed to noise. Noise induced hearing loss is one of the most prevalent occupational health effect in garages and metal workshops. According to Amedofu (2002), the acceptable level of noise which is harmless is 85dBA. Therefore, it is necessary to control noise by use of ear plugs and ensure that workers are not exposed for long working hours. Traders in the informal sectors are exposed to physical hazards including thermal and cold stresses, noise, vibration and ultra violet radiation. Those in panel beating and spray painting, carpentry, aluminium and steel workshops, and upholstery industries are exposed to high levels of noise and hand-arm vibration, while the traders from central business districts are exposed to continuous background noise from traffic and other activities (Mogane *et al*., 2013).

Emissions of fumes and particulates are a major potential problem for employees working with molten metals, making and handling coke, and charging and tapping furnaces. They are also troublesome to workers assigned to equipment maintenance, duct cleaning and refractory wrecking operations. Health effects are related to the size of the particles (the proportion that are respirable) and the metals and aerosols that may be adsorbed on their

surfaces. There is evidence that exposure to irritant dust and fumes may also make steelworkers more susceptible to reversible narrowing of the airways (asthma) which, over time, may become permanent (Woolf , Johnson, Philip and Phillipsen, 2007).

2.3.4 Mechanical hazards

Mechanical hazards are hazards associated with power-driven machines, whether automated or manually operated. In spite of the advances in safeguarding technologies and techniques, mechanical hazards are still a major concern today. In an industrial setting, people interact with machines that are designed to drill, cut, shear, punch, chip, staple, stitch, shape, stamp, slit such materials like; metals, plastics and elastomers. If appropriate safeguards are not in place or if workers fail to follow safety precautions these machines can apply the same procedures on them and can result into mechanical injuries. According to Goetsch (2011), common mechanical injuries include cutting, tearing, shearing, crushing, breaking, straining, punching and many others. The author further says that all mechanical hazards can be reduced by the application of appropriate safeguards. Machine safeguarding minimise the risk of accidents of the machine operator contact. The contact can be individual making contact with the machine usually the moving part because of inattention caused by the fatigue, distraction, curiosity or deliberate chance taking; from the machine via flying metal chips, chemical and hot metal splashes and circular saw kickbacks to mention but a few; and the direct result of machine malfunction including mechanical and electrical failure.

2.3.5 Chemical hazards

More than 100,000 different chemical products are being used in modern workplaces and the number is growing (Smartname, 2011). Chemical hazards typically arise from liquids, solids and gases (dusts, fumes and vapours) which may cause adverse health effects on workers' health. Some of the poisonous chemicals used in the informal sector include; paint additives, gasoline, isocyanides and other volatile organic compounds (Ametepeh *et al.*, 2013). Heavy exposures to chemical hazards are most prevalent in industries that use, make and process metals and paints in the manufacture of consumer goods, production of textiles, artificial fibres and cleaning industries. According to Mogane *et al.* (2013), traders are exposed to a range of Hazardous Chemical Substances (HCS) including both commercial and those that are created through improvisation. Strong smell of paint vapours, paint removers and thinners are noted during mixing and spraying.

In a similar study by Spies (2008), spray painting workers were found to be exposed to high concentrations of isocyanides fumes from paraffin and liquid petroleum gas used for cooking in kitchens, which result into indoor pollution. WHO (2004), states that drivers are mostly exposed to diesel fuels with carcinogenic properties and exhaust emissions from the total vehicle fleet also containing pollutants such as carbon dioxide, nitrogen oxides and sulphur dioxides all of which can damage the respiratory system. Exposure to welding fumes that are a complex mixture of hazardous chemical substances were noted in the welding industry. In car, mechanic and upholstery industries, workers are exposed to oil and grease. While in the aluminium and glass works, workers may be exposed to aluminium, copper and glass dust released during cutting operations. Cobblers and carpenters are exposed to leather and wool dust (Spies, 2008).

2.3.6 Ergonomic hazards

Ergonomic hazards result from the nature of work and its organization. They relate to how the workplace, equipment used and work environment itself contribute adversely to comfort, efficiency, safety and productivity (Ross, 1994; Hagberg, Silverstein, Wells, Smith, Hendrick, Carayon and Pirusse, 1995). According to Goetsch (2011), the proliferation of uncomfortable and dangerous conditions whether created by job designs or unfriendly technologies are widely recognised as harmful productivity to worker safety and health. Minimising the amount of physical stress in the workplace requires continuous study of the ways in which people and technology interact. The insight learned from this study can be used to improve the interaction. Common factors that influence the amount of physical stress associated with the job include; sitting, standing, demand for strength/ power, work area, type of motion, amount of surface contact and environmental factors. Poor workplace design, awkward body mechanics or postures, repetitive movements and other ergonomic hazards induce or contribute to staggering number of cumulative musculo-skeletal trauma (Ross, 1994; Westgaard and Winkel, 1997).

In a study by Ametepeh *et al*. (2013), poor posture was identified as the commonest ergonomic hazard. According to Whitelegg (1995), drivers are the most affected people complaining of discomfort due to posture. Sitting in the driving position exerts considerable force on the spine and can cause a number of problems with the musculo-skeletal system particularly backache, neck problems, pulled muscle and general stiffness. The authors further state that approximately 30% of the workforce in developed countries and between

50-70% in the developing world are exposed to heavy physical workloads or ergonomically poor working conditions, involving lifting and moving heavy loads or repetitive manual tasks which can lead to injuries and musculo-skeletal disorders. According to Mogane *et al*. (2013), working in awkward positions as a result of poor working station designs was observed in traders lifting heavy loads and at times over long distances. Many workers do not have seats or use non-ergonomically designed chairs.

2.3.7 Psychological hazards

Psychological hazards are defined as those aspects of work design, organization and management of work and their social and environmental context, that have the potential for causing psychological, social or physical harm. They have been identified as being among the major contemporary challenges for occupational safety and health today, they are linked to work-related stress, violence and bullying (Goetsch, 2011). In the European Union, work-related stress affects more than 40 million people and costs at least Euro 20 billion per year in lost time and health bills (Leka, 2010).

Poor working conditions do not only have physical effects but also have psychological repercussions too, which usually result into social and mental problems (Ametepeh *et al.*, 2013). According to Ndejjo *et al.* (2015), long working hours result in prolonged exposure to hazards and limited recovery time which translate into physiological depletion that continues the following day. Stress can cause fatigue and have negative effects on productivity, quality of work and personal safety and health (Jill, 1997). According to the Organization of African Trade Union Unity (OATUU, 2000), psychosocial hazards cause fatigue, stress, burnout and general loss of interest in work. Monotonous work which requires constant concentration, irregular working hours and working in violent situations can cause adverse psychological effects to workers. The lack of adequate job security and presence of unscrupulous investors decrease the sense of physical security felt by workers. Some conditions that informal traders tolerate include violence by customers as a result of the latter being dissatisfied with the quality of the product, theft and occasional confiscation of their products by government officials. According to Nabirye (2016), stress and lack of job satisfaction puts patients and clients at risk as nurses may make more mistakes while executing their duties.

According to the National Occupational Safety and Health Profile (GoU, 2004), the hazards to which workers are exposed to in Uganda are not adequately documented, it

contents that in terms of statistics, there is very little collected. To date, 14 years since the last report in 2004, no other National Safety and Health Profile has been produced.

2.4 Occupational safety and health knowledge, attitudes and practices at work

Studies conducted during the 1990s suggested that the practice of occupational safety and health in small firms and the informal sector was non-existent largely due to illiteracy and lack of knowledge of occupational safety and health (Tornberg, Forastieri and Rima, 1996; Loewensen, 1997). Recent and more systematic knowledge, attitudes and practice (KAP) studies reviewed show a consistent divergence between employers and workers' knowledge of occupational safety and health hazards in small scale enterprises and informal sector (Eakin, Champoux and Maccachen, 2017). In a similar study in Dar es Salaam, (Rongo, 2005), awareness of ergonomic principles in small industries was found to be at a very low level of awareness of major areas of ergonomic hazards, even though the owners had received vocational training. In Manduria, India, Parimalam, Kamalamma and Ganguli (2007) investigating the ergonomic conditions found out that work environment was not generally unhealthy and unsafe but poorly designed sewing stations were used and firms could not afford height adjustable sewing tables and chairs. The study also found out that in cases where these were available workers and even the owners were neither aware that machine tables were height adjustable nor knew how to use them. The consequences were that workers suffered from injuries, neural problems, dermatological, respiratory and musculoskeletal disorders such as low back and neck pain. In another study, Niftrik, Reijnierse, Bogaard and Lumens (2003), workers engaged in garment manufacturing sectors had high knowledge of safety and health problems related to their occupation, good knowledge of the importance of using Personal Protective Equipment (PPE) and their benefits but a few workers demonstrated compliance to such measures.

Champoux and Brun (2003), found out that although managers felt they knew more about hazards and risks in the work place, safety audits revealed extremely hazardous workplaces. It was noted that occupational safety and health practice is not a priority for these firms and knowledge may not always translate into effective practice of occupational safety and health, other factors such as infrequency of accidents and lack of economic incentives to invest in safety and health may explain. A study in a small scale industry in Sheffield, UK (Bradshaw, Fishwick, Curran and Eskin, 2001), workers were provided with personal protective equipment but these were not used, thus raising the problem of education in the

workplace. Small businesses do not consider safety and health a priority. This suggests that safety practice does not depend on knowledge and attitudes alone but is positively associated with being informed about safety precautions and being supplied with safety gear coupled with adequate and proper supervision. Studies in the informal sector on knowledge, attitudes and practices have not been done, particularly in developing countries' informal non-food manufacturing sector to compare the circumstances. In Uganda no documented studies have been able to address the informal sector as it has just emerged as a result political stability.

2.5 Policy, legal and institutional frameworks for occupational safety and health

The right to decent, safe and healthy working conditions and environment has been a central focus for ILO since the 1944 Declaration in Philadelphia about Social Justice for Fair Globalisation. In addressing occupational safety and health at workplaces, Convention No. 155 (ILO, 1981a), sets out the basic principles and methodology required for improvement of occupational safety and health, while the 2002 Protocol complements and reinforces the requirements to collect relevant information to assess progress and Convention No. 187 (ILO, 2006) strengthens the requirement for promoting safe and healthy working environments. It details out the cyclical nature of national policy processes and how such policies and national programmes contribute to building and maintaining a preventative safety and health culture (ILO, 2006). Conventions No. 155 and 187, therefore, have a central role in achieving good occupational safety and health at workplaces.

The conventions require states signatory to them to have consultations with the most representative organisations of employers and workers to formulate, implement and periodically review coherent national policies on occupational safety and health and the working environment. Article 7 of the Convention No.155 (1981a), adds that the review shall be done with a view of identifying major problems, evolving effective methods for dealing with priorities for action. The policy requirement is thus a dynamic cyclic process requiring a periodical review to ensure that scientific and technological progress and changes in the working environments can be incorporated into the national policy. Calling for a national occupational safety and health policy emphasises that governments as main players must consider occupational safety and health as a matter of national concern and priority and can be actively involved (ILO, 1981a). These conventions are binding to all countries which ratify them and can benchmark good practices in occupational safety and health. However,

many developing countries have not developed national occupational safety and health policies to provide a basis and framework for preventive and corrective action.

A guide to Occupational Safety and Health Convention No. 155 (ILO, 1981a), stresses that countries which have not ratified the ILO Conventions on Occupational Safety and Health depend on local policies which are not benchmarked with international occupational safety and health norms. At national level states have to take appropriate measures to provide guidance to workers and employers to maintain an adequate system for inspection and audits. Different countries have customized the ILO regulations to suit their needs. ILO (2006), requires each ratifying member to formulate, implement and periodically review a coherent national policy to prevent accidents and injury to workers by minimizing workplace hazards. Similarly, it requires governments to take action at national and enterprise levels and also have adequate and appropriate system of inspection to make sure labour regulations especially to workplace safety are complied with. Hence the most effective interventions for improving occupational safety and health appear to be the top-down government regulation.

The occupational safety and health legislation places a duty of care on employers to achieve adequate occupational safety and health implementation through safe workplaces, safe systems of work and provision of PPE (Hughes and Ferrett, 2011). Under the ILO convention No. 155 (ILO, 1981b) workers are supposed to take reasonably practicable measures to protect themselves and others at work from risks arising from their actions and omissions at work, cooperate with the employer in achieving high standards of safety and health at work and under obligation to use personal protective clothing and equipment.

In the UK, the enactment of the Health and Safety at Work Act (HESAWA, 1974) led to the establishment of the Health and Safety Council (HSC) with it is Health and Safety Executive (HSE), an executive arm for the development of regulations and their enforcement. The management of safety and health is based on regulations and codes of practice. It places the onus of management on the employer rather than government. In the USA the main legislation is the Occupational Safety and Health Act (US OSHA, 1970) that manages occupational safety and health in the federal states. Elsewhere in Singapore, which has the lowest workplace accident rates, occupational safety and health is subjected to strict enforcement of safety standards, training of workers and safe work practices through Employment and Factories Act that aim to protect the safety and health of workers.

According to Bernardin, John and Russell (1993) and Wayne (1995), occupational safety and health authorities should conduct workplace inspections with competent occupational safety and health officers. Viscusi (1986); Gray and Scholz (1993) and Cliff (2012) concur that occupational safety and health regulation, characterised as being uniformly prescriptive with emphasis on detailed and highly technical specifications, standards and compliance to rules should be enforced by government funded independent inspectorates with broad powers. Cliff (2012), however, faults such rigid approaches as having a number of weaknesses, such as abstract and challenging rules, reduction in organizational innovativeness as compliance approach focused on minimum standards rather than excellence and little involvement of other stakeholders such as workers and trade unions. Administrative regulation does not necessarily increase workplace safety because the cause of accidents is a complex interaction of labour, equipment and work environment (Mendeloff, 1988).

Ndegwa *et al*. (2014), found out that occupational safety and health is dependent on occupational safety and health policies, laws, inspections and audits. The authors further confirm that the enactment of the Factories Act Cap. 514 (1951), saw the emergence of occupational safety and health programmes in Kenya while with the enactment of the Occupational Safety and Health Act (OSHA, 2007), many workplaces which had hitherto operated without institutional and individual capacity for safety and health management had to develop requisite mechanisms in order to improve the safety of working environment and escape liabilities. The Kenyan Occupational Safety and Health System has put in place the National Occupational Safety and Health Policy, five year Plan of Action, Regulations, Competent Authority for occupational safety and health and a number of Training Institutions among others (ILO, 2013b). However, the informal sector is unregulated and rarely inspected by government officials, the employers may not be conversant with their responsibilities and the ignorance of workers about occupational safety and health hazards, their entitlements and expectations.

2.6 Legal framework and mandate for occupational safety and health in Uganda

According to the National Safety and Health Profile 2004 (GoU, 2004), Uganda has an old but straight forward legislation on safety and health. The legal framework for occupational safety and health in Uganda is fragmented and can be traced through the Constitution of Uganda (1995), Children's Act Cap 59, Employment Act Cap 219 (2006), Factory's Act (2000) and OSH Act (2006) of the Laws of Uganda. The parent legislation is

the Constitution of Uganda which has several articles referring to decent work. Articles 25(1 and 2) state that no person shall be held in slavery or servitude and no person shall be required to perform forced labour respectively. Article 39 states that every person has a right to a clean and health environment while article 40 (3) states that every worker has a right to join a trade union and allows for collective bargaining. Articles 39 and 40 are therefore key for occupational safety and health management in all economic sectors in the country.

The principle law for Occupational safety and health in Uganda is the Occupational Safety and Health Act (OSHA, 2006) and it is subsidiary legislation. According to the Auditor General's Report (GoU, 2016a), the OSH Act 2006 was enacted to provide for the right of persons / workers to work under satisfactory, safe and healthy conditions. Part III provides for general duties, obligations and responsibilities of employers specifically to; protect workers, provide safety and health measures, consult with workers on safety issues, monitoring and control of dangerous substances, provision of protective gear and supervision of health workers. Part IV provides for general duties of employers and self-employed to protect other people, protect themselves and third parties, display of guidelines on safety precautions, provision of safe premises and control of pollutants in the workplace (OSH Act, 2006).

Part V of the OSH Act (2006) addresses duties, rights and responsibilities of workers specifically to; report dangerous occurrences to immediate supervisor, right to move away from dangerous situations, no penalty for complying with this Act and reckless or intentional interference with safety measures and Part VIII is on Health and Welfare - specifically; safe working environment, suitable lighting, adequate whole some water, adequate washing facilities, cloakrooms, sitting down facilities, meal facilities and First aid at workplace. Part XI provides for machinery, plant and equipment specifically the; fencing of dangerous machinery and plant, efficient control of power, safe use of driving belts, unfenced machinery self-acting machines and lifting gear and lastly Part XIII on hazardous materials in handling of hazards, electrical apparatus, toxic materials, drenching facilities for emergency cases, work in confined spaces, lifting of heavy loads, exposure to ionising radiation, provision of personal protective equipment, protection of eyes and supervision in certain processes.

Although the OSH Act (2006) under Section 119 empowers the Minister to make regulations with the approval of Parliament for the implementation of the OSH Act (2006),

this has not been possible due lack of effective mechanisms of the Act implementation. To date, no regulations have been enacted in the various economic sectors to guide implementation of occupational safety and health in the formal sector, probably due to lack of a national policy and strategy save only for the Ministry of Energy which has enacted a number of regulations; The Electricity (Safety Code) Regulations (2003a), Petroleum (Waste Management) Regulations (2016b), Petroleum (Refining, Conversion, Transmission and Midstream storage (Health, Safety and Environment) Regulations (2016c) and National Environment Management Authority (NEMA) which has enacted regulations on noise (Noise Standards and Control Regulations (2003b) and Wastes Management Regulations (1999). These regulations are however, enforced by the Ministry of Energy and Mineral Development and NEMA respectively but not the Department of Occupational Safety and Health of the Ministry of Gender, Labour and Social Development. This state of affairs is likely to bring confusion in the country as to who is the regulatory authority for occupational safety and health in Uganda.

Uganda is a member to the ILO and has ratified a number of ILO Conventions. However, the country has not ratified some of the key ILO Conventions that govern occupational safety and health management. Among these are; the ILO Conventions No. 155 (Occupational Safety and Health), No. 185 (Construction Safety), and No. 170 (Chemical Safety). The ILO Conventions are international agreements that have a legal force if ratified by Member States. Occupational Safety and Health Convention No. 161 requires states to establish and maintain a safe and health working environment which facilitates optimal physical and mental health in relation to work including the obligation to develop occupational health services for all workers.

2.6.1 History of the Ugandan Department of Occupational Safety and Health

The origin of the Department of Occupational Safety and Health in Uganda is traceable back to 1952 when the then Factories Inspectorate Section in the department of labour was established with 3 inspectors. It later developed into a fully-fledged department headed by a commissioner. The Inspectors derived their powers from the Factories Ordinance of 1952. Their roles were to ensure safety and health of workers in the factories. A wide ordinance's scope came into force later (1952 Ordinance) and remained till 1964. With minor amendments at Uganda's independence in 1964, the ordinance became the Factories Act

under it is subsidiary legislation Cap 198 of the Laws of Uganda, currently the Factories Act Cap 220 Laws of Uganda.

In 1964, a sister section called the "Occupational Health and Hygiene" was introduced to focus on occupational health and hygiene in all workplaces and not just factories. The section later became a department and headed by the commissioner. During the Civil Service Reform Exercise in 1994 the two departments of Factories Inspection and Occupational Health and Hygiene were merged into the current Occupational Safety and Health Department now under the Ministry of Gender, Labour and Social Development (GoU, 2004). It is objectives among others include; to minimize occupational accidents, diseases and injuries at workplaces, promote good health of the worker at the workplace, promote good working conditions, promote construction of safe and healthy workplaces, promote awareness of occupational safety and health among workers and training of employers and the general public (GoU, 2016a).

2.6.2 Department of Occupational Safety and Health mandate

In ensuring enforcement of occupational safety and health at workplaces, the Department of Occupational Safety and Health (DOSH) carries out a number activities; developing/ reviewing occupational safety and health policy, laws, regulations, technical standards, strategy, guidelines, codes of conduct and manuals; registering all workplaces in the country; conducting general and statutory inspection of workplaces and equipment/ statutory machinery certification; educating and creating awareness about occupational safety and health among employers and employees; reviewing and approving architectural drawings/ plans (water, electrical, civil and building works) of public, commercial and industrial workplaces to ensure that occupational safety and health requirements have been incorporated; monitoring, recording and interpreting statistical data of industrial accidents, diseases and health hazards; Undertaking investigations of occupational accidents and diseases; carrying out medical surveillance of workplaces, carrying out research on occupational hazards and disease and publishing reports (GoU, 2016a). These are the same activities outlined in the OSH Act (2006). These activities are however constrained by many challenges like inadequate staffing and budgets among others (National OSH Profile, 2004). Unfortunately, the department has no national OSH policy despite it being one of the activities under the OSH Act (2006).

In comparison to Kenya, OSH is at higher level under the Directorate of Occupational Safety and Health Services (DOSHS), in the Ministry of Labour and Human Resource Development and almost has similar activities. It is mandated with the responsibility of ensuring that employers provide preventive measures for accidents and diseases. It undertakes systematic inspections and audits of workplaces with the view of identifying the hazards and make recommendations for improvement, creating awareness to citizens and other people on matters of occupational safety and health and processing compensation claims for injured employees during the course of employment (Ndegwa *et al*., 2014). Kenya has a National Safety and Health Policy (2012), five year strategic plan, an OSH Authority and National OSH Fund for the implementation, as well as the decentralisation of OSH services to county level governments (ILO, 2013).

2.6.3 Organizational structure of the Ugandan Department of Occupational Safety and Health

The organizational structure of the Department of Occupational Safety and Health provides for a total of 47 staff (38 technical and 9 support staff). The Department has two divisions; Safety Division and Health Division. During the financial year 2015/16, the department had twenty two staff, 18 of whom were qualified Inspectors in the fields of Health, Engineering, Environment, Chemistry, Hygiene, Food Science, and 4 administrative support staff. The Department is headed by the Commissioner in charge of Occupational Safety and Health who reports to the Director, Labour, Employment and Occupational Safety and Health. The department is assisted by two Assistant Commissioners; Occupational Health and Occupational Safety with three Principal Safety Inspectors. These cover the whole country of 112 districts of Uganda.

2.6.4 Funding occupational safety and health activities

Unlike in Kenya where funding of occupational safety and health is decentralised at County Governments and funded through the National Occupational Safety and Health Fund (ILO, 2014), in Uganda, Department of Occupational Safety and Health activities are financed solely by Government. Enhanced external funding was secured by the Ministry to Government in order to pursue it is major function of effective enforcement through the project "Strengthening Safeguards, Safety and Health at Workplaces (SSASHEW)". The department received only US$ 2,128,857 during the three years 2015/2016 under review (GoU, 2016a).

However, according to the Auditor General's Report (GoU, 2016a), despite the existence of the OSH Act 2006, many workers in Uganda are not aware of their rights to a safe and healthy working environment and have remained exposed to unhealthy working conditions. The Auditor General (GoU, 2016a) further states that although the country's economy has registered a number of achievements, various aspects of occupational safety and health have not been adequately addressed. Management of occupational safety and health issues at workplaces continue to be left unattended by different sectors of government and the private sector. Uganda does not have a national safety and health policy and few occupational safety and health regulations in place (GoU, 2004). In terms of occupational safety and health compliance in Uganda the situation is demanding according to the report (Table 2.1).

Table 2. 1. Level of compliance with occupational safety and health requirements in sampled formal entities in Uganda

OSH Requirement	Compliant	Non-compliant	% Non-compliant
Written Workplace OSH policy	10	40	80%
OSH officers to manage OSH activities	12	38	76%
Clear fire exits	9	41	82%
Fire alarms in place	14	36	72%
Fire drills conducted for staff	8	42	84%
Possession of First Aid Box /facility	10	40	80%
Training of First Aiders / clinic	8	42	84%
Standard content list for First Aid Box	05	45	90%
Expired / serviced fire extinguishers	44	06	12%
No fire extinguishers	35	15	30%

Source: Auditor General's Report, 2016

From the Auditor General's report (Table 2.1) above where 50 entities were sampled, it is clear and evident that occupational safety and health implementation in Uganda is in a sorry state with only 20% compliance and non-compliance with 80% by the Regulatory Agency concerned. This is attributed to the inadequate staffing, inadequate awareness and sensitisation, limited logistics, absence of national occupational safety and health policy and lack of Occupational Safety and Health Laboratory to analyse exposure measurements and test personal protective equipment. (GoU, 2016a).

Many states have not ratified key conventions and do not have occupational safety and health policies in place. Uganda relies on the unratified Occupational Safety and Health Conventions No. 155 (11981), Recommendation No. 164 (1981) and Promotional Framework for Occupational Health Convention No.187 and its accompanying Recommendation No. 197 (2006) to implement occupational safety and health in the country. According to ILO, one of the many factors behind workplace accidents is that labour inspection systems in developing countries arises from not fully equipped manpower and who are not allowed to perform their tasks objectively and independently (McGarity and Sharpiro, 1996).

2.7 Factors affecting occupational safety and health knowledge, attitudes and practices

Training of workers on occupational safety and health as well as workers' rights within the workplace has been an important part of improving working conditions. Workers prior to commencement of new assignments should receive adequate training and information enabling them to understand the hazards of work and to protect their health from ambient factors that may arise (Gebremedhin *et al*., 2016). According to WHO (1998), the training must cover knowledge of the materials, equipment and tools, known hazards of operation and how to control them, potential risks to health, hygiene requirements, wearing and use of PPE, appropriate extremes, incidents and accidents. A study in Addis Ababa on solid waste collection (Bogale, 2012), revealed that only 20.8% of the solid waste collectors had training before they embarked on their job and 57.3% had an on job training after engagement on the job.

2.7.1 Cost of occupational safety and health measures

According to Ogunrinola, Fadayomi, Amoo and Sodipe (2012), investing in the safety and health of workers minimises internal production costs as the provision of safety gadgets and decent work environment involves costs that must be paid by the firm with expectations of receiving benefits of such investments in form of higher productivity. The equilibrium level of safety is the point where the rising marginal cost of job safety intersects the downward sloping marginal benefits from job safety (McConnell, Brue and Macpherson, 2010). However, evidence in most countries has shown that the level of safety attained is affected by the low level of investment in safe working environment by private firms and hence has motivated the public to intervene to reverse the trend.

2.7.2 Poverty

Poverty, a condition commonly associated with lack of resources and opportunities, a sense of hopelessness and insecurity that leads to social exclusion and linked to increased health risks generally. Age and age groups are considered social determinants of occupational safety and health due to the various social and economic conditions that may place people at higher risk of injury. Numerous studies in the United States revealed that children and adults to lower social economic status are linked to increased risk of death or disability from injuries (Raphael, 2010).

According to WHO (2006), work, the nature of employment and environment in which work occurs are determinants of health. Occupational safety and health can also be influenced by inequitable global, national and local level arrangements with negative physical, psychological, economic, political, religious and cultural factors that put people into harm (Social determinants). Social determinants of health are conditions which people are borne, live, work and age in. These are shaped by the distribution of money, power and resources globally, nationally and locally influenced by policy choices. How societies arrange themselves affects who gets poor or rich, sick or injured, receives treatment or who is healthy or sick (WHO, 2014).

‘‘*The poor health of the poor, the social gradient in health within countries, and the marked inequalities between countries are caused by the unequal distribution of power, income, goods and services, globally and nationally, the consequent unfairness in the immediate visible circumstances of people's lives- their access to health care, schools and education, homes, communities, towns or cities and their chances of leading a flourishing life. This unequal distributions of health damaging experiences is not in any sense a natural phenomenon but the result of a toxic combination of poor social policies and programmes, unfair economic arrangements and bad politics. Together, the structural determinants and conditions of health and are responsible for some major inequalities between and within countries'' (Marmot and Goldblatt, 2016).*

Atlantic Collaborative for Injury Prevention (ACIP) Report (Raphael, 2010), states that social determinants of health are linked to injury through a variety of pathways including risk and hazards in a community and home environments, stress caused by poverty and social exclusion, work pressure, access to safety services, equipment and education. The connection

between socio-economic status and occupational safety and health is mediated by conditions in workplaces such as housing, education and neighborhoods. The Atlantic Collaborative for Injury Prevention Report (Raphael, 2010), further stresses that social determinants of health include; income and income distribution; education – higher levels of education and literacy result into better health; unemployment and job security- lack of employment or insecure employment is not only a source of stress but often results into material and social deprivation.

2.7.3 Availability of Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) or clothing designed to protect the person's body against risks at workplace. It is the last resort line of protection to workers in the workplace. Employers are legally obliged to provide PPE at no cost, provide training, monitoring and supervision to reduce on the injuries at workplaces (ILO Convention 187; Health and Safety at Work Act (HESAWA, 1970); Uganda Occupational Safety and Health (OSHA, 2006); Kenya Occupational Safety and Health Act (OSHA, 2007). Training of staff on the proper use of PPE is key in providing knowledge to use the PPE and can be reinforced by supervision and monitoring at the workplace. This enhances the occupational safety and health practices over the long time leading to a positive occupational safety and health culture.

2.7.4 Size and place of work

According to Alli (2009), small workplaces have a worse record than large ones. In small enterprises the rate of fatal and serious injuries is twice that in large ones. The place of work of different occupational groups is a determinant for access to better safety and health, for reasons relating to both work hazards and the regulation. A study in Durban, South Africa (Lund *et al.,* 2016), revealed that informal workers in places like city streets, road sides, private homes and waste dumps are excluded from the formal occupational safety and health protection.

2.7.5 Government policy and legislation

ILO (2006), requires each ratifying member country to formulate, implement and periodically review a coherent national policy, take necessary measures to maintain an adequate system of inspections and make sure that different regulations especially those related to workplace safety are complied with. According to Alli (2009), appropriate

legislation and regulations together with adequate means of enforcement are essential for the protection of workers' safety and health. They form a basis for efforts to improve working conditions and working environment. Labour legislation lays down minimum standards which are compulsory and applicable to everyone. According to Ndegwa *et al.* (2014), occupational safety and health, dramatically developed a lot of interest in Kenya following the enactment of the Occupational Safety and Health Act (OSHA, 2007) which came into force in October 2007. This saw many workplaces operating without individual / institutional capacity for safety and health management to develop the requisite mechanisms in order to improve the safety of working environment and escape liabilities. Occupational safety and health legislation sets out specific standards and policies regarding practices in workplaces and determines the extent of the punishment to be meted out against offenders. The authors conclude that government laws and regulations have a strong influence on the extent to which firms implement occupational safety and health programmes.

Occupational safety and health legislation places a duty of care on employers to achieve adequate occupational safety and health implementation through safe workplaces, safe systems of work and provision of personal protective equipment (Hughes *et al*., 2011). Under the ILO Convention No. 155 (ILO, 1981b) workers are supposed to take reasonably practicable measures to protect themselves and others at work from risks arising from their actions and omissions at their work, cooperate with the employer in achieving high standards of safety and health at work and under obligation to use the PPE. However, according to Ogunrinola *et al*. (2012), the situation in the informal sector is different. The enterprises that operate in this sector do so without binding regulations including those that operate officially with regulations that do not compel rendition of official returns on its operations or production processes and even most laws relating to occupational safety and health are rarely complied with in the sector.

2.7.6 Safety culture of the organization

Safety culture of an organization can be divided to include; work practices, work style, operator training and industrial hygiene. Zohar (1980), while studying the effect of safety climate in industrial organizations identified eight principal components; perceived management attitudes on safety, effect of safe work practices on promotion, social status of individuals, status of occupational safety and health officer, status of safety committees, importance and effectiveness of safety training, risk at workplaces and enforcement versus

guidance. The author, further urges that safety climate appears to be directly related to the safety record of an organization. According to Coyle *et al.* (1995) modifying attitudes of both employers and employees towards occupational safety and health issues should improve the safety climate and safety record within the organization. Although modifying these components affect the implementation of control measures in formal establishments, they may not be applicable in the informal sector.

2.7.7 Literacy levels

Extreme neglect of illiteracy results into illiterate and poorly educated manual workers, including female workers. People with high education attainment are more likely to understand harmful exposures and likely to avoid them (Siziya, Rudatsikira, Mweemba, Rachiotis, Mugala, Bowa and Muula, 2013). In a Nigerian study conducted among welders (Sabitu Iliyasu and Dauda, 2009), found 20% of those who had no formal education were aware of occupational hazards and safety measures compared to 78% among those who had primary education and 85% who had secondary education. Those with higher educational attainment may also be employed in more skilled but less hazardous jobs. Highly educated people are more likely to be in managerial, supervisory, clerical and administrative work than in manual or factory work.

In Thailand, Kongtip *et al.* (2015) found out that informal workers have less formal education than the formal ones. Majority (64%) had only primary education, 28.7% had secondary education and only 7.1% had technical training or University degree. The related health impacts of illiterate workers are less awareness and comprehension of health hazards in working conditions that lead to injuries and occupational diseases as a result of poor apprehension of control measures. Employers are obliged to provide training and awareness to staff in form of induction and on job training as well as refresher training to help reduce the injuries and accidents in the workplace. According to a report by ACIP (Raphael, 2010), studies have demonstrated that education levels affect one's risk of serious injury, both fatal and non- fatal. The rate of serious non-fatal injury is higher for individuals of lower education levels, although less serious injury is not so clearly correlated with education. International studies indicate that uneducated men are more likely to experience fatal automobiles crashes than more highly educated men (Woolf *et al*., 2007).

2.7.8 Education, training and awareness

Education and training provide individuals with the basic theoretical and practical knowledge required to carry out their trade or occupation successfully and to fit into the working environment. It is one of the most important tasks to be carried out by employers. Workers need to know how to do their jobs, but also how to protect their lives and those of their co-workers while working (Alli, 2009). The training of workers on occupational safety and health issues as well as their rights within the workplace has been an important part of improving working conditions. Workers prior to commencement of new assignments should receive adequate training and information to enable them understand the hazards of work to protect their health (Gebremedhin, Debere, Kumi, Tirfe and Mondo, 2016). The training must cover knowledge of materials, equipment and tools, known hazards in the operations and how to control hazards; hygiene requirement, wearing and use of personal protective equipment, appropriate extremes; incidents and accidents (WHO, 1998). Alli (2009), further notes that because of the importance of occupational safety and health, measures should be taken to include these subjects in education and training at all levels in all trades and professions including higher technical, medical and professional education. However, there are few subjects on occupational safety and health in the curricula of most educational, technical and higher institutions of learning. This was confirmed by the National Safety and Health Profile 2014 (GoU, 2004) which clearly states that Uganda does not have any occupational safety and health training intuition.

2.7.9 Management practices

The protection of workers from occupational accidents and diseases is primarily a management responsibility, on par with other management tasks such as setting production targets, ensuring the quality of products or providing customer services (Alli, 2009). Alli further states that if management demonstrates in words and actions, through policies, procedures and financial incentives, that it is committed to workers' safety and health, then supervisors and workers will respond by ensuring that work is performed safely throughout the enterprise. Total commitment on the part of management to making safety and health a priority is essential to successful occupational safety and health program (Alli, 2009). However, the situation is different in small enterprise where policies and procedures are non-existent and no regulation is done by government. The Plan - Do - Check and Act (PDCA) approach to effective management of occupational safety and health at workplaces

emphasizes the cyclic steps of execution (Hughes *et al*., 2011) while the application of WHO Continual Improvement Process in large and small enterprises is hinged on management at the workplace (WHO, 2010).

2.7.10 Type of employment

Workers in the informal economy are more likely than formal workers to be exposed to poor working environment, low safety and health standards and environmental hazards hence suffer poor health and injury as a result. Most informal workers have little or no knowledge of the risks they face and how to avoid them. The very nature of the informal economy makes it almost impossible for governments to collect vital statistics to take appropriate remedial action, and since much of the informal work takes place in homes, therefore, occupational safety and health inspectors cannot investigate the working conditions and give advice to those who need it (Alli, 2009).

According to Keitany (2014), people working in the *Jua-kali* engage in a range of activities and involve workers of different skills including but not limited to motor technicians, carpenters, wood and stone crafters, artisans, vendors and street hawkers, shoe makers and cobblers. It also involves those in agriculture, tailoring, hair cutting, textile trading, grocery and food shops, electrical work, metal work and masonry among others. Majority of those working in the sector are exposed to a range of hazards and lack protection. The author further states that they encounter difficulties raising capital, accessing healthcare and have increased susceptibility to poor health owing to exposure in the workplace as well as due to inadequacy of shelter from extremes of weather, lack of safe drinking water, drainage and sanitary facilities.

2.7.11 Age group

According to Atlantic Collaborative Injury Prevention (ACIP) (Raphael, 2010), much research has been conducted on the high rates of adolescents, and practitioners struggle to understand how to effectively prevent injuries in this age group. In the case of adolescents, social and economic determinants interact with a biological propensity for higher risk taking behaviours. So while risk taking has benefits and is part of the adolescent development, inappropriate or excessive risk taking brings with it increased risk of harm. Although not applicable to all adolescents, evidence has shown that pubertal neurological changes that impact risk perception, reward seeking and social image can increase risk to injury and

endanger occupational safety and health. In Ethiopia, a study by Zewdie *et al*. (2011), revealed that, working at young age increases risk of sustaining more occupational injury among factory workers compared with older workers. The authors attributed this to the inaccessibility of occupational safety and health information, training, lack of experience and low level of knowledge and skills among young workers.

2.7.12 Gender

Gender- differences in how individuals are socialised and treated based on gender can lead to health disparities like wage gaps and sexual harassment. Gender determines access to health work in many ways that sometimes differ from or modify the influences of other social identities (Burgard and Lin, 2013). The socio-economic, racial, immigrant and other identities bring different socialisation of men and women and traditional division of labour around paid market and unpaid housework (Dinatale and Bovaas, 2002). Furthermore, women are also differentially sorted into jobs within the occupation structure leading to differential exposures at work and varying total hazard exposure (Wooten, 1997). On the other hand women are disadvantaged at work in many ways than men, occupying fewer highest level positions in organizations and the occupation structure (Jacobs and Gersom, 2005). Women are also less likely to hold many of the physically dangerous jobs and spent less total time at work. This may be an advantage to women (Leeth and Russer, 2000). According to Zewdie *et al.* (2011) male workers were found to be 2.5 times more likely to report occupational injuries than female workers. This is due to the willingness of male workers to engage towards risk taking behaviour than female workers. Men experience work accidents more frequently than women and their injuries are even more severe (Ercan and Kiziltan, 2014).

2.8. Occupational safety and health management at workplaces

The objective of OSH management is to ensure that workplaces are safe to operate in, operations do not impact negatively on the health of workers and safety awareness amongst personnel is increased. Consequently, OSH initiatives lead to preservation of health in the workplace (Seoke, 2013). The author further states that a health workplace is an important preliquisite for economic growth and global competitiveness of the country. Workplace health promotion should be a continuous process, lived by every worker and employer and should be continuously improved. According to Seoke (2013), all levels of government both

central and local, non-governmental agencies and the community play integral part in the sufficient delivery of workplace safety and health promotion.

According to Goetsch (2011), the fundamentals of hazard prevention and deterrence include; elimination of the source of the hazard, substitution of less hazardous substances, reduction of the hazard at source, removal of the employee from the hazard, isolation of the hazard, dilution of the hazard, application of management practices, (administrative controls), use of PPE, training and practice of good housekeeping. Some of these strategies can actually reduce the hazards in the informal sector. The applicable and cost effective ones could be the use of PPE, administrative controls or management practices, good housekeeping and training of employees. Goetsch (2011) further concludes that one of the best ways to promote safety is to design it into the tools, machines and technologies with which people interact with in the workplace. Safety analysis can also be effective by eliminating hazards before they cause accidents or illness. The author, however observes that even the best design/ analysis cannot completely eliminate accidents, for this reason it is important to have accident prevention procedures and make sure that employees comply.

Promoting safety begins with having a published company safety policy. The policy should make it clear that safe work practices are expected of all employees at all times. It serves as a foundation on which other promotional efforts are hinged. One of the keys to successfully promote safety at work is to involve the employees. They usually know better than anyone else where the hazards exist in addition, they are the ones who must follow safety rules. Safety training is one of the best ways to promote safety in the workplace. Initial safety training should be part of the orientation process for new employees, subsequent safety training should be aimed at developing new, specific in-depth knowledge and at reviewing or updating existing knowledge. Another way to promote safety at workplaces is through the use of safety committees. These provide a formal structure through which employees and management can channel concerns and suggestions about safety and health issues. Uganda's Occupational Safety and Health Act (OSHA, 2006), requires firms with five and above employees in a workplace to set up safety committees and only requires a safety policy when the firm or company has a staff of ab more than 20 workers, yet most of the enterprises in the informal sector have less than five at the workplace.

According to Makin *et al*. (2010), there are three main approaches that have emerged to manage hazards at workplaces and these include; safe person, safe place and safe systems. Safe person strategies involve techniques that focus on equipping the person with knowledge and skills to avoid creating dangerous scenarios in the first instance or with the ability to deal with unsafe situations should they arise; communicating awareness of situations that have the potential to cause harm or with the recovery of the person after an illness or injury experience whether it being physical or psychological. Due to the complexity of issues associated with the human factor, a wide range of treatment options can be listed like; pre-employment screening, training needs analysis for competency awareness and refresher training, continuing education, networking, awareness of fatigue, employee assistance programs, health promotion and vaccination, use of personal protective equipment, application of behavioural based safety.

Safe place strategies are underpinned by risk assessment process and the application of the hierarchy of controls up to the point of where alterations are made to the existing physical environment. They include arrangements for abnormal emergency situations, monitoring and supervision. Safety system strategies refer to situations of leadership and direction in putting up safety systems in place and may include setting OSH policy, safe procurement criteria, incident investigation as well as having preventive and reactive mechanisms in place (McSween, 1995). Safety system strategies may require regular feedback and open commination (Makin *et al*., 2010). Setting work place policies and carrying out incident investigations as well as feedbacks and open communication may not be feasible in the informal sector.

The Promotional Framework for Occupational Safety and Health Convention, 2006 (No, 187) and it is accompanying Recommendation (No.197) integrate two fundamental principle pillars of the ILO strategy to improve safety and health in the world of work; namely the building and maintenance of a national preventative safety and health culture, and the application of a systems approach in the management of OSH at both national and enterprise levels. The objective is to promote continuous improvement of OSH to prevent injuries, diseases and death. The convention provides for the development, establishment and implementation of a number of tools for sound management of occupational safety and health, in consultation with the most representative organizations of employers and employees as well as other stakeholders in occupational safety and health. These tools

include; a national occupational safety and health policy as defined by the Occupational Safety and Health Convention (No. 155), 1981, the national occupational safety and health system and the national occupational safety and health programme based on the elaborate and periodic updating of a national occupational safety and health profile.

The promotion of occupational safety and health, as part of the overall improvement in working conditions, represent an important strategy not only to ensure the wellbeing of workers but also to contribute positively to productivity. Health workers are more likely to be better motivated, enjoy greater job satisfaction and contribute to better quality of products and services thereby enhancing the overall quality of life of individuals and society. The health, safety and well-being of people are thus prerequisites for improvements in quality and production and are utmost importance for equitable and sustainable development (Alli, 2009).

According to Alli (2009), a country needs to develop a national occupational safety and health policy. Such a policy should aim at promoting and advancing at all levels the rights of workers to a safe and healthy environment; assessing and combating at source occupational risks and hazards and developing a national preventative safety and health culture. This can be followed by a national occupational safety and health system which comprises of all the infrastructure, mechanisms and specialised human resources required to translate the principles and goals defined in the national occupational safety and health policy. Lastly, the country should develop and implement a national occupational safety and health program. The national occupational safety and health programme is the strategic programme with predetermined time frame, which focuses on specific national priorities for occupational safety and health, identified through the analysis of the National Occupational Safety and Health System and up to date national profile. The aim of this programme is to promote, develop and maintain a preventative occupational safety and health culture and bring about continuous improvements to the weak or ineffective elements of national occupational safety and health system.

At enterprise level, good occupational safety and health management involves industrial hygiene, application of ergonomics, safe systems of work, risk assessment, engineering and administrative controls among others supported by an Occupational Safety and Health Management System (OSHMS) (Alli, 2009). Typically, an OSHMS should contain the following elements: - the occupational safety and health policy; necessary conditions for

executing organizational roles i.e. establishment of responsibility, competence and training, monitoring and supervision, documentation and information, communication and information; risk assessment, planning and implementation of occupational safety and health activities, performance and action for improvement. Reporting, recording, notification and investigation of work related injuries, diseases, ill health and incidents for reactive monitoring should be undertaken, purposely to provide information about occupational accidents and diseases at enterprise and national levels; identification of major safety and health problems arising from workplace activities; defining priorities for action and developing effective methods of dealing with occupational accidents and diseases, as well as monitoring the effectiveness of measures taken to secure satisfactory levels of safety and health (ILO, 2006; Hughes *et al*., 2011; ILO, 2013). However, the people factor or social determinants were not put into play for successful occupational safety and health management.

The US Occupational Safety and Health Administration (US OSHA, 1970) requires that employers protect their workplace hazards depending on the dangers of workplace settings. It recommends the use of manufacturing or work practice control to handle or reduce hazards to the maximum level possible. Personal Protective Equipment (PPE) is usually required to be worn to minimize exposure to a variety of hazards (Amir *et al*., 2017). Although this can be feasible enforced in formal enterprises, it is a myth in the informal sector in developing countries.

The positive impact of introducing an occupational safety and health management system at enterprise level, both on the reduction of hazards and risks and on productivity is now recognised internationally by governments, employers and workers. The mutual benefits that accrue from the introduction of such systems should not be ignored if progress on improving safety and health and productivity are to be achieved. Puplampu (2012), states that despite attempts by states and industry to protect employees' occupational safety and health, there is still little attention to occupational safety and health issues in the developing countries.

The preventive integration of safety and health principles into workplace organisation is a fundamental pre-requisite for reduction of injuries and diseases. The essential pillars of an effective strategy on occupational safety and health include building and maintaining a

preventative safety and health culture, where the principle of prevention is accorded priority; introduction of a systems approach to safety and health management; ensuring that the right to safe and health working environment is respected at all levels; and ensuring active participation by management and staff in securing a safe and health working environment (GoU, 2008).

During the 1970 and 1980s, serious industrial accidents occurred including the 1974 Flixborough accident, 1976 Seveso incident and 1987 Piper Alpha disaster (Hughes *et al.* 2011). Investigations into the above incidents highlighted deficiencies in the previous prescriptive approaches in the management and regulation of occupational safety and health and identified the need to develop approaches which systematically addressed both education and engineering responses. This led to the "Management Systems Approach." The introduction of the management systems approach provided a framework and structure for the development, implementation and review of the plans and processes necessary to manage occupational safety and health in the workplace.

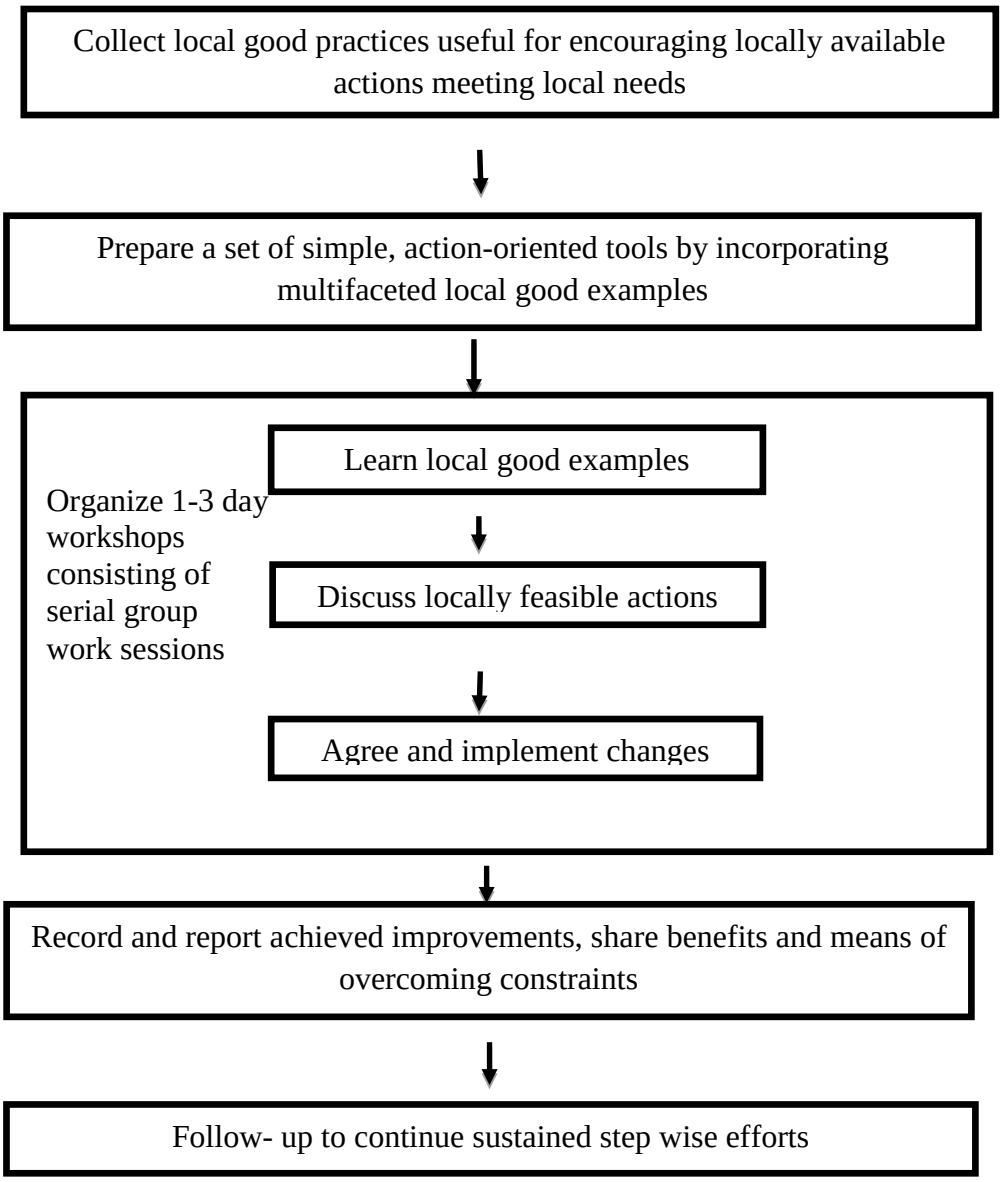
Great emphasis was placed on the duty of care, risk management and workforce representation. The primary responsibility of safe workplace remains with the employer. This became a game changer and gave rise to the "Plan - Do- Check- Act (PDCA) approach". The PDCA approach at disposal is now key in the successful safety and health management at workplaces (Hughes *et al.*, 2011). The ILO System (2001), hinges on the same key elements which include; policy, organising, planning and implementation, evaluation, auditing, action for improvement and continuous improvement to achieve adequate levels of safety and health at workplaces. However, many organizations have gone ahead to combine topical standards of quality, environment and occupational safety and health into a single standard 'the Integrated Management System' as there are a large number of common elements. However, these approaches only designed for legal (formal) organisations.

The latest approach to occupational safety and health management is the integrated approaches. According to Cooklin, Joss, Hussier and Oldenburg (2015), integrated approaches combine occupational safety, health and injury prevention with health promotion to protect and promote workers' health, safety and wellbeing. Hymel, Loeppke and Basse (2011), define integrated approaches as "the strategic and systematic integration of distinct environmental, safety and health policies and programs into a continuum of activities that

enhance the overall health, safety and wellbeing of the workforce, prevents work related injuries and illnesses." Integrated approaches incorporate health promotion, organizational development, psychosocial and physical environments to achieve adequate levels of occupational safety and health at workplaces. However, despite the empirical evidence about the efficacy of the integrated approaches to workers' health, safety and wellbeing, the application is still sparse and has not been applied at workplaces. Hymel *et al*. (2011), notes that research about the occupational safety outcomes in integrated approaches is still scanty.

2.8.1 Participatory action-oriented approaches to small enterprises and the informal sector

According to Kogi (2012), small enterprises and the informal sector can use the 'Participatory Improvement Program', where they utilize in a flexible manner local practices and low cost improvements. The combined use of illustrated good examples and low cost action checklists have proven effective. The participatory improvement program makes use of the positive features of small workplaces (Figure 2.1). This is done particularly by presenting good practices to local key persons by informal action-oriented approaches and encouraging people to apply available technical solutions in a flexible manner. A network of these positive experiences is essential especially through the apex and group businesses.



Source: Kogi, (2012)

Figure 2. 1: Kogi's model for participatory steps commonly taken for emphasizing locally feasible stepwise progress in small enterprises

In Dar es Salaam, Tanzania, the ILO Interdepartmental Project on the Urban Informal Sector, an integrated approach to productivity, employment creation, health promotion and social protection for the informal sector was tested. The model was based on the local capacity of the informal sector operators to undertake low cost improvements at the micro enterprise level, prevent injuries and diseases, enhance access to healthcare through the introduction of a self-sustainable health insurance scheme and referral system for the

extension of occupational health services using the existing public health structures under a community health approach. It involved raising awareness on occupational safety and health hazards in the micro enterprises of a number of selected clusters in the informal sector and the provision of occupational health and preventive services with in the Primary Health Care (PHC) structure. Training component involved participatory training modules to show the link between productivity and promotion of working conditions. It focused on physical, chemical and bio-hazards in the working environment. Low cost corrective measures were introduced (Rongo, Barten, Msamunga, Helderik and Dolmans, 2004).

Participatory training programs like Work Improvement in Small and Medium Enterprises (WISE) and Work Improvements in Neighbourhood Development (WIND) are increasingly being applied in Asia for supporting grassroots initiatives in the informal economy workplaces to improve safety, health and working conditions. These are low cost, locally available materials particularly in improved working stations, machine guards, safe handling of hazardous substances, they apply illustrated checklists and extensive use of photographs in identifying low cost solutions. They are assisted by government trainers who disseminate local good practices in occupational safety and health, train informal economy workers and network them for sustainable improvement actions. This can be achieved in a six step approach for promoting participatory occupational safety and health training in the informal economy workplaces;

Step 1 – Identifying low cost partners
Step II– Collecting local good examples
Step III- Organising pilot training
Step IV- Training local trainers
Step V – Training by local trainers
Step VI – Sustaining networks through follow up actions

These six steps can be ably applied in small enterprises and the informal sector to improve occupational safety and health situation (Kogi, 2012).

2.9 Compliance levels of occupational safety and health measures at workplaces

Compliance of safety and health measures is affected by the barriers to good standards of occupational safety and health which include complexity- a situation where employees usually become unhappy with the amount of information available on safety and health. This

may not be tailored to them including the red tape procedures to perform simple jobs. Regulation requirements can become overwhelmingly difficult to understand and poorly communicated. Competing demands to meet production targets or keep within the budgets may compromise safety and health of workers while behavioural issues particularly changing workers' attitudes and behaviour to work safely is one of the biggest challenges in the safety and health at work. Therefore, to achieve high levels of safety and health requires a safety and health culture and enforcement. These can be through proper and competence recruitment, training, supervision, monitoring and evaluation of workers supplemented by a system of accountability and enforcement where institutional failures at the workplaces are addressed (Hughes *et al*., 2011). Further, the authors acknowledge that changing behaviour issues, workers' attitudes and behaviours to work safely is one of the most challenging tasks in safety and health. They however don not suggest how this could be done. The informal sector attitudes are very poor due to lack of training and regulation.

2.10 Theoretical framework

The study is hinged on two theories; Heinrich's Domino Model of Accident Causation Theory and the Theory of Work adjustments. Heinrich Domino's theory states that accidents result from a chain of sequential events, metaphorically like a line of dominoes falling over. When one domino falls, it triggers the next one, and the next, but removing key factors like unsafe act and unsafe condition, prevents the start of the chain reaction (Heinrich, 1980). Heinrich (1980), further states that all accidents directly relate to unsafe acts and unsafe conditions which were summarised as the 'social environment and ancestry'. The study explains that undesirable personality traits, such as stubbornness, greed, recklessness can be passed on through inheritance or develop from the persons' social environment and that inborn character flaws, such as bad temper, inconsiderateness, ignorance and recklessness can contribute to accident causation. Heinrich defined four reasons why people commit unsafe acts, these are; improper attitude, knowledge or skill and physical unsuitability (social factors) and mechanical or physical environment (workplace factors). For example, a worker who commits an unsafe act may do so because of lack of conviction that appropriate preventive measures are necessary and lack of adequate supervision. The remedy for non-compliance therefore was strict supervision, remedial training and discipline.

Flynn, Eggerth and Jacobson (2015), using the Theory of Work Adjustments in understanding and analysing the perceived work adjustments strategies over work

environments, summarises social determinants into 3Ds (demeaning, dirty and dangerous). His study placed work adjustments strategies into four cognitive behavioural themes; killing yourself to make a living, the jobless fear, the economic vulnerability and limited access to resources. Killing yourself to make a living is a situation where workers feel significant pressure to find a job in order to survive and contribute to economic wellbeing of their families. The elusiveness of the first job combined with pressure to start earning money can influence the workers experience from the beginning. The jobless fear involves the fear of losing a job, deportation or detention for the case of illegal workers / migrants, impact on the workers behaviour in a way that makes them daring to accept all jobs including the unsafe ones. Economic vulnerability or poverty can make people desperate to accept any job regardless of the hazards and health risks for survival. Lack of education, skills and experience make workers not to understand the potential hazards inherent in the work environment while limited access to institutional resources like training, awareness, labour inspection, social protection, occupational safety information, services and legal advice affect workers' safety and health. Age or age-group is one of the most important factors in workplace injury. Young workers (Adolescents) are fast and would like to impress others, due to peer pressure and may have higher incident rates than adults (Flynn *et al*., 1993).

2.11 Research gaps

ILO (2013), estimates that fatal diseases account for 85% of all work related fatalities but only half of the countries provide official statistics for occupational diseases. It further states that underreporting, public ignorance, lack of treatment and compensation, low resources for occupational safety and health improvement and data collection are the main gaps. However, most of the literature has not addressed the reasons why there are such high numbers of accidents and fatal injuries in workplaces and the informal sector in particular.

Due to the limitations of national data collection systems in many countries, there are no consistent figures on work related injuries and diseases, and although occupational safety and health research attempts were made, little attention has been given to Small and Medium Enterprises and the informal sector (Puplampu, 2012). National Occupational Safety and Health Profile for Uganda 2004 (GoU, 2004), states that the risks and hazards to which Ugandans are exposed to in Uganda are not adequately documented and contents that in terms of statistics, there is very little collected. To date, 14 years since the last published national profile in 2014, no other National Safety and Health Profile has been produced.

Although studies have been done in health units and vocational training institutions on types of hazards, no known documentation is available on the informal sector in Uganda.

According to Karimlou *et al.* (2015), work-related accidents are a result of multiple factors including individual behaviour, environmental factors and workplace conditions. However, these multiple factors have not been investigated on the individual behaviour, environmental factors and workplace conditions. This suggests that safety practice does not depend on knowledge and attitude but is positively associated with being informed about safety precautions and being supplied with safety gear coupled with adequate and proper supervision (Bradshaw *et al.,* 2001). Studies in the informal sector on knowledge attitudes and practices have not been documented in the country's informal sector to compare the circumstances.

According to Alfers (2009), despite the abundance of health and safety risks in large and growing informal economy as well as institutional mismatch, little attention has been paid to the subject of occupational health and safety in literature on risk and social protection.

2.12 Conceptual framework

Occupational safety and health implementation at workplaces depend on many variables (Figure 2.2). These independent variables include; workplace hazards, legal frameworks e.g. laws, regulations, policies and enforcement; employer's safety and health administrative measures e.g. Provision of PPE, training, and supervision; knowledge attitudes and practices of workers and compliance of occupational safety and health practices. These variables can be influenced by social factors at work that include; age, gender, education, employment; experience, income status and poverty, government regulation /enforcement and social partners to achieve adequate levels of occupational safety and health implementation in an organisation.

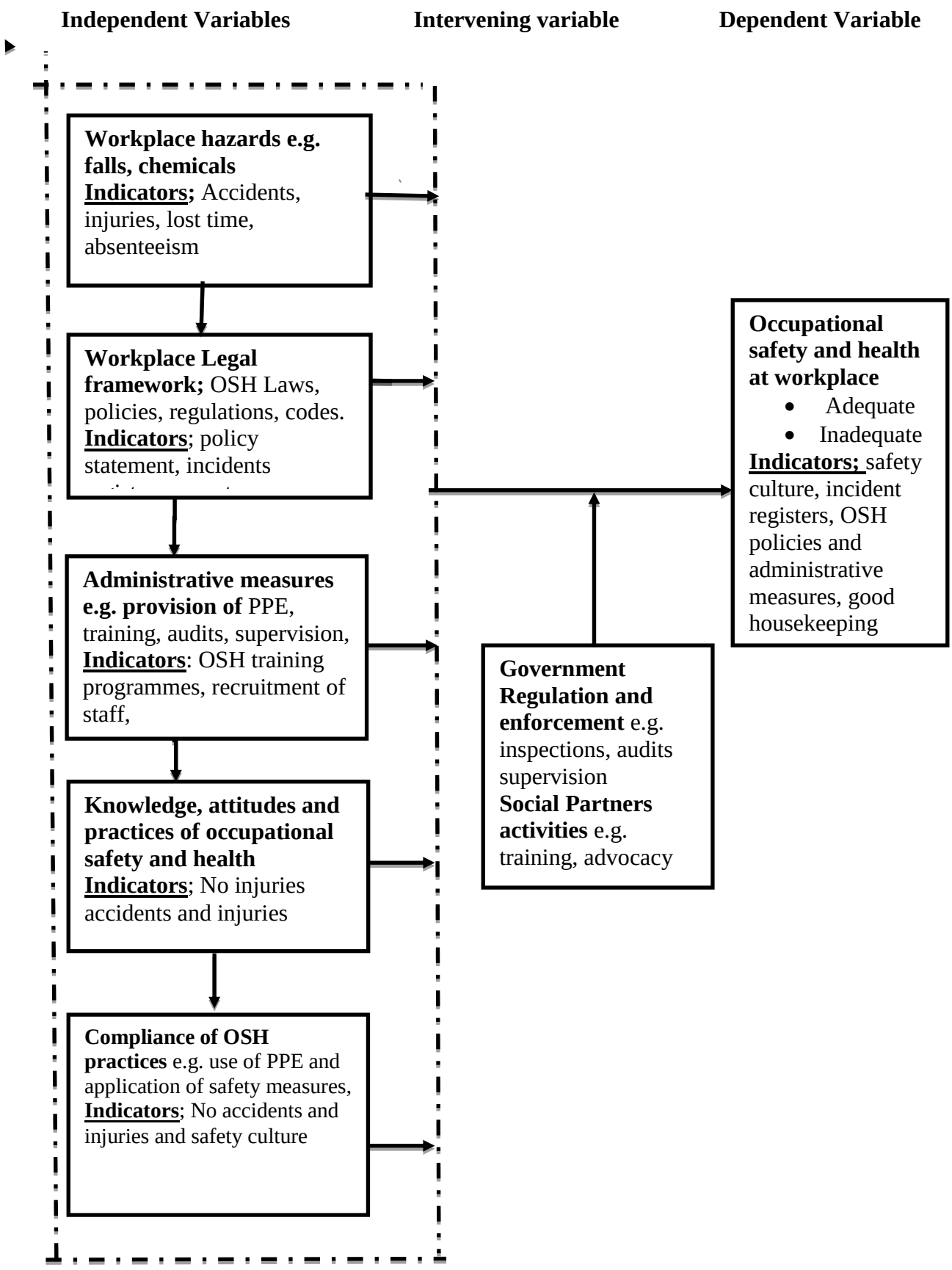


Figure 2. 2: Conceptual framework for OSH implementation at workplaces

CHAPTER THREE
METHODOLOGY

3.1 Description of the study area

3.1.1 Location of the study area

Kampala City also referred to as 'Kampala Capital City Authority' (KCCA) lies on Latitudes 00º 18' 49" North of the Equator and Longitudes 32º 34' 52" East of Greenwich. It is bordered by Wakiso district on the South, West and North, Kira Municipal Council on the East and Lake Victoria on the South. It is the commercial and administrative capital city of Uganda situated on the northern shores of Lake Victoria, approximately 45 Km north of the equator and found at a height of 1,222m above sea level. Administratively it is divided into 5 divisions (Municipalities) which include; Kampala Central, Nakawa, Kawempe, Rubaga and Makindye divisions, with a total land area of 169 Km^2 and 19 Km^2 of water (Figure 3.1).

3.1.2 Climate

Kampala City enjoys a humid tropical type of climate although strong elements of equatorial conditions are normally experienced due to it is altitude on the equator and the cooling breezes of mountains even though it is a little bit north of the equator. The average maximum day time temperature is 25^oC in January, dropping to around 24^oC in July. Kampala City receives an annual rainfall of between 1,750 – 2,000mm per year. There are two distinctive rainy seasons, March– May and September – November (KCC, 1997).

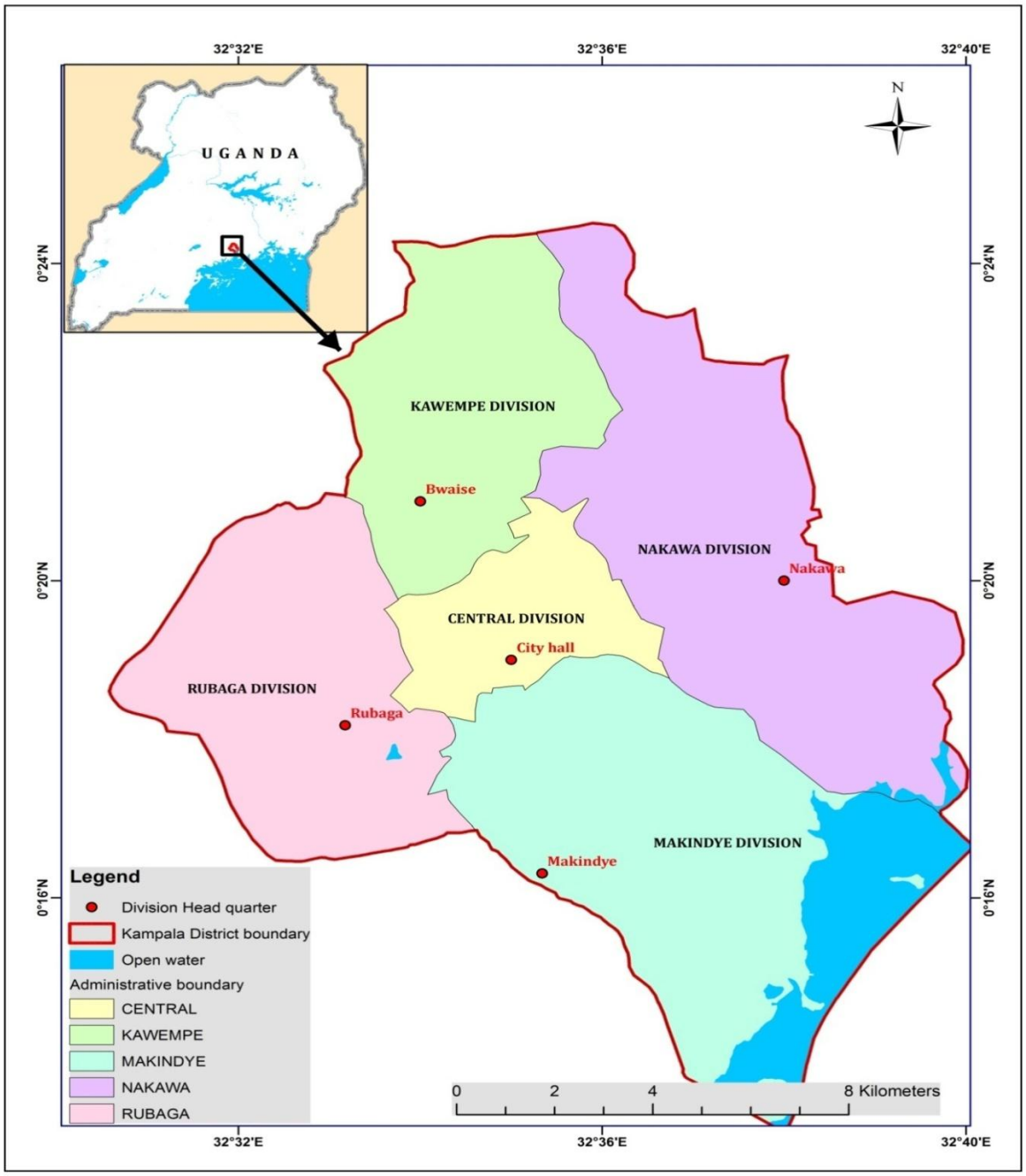


Figure 3. 1 Administrative Map of Kampala City, Uganda showing the study areas ***(Source: KCCA GIS Department, Uganda)***

3.1.3 Demographic and socio- economic characteristics

Kampala is the largest urban centre and only city in Uganda. It is the political seat, the country's economic hub accounting for 80% of the country's industrial and commercial activities. It generates about 65% of annual GDP. However, only 23% of Kampala City is

urban, 60% semi-urban and 17% rural (KCCA, 2016). According to Uganda Bureau of Statistics (UBOS. 2014), Kampala City has a population of 1,507,050 people, comprising of 724, 326 males and 782,754 females. It has a population density of 7,928 people per Km^2 and an average household size of 3.5 persons. About 4.5 million people work daily in the city at an annual demographic rate of 13.9% (KCCA, 2016). The city residents generally enjoy a very low standard of living, low quality of life, limited amenities and services. The working population is about 55.6% (65.2% female and 47.2% male). The main sources of livelihood for the city population are; employment (57.5%), trade (22.7%) and other sources which include fishing, subsistence and commercial farming (19.8 %). The major commercial activities in Kampala city include; buying and selling of goods and services, with major items of trade being agricultural products and inputs, auto parts, clothing, furniture, building materials and fabricated products (KCC, 1997).

Like any other developing country city, Kampala City has a very dynamic growing urban informal sector. UBOS (2014) estimates that Kampala City alone has 35% of the total number of business establishments (456,106). The average number of employees is 4-5 employees in more than 90% of the establishments employing about 1.1 million people. Seventy percent (70%) of the majority businesses have a total annual turnover of over 5 million Uganda Shillings. About 10% has annual turnover of more than 10 million, 53% with 10 million are in the trade sector and manufacturing with 11%. In terms of legal ownership, 94% of the businesses are sole proprietors of which 40% are owned by women. Manufacturing businesses in the city account for 32% and consists of two sub- sectors; the food and non-food manufacturing. The non-food manufacturing comprises of establishments which range from textiles and weaving apparel, leather and related products, saw milling, paper and printing, brick and concrete products, metal products, machinery and equipment repair, furniture and other manufacturing with total employment of 140,000 people, Kampala City is faced with urban challenges of high population due to liberal economy which has led to the emergence of the informal sector with high number of workers and their families. This has been the result of rural-urban migration and unemployment. Other challenges include high volumes of garbage at a rate of 1,500 tonnes per day with only 500 tonnes collected. The uncollected garbage pose health risks and safety hazards, poor sanitation and blocked drainage causing flooding. Most of the floods affect the informal sector who are located in marginal lands, road reserves and open areas.

3.2 Study design and setting

The study used a cross sectional survey design that involved both qualitative and quantitative data collection techniques. The cross sectional survey design was used because the study was done across the entire informal non-food manufacturing sector at the same time in Kampala Capital City Authority, Uganda. This was consistent with Jonathan (1997) who used the same cross sectional survey design to investigate cotton fabric dust exposure in garment factory in Lesotho while Nguyen Thi Hong Tu *et al.* (2003) used the same design on occupational health and safety conditions in small, medium sized and informal sector enterprises in Vietnam. Similarly, Gabe (2014) used the same design to investigate occupational health and safety in small scale clothing enterprises in Gaborone, Botswana.

3.3 Sampling

A total of 424 informal non-food manufacturing enterprises were sampled from the seven sub sectors that included; manufacture of textiles and clothing, furniture, bricks and concrete products, metal fabrication and welding products, repair of machinery and equipment, recycling of paper and paper products and other manufacturing like pottery and stone crashing.

Due to the heterogeneity of the informal sector, the study utilised a cluster sampling technique. Cluster sampling is a sampling method where the entire population is divided into groups or clusters and a random sample of these clusters is selected. It is used when 'natural' but relatively homogeneous groupings are evident in the statistical population. Cluster sampling is generally used when the researcher cannot get the complete list of the units of the population they wish to study but can get a complete list of groups or clusters of the population. The method is more practical and economical than simple random sampling (Singh and Masuku, 2014). The total number of informal enterprises in the seven subsectors was obtained through proportional sampling to size method. At firm level, the owner was automatically chosen for interview and where the enterprise has workers, one of the workers were considered for the study by simple random sampling. The informal enterprises were first stratified into divisions basing on the spread (Table 3.2).

3.4. Sample size determination

The assumption in studying a sample is that the characteristics of the sample will reflect the characteristics of the entire population in question, the researcher can be able to

draw conclusions that would be generalised and applicable to the population of interest (Mugenda and Mugenda, 2008). It would therefore be possible to obtain sufficiently accurate results by studying only part of the total population (Kothari, 2009).

The sample size of the study was determined using the following formula by Singh *et al*. (2014) to yield a representative sample for large populations

$$n = \frac{Z^2 pq}{e^2}$$

Where ***n*** is the sample size

$\boldsymbol{Z^2}$ is the abscissa of the normal curve that cuts off an area α at the tails (1- α equals the desired confidence level is 95% (1.96)

E is the desired level of precision (0.05)

P is the estimated portion of an attribute that is present in the population equal to 0.5 and q is 1- p

Therefore the sample size was n $= \frac{Z^2 pq}{e^2} = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$ = 385 enterprises

Sample size was 385 enterprises plus 10% non-response to give 424 enterprises.

Table 3. 1: Sample size determination

Informal subsector	**No. informal business**	**Sample size**
Manufacture of Textiles and Apparels	4,543	222
Recycling of paper and paper products	805	40
Manufacture of bricks, concrete products	129	06
Manufacture of metal products	1,288	64
Manufacture of furniture	1,446	70
Repair of equipment and machinery	126	08
Other manufacturing	315	15
Total	**8,652**	**424**

Source: Census of Business Establishments (UBOS, 2011**).**

3.5. Inclusion criteria

The study only targeted enterprises with less than 5 employees in the informal non-food manufacturing sector in Kampala City, registered or unregistered who had worked for more than 30 days in the informal non-food manufacturing sector and willing to participate and the willing enterprises that signed a consent form.

3.6 Exclusion criteria

The study excluded workplaces that were not involved in some sort of manufacturing of products from raw materials in the informal non-food manufacturing sector in Kampala City. People who were not employed in the sector like students, apprentices and those who had worked for less than 30 days and those who declined to participate.

3.7 Data sources

Relevant information for the study was obtained from both primary and secondary sources. The secondary data were obtained from relevant literature such as scholarly articles, Audit reports, OSH annual reports, National OSH profile, ILO OSH Conventions, Acts of Parliament and text books. The primary data were obtained through the field survey during which the informal non-food manufacturing sector employers, employees and key informants in the Ministry of Gender, Labour and Social Development, KCCA, NOTU and FUE were interviewed in Kampala City.

3.8 Data collection tools

3.8.1 Workplace Checklist

At the workplace, the researcher carried out a "walk through survey" using a workplace standardised assessment/ hazard identification ILO adapted checklist on guidelines for safety, health and working conditions inspection (Appendix III) to capture the workplace occupational hazards and their control measures. The checklist was used to get first-hand information about the types of enterprises, level of technology and types of occupational hazards inherent at the workplace as well as the control measures being applied. Also captured on the checklist was occupational safety and health legislation, PPE usage, safety of machinery, general workplace/ environmental conditions and work design. The use of a checklist prescribed in the ILO Work Improvement in Small Enterprises (WISE) method is a practical instrument for investigating and improving policy for workplace safety and health (Kogi, 2012). The checklist is ideal for rapid risk assessment when inspecting important areas

of a workplace for the purpose of determining planned improvements. The checklist was administered by the principal investigator.

3.8.2 Questionnaires

The questionnaire (Appendix I) was used to collect data on socio economic characteristics of the respondents which included; age, sex, marital status, educational level, work history, gender distribution of staff and work activities. Additionally, data was collected on the type of enterprise, type of technology and occupational safety and health practices, types of hazards experienced at workplace and control measures in place to manage hazards. Information on knowledge, attitudes and practices affecting occupational safety and health at work was solicited as well as laws, regulations and policies. The questionnaires were administered by two trained research assistants.

The aim of using questionnaires was to generate reliable and valid data from a population within a reasonable time period at a minimum cost. Questionnaires are often criticised for their failure to allow for interaction and capturing the views and experiences of the study interviewees (Gorard, 2006; Taylor *et al.* 2006). However, this challenge was overcome by using both open and closed ended which allowed interaction between the interviewees and the interviewer probing the issues at the workplace. Knowledge was assessed using 10 questions on a scale of 1-10 marks where the employees would answer correctly or incorrectly on the relevant precautionary measures. Good knowledge was assumed when the respondent gave 7 and above right answers, moderate knowledge was assumed when respondents gave between 4 and seven, while poor knowledge was assumed when the respondent gave less or equal to 4 answers right. More than 7 right answers meant adequate knowledge of occupational safety and health and ≤ 5 right answers had inadequate knowledge.

Attitudes were assessed using questions on the Likert scale rating of 1-5 (1= strongly disagree, 2= disagree, 3= no response 4= agree and 5=strongly agree). Each response was given 1 mark. Responses 1- 3 i.e. strongly disagree, disagree and no response were ranged as having poor attitude while responses 4-5 i.e. Agree and strongly agree were ranged as good attitude. The questionnaires also collected data on workplace laws, policies and social factors of occupational safety and health, approaches of management, challenges and suggestions in the informal sector.

3.8.3 Interview schedule

At regulatory level, 10 key informants were purposively selected due to their regulatory roles in occupational safety and health and interviewed using the interview schedule. These included; Assistant Commissioner for Occupational Health, Principal Occupational Safety and Health Inspector- Mechanical, Principal Occupational Safety and Health Officer in charge of Construction, Principal General Occupational Safety and Health Inspector, Senior Occupational Safety and Health Inspector, Occupational Safety and Health Focal Person for the Federation of Uganda Employers (FUE) and National Organization of Trade Unions (NOTU) Research and Policy Officer. Others included; Inspector of Drains KCCA and OSH Manager of KCCA. Using the interview schedule, data was solicited on policy mandates, workplace legal and policy gaps for OSH implementation in Uganda. The OSH Management System could not be accessed during the study since it was temporarily out of use. Data was collected from May to August 2018.

3.9 Data management

Field checking of questionnaires was done after the field interviews, errors were immediately verified and corrected daily. The quantitative data collected was entered into Statistical Package for the Social Sciences (SPSS) Version 20.0 software for analysis.

3.10 Reliability of the research tools

According to Polit and Hungler (2013), reliability is the degree of consistency with which an instrument measures the attributes it is designed to measure. Research tools were piloted with 20 questionnaires in similar workplaces in the informal sector in a different non sampled location in Mukono Municipal Council. The pilot data results were subjected to reliability tests (Chronbach's alpha and Kuder-Richardson (KR). Coefficients were used and both obtained statistical outcomes for internal consistency. According to Chronbach's alpha reliability, an alpha coefficient of 0.663 was obtained. This is in line with the Chronbach's coefficient of 0.6 and above (Odiya, 2009). Hence the tools were found to be reliable.

3.11 Validity of the research tools

The validity of the research instruments determine whether the research truly measures what is intended to measure. The study achieved both content and external validity. Bashir (2008) considers content validity as the extent to which an instrument represents the variables under study. The Content Validity Index (CVI) shows the degree to which each

item is rated as appropriate for measuring the attribute being measured. This was found by considering the number of items declared relevant items (RI) divided by the total number of presented items in the research tools (PI) i.e. (RI/ PI x100) was valid at 0.6. According to Odiya (2009), an instrument to be accepted as valid, should have the average index of 0.6 or above. The research instruments rated each objective in terms of the relevant items over the presented items multiplied by 100 to get the contingent validity index during the pilot. The results were 0.663 and therefore considered valid.

3.12. Ethical considerations

The ethical approval of the study protocol was done by the Makerere University School of Social Sciences, Research Ethics Committee (MAKSS-REC) and Uganda National Council for Science and Technology (UNCST). Permission was sought from the Ministry of Gender, Labour and Social Development and also from Kampala Capital City Authority. Participation of the study population was voluntary and each research participant signed a written informed consent form.

3.13 Data Analysis

Descriptive statistics were generated using Statistical Package for Social Sciences (SPSS) statistical software windows (2011) version 20.0 (Armonk, NY: IBM Corp) for the demographic variables. Data was summarised into descriptive statistics that included frequencies, percentages and reported in tables and graphical form. The independent variables were; workplace hazards, workplace legal framework, administrative measures, knowledge, attitudes, practices on occupational safety and health and compliance levels while the dependent variable was adequate or inadequate OSH at workplace influenced by the social environment and government regulation as intervening variables. Chi-square (χ^2) test was used to test the associations of social demographic variables considered significant at $p < 0.05$ at 95% of OSH practices, while multivariate logistical regression analysis was done to determine the factors affecting occupational safety and health practices in the informal non-food manufacturing sector.

3.13.1 Multivariate logistical regression analysis

A multivariate logistical regression analysis was used to determine factors affecting practices of OSH in the informal non-food manufacturing sector in Kampala City. The model

was selected because of the dichotomous nature of the dependent variable, which takes a binary form. The binary logistic model is of the form:

$$\text{In} \quad \left(\frac{P_1}{1-P_1}\right) = B_0 + B_1 x_1 + ... + B_k X_k \quad \text{.....3.2}$$

Where;

X = independent variables

P_1 = Safe

1-P_1 = Unsafe

B_0 = Constant

B_1 = Coefficient of the determinant

For each of the independent variable, one category was assigned the value of 0 and taken as the reference category in the analysis and assumed to have a minimal likelihood on the dependent variable.

Specifically, the explanatory variables in the model were;

X_1= Gender of the respondent

X_2= Age of the respondent

X_3= Education of the respondent

X_4= Type of business

X_5= Number of training sessions in relation to occupational health risk and safety hazards

X_6= Experience measured as number of years in a given informal business

X_7 = Use of PPE

X_9 =Recording of Incidents

X_{10} = Safe work practices

X_{11} = Risk identification and control

X_{13} = Awareness of workers

X_{14} = Induction of workers

X_{15} = Supervision of Workers

X_{16} = Audits

X_{17} = Inspection

X_{18} = First Aid / medical service

Table 3. 2: Summary of data analysis

Objective		Variables collected	Data analysis tool
i.	To describe occupational safety and health hazards in the informal non-food manufacturing sector in Kampala City.	Workspace environment, fire and , nature of business, types of workplace hazards, control measures,	Descriptive statistics into frequencies and percentages
ii.	To assess the occupational safety and health knowledge and attitudes on practices in the informal non-food manufacturing sector in Kampala City	Levels of knowledge, attitude and practices on employer/employee on OSH and use of PPE	Descriptive statistics; frequency tables and percentages.
iii.	To determine the factors affecting OSH practices in the informal non-food manufacturing sector in Kampala City.	Demographic variables e.g. Gender, age level of education , experience, training and awareness, type of employment, duration at work	Chi-square analysis and Multivariate regression model to determine the factors affecting OSH practices at work.
iv.	To investigate the workplace legal and policy gaps in occupational safety and health in the informal non-food manufacturing sector in Kampala City.	Occupational safety and health Laws, policies, regulations and guidelines.	Descriptive statistics in frequency tables and percentages.
v.	To evaluate the existing occupational safety and health best practices for control of hazards among the informal non-food manufacturing sector.	Awareness, training, use of PPE, safe work practices, audits, supervision and OSH management systems	Descriptive statistics percentages and frequencies
vi.	To assess the compliance levels of good occupational safety and health practices among informal non-food manufacturing sector workers.	Use of safety measures at work, use of PPE, use of safe work procedures and safety instructions	Descriptive statistics into tables and percentages and graphical

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Socio-demographic characteristics of the respondents

Data was collected from a total of 388 informal non-food manufacturing sector enterprises out of the 424 giving a response rate of 388 (92%). Majority of the respondents were male 263 (67.8%) compared to their female counterparts 124 (32.2%) (Table 4.1), a disparity that could primarily be a reflection of the economic gender disparity in the country with the fact that informal sector manufacturing is risk averse and male dominated. Women are more likely to be outworkers, unpaid contributing family workers and less likely to be employers. The number of males being higher than females is consistent with a Lagos study in Nigeria (Adebola, 2014) where the majority of respondents (90%) were male and 10% were females. Females are more likely to work at homes or on streets rather than workshops or factories (Chen, 2016). On the other hand men are more daring and risk averse hence many occupy most risk sectors in the informal sector.

A considerable proportion of the respondents 275 (70.9%) were reported married followed by singles 100 (26%). The married people are more responsible and more mindful about occupational workplace hazards and risks and can avoid the accidents due to having responsibility for dependants at home.

Results also showed that 158 (40.7%) of the respondents were aged 30 years and below while slightly less than a quarter 80 (20.6%) were aged 31-40 years, 41-50 were 79 (20.4%) and 71 (18.3%) aged above 51 years. The mean age of the respondents was 30±2.16 years. The high number of respondents aged below 30 years is expected as it is the point of career life (youth stage) that most workers start entering the job market. These are mainly the unemployed youth who comprise the biggest segment of the population, cannot find jobs in the formal sector due to lack of prerequisite skills and vocational training. They are very aggressive at workplaces, risk averse, can work under peer pressure influence hence have high chances of getting injured with fatal accidents at work. In a similar study in Kamukunji, Kenya, Keitany (2014) found the same age for the workers below 35 years in a small scale metal industry. In terms of education, a half of respondents 196 (50.5%) had attained at least some level of education equivalent to secondary level. About 103 (26.5%) had acquired primary level whereas those who

possessed higher education (tertiary/vocational) were 55 (14.2%) as well as 20 (5.2%) with degrees while those who had never attained any education level were the minority 14 (3.6%). These are young people without skills, resources who cannot get formal employment hence find refuge in the informal sector for survival.

Table 4. 1. Socio-demographic characteristics of respondents

		Number of enterprises (n=388)	
Variable	**Variable category**	**Frequency**	**Percent (%)**
Gender	Male	263	67.8%
	Female	125	32.2%
Age category	30 Years & Below	158	40.7%
	31-40 Years	80	20.6%
	41-50 Years	79	20.4%
	51 years & Above		18.3%
	Mean age	71	30 ±2.16
Marital Status	Single	101	26.0%
	Married	275	70.9%
	Divorced	08	2.1%
	Widowed	04	1.0%
Education	None	14	3.6%
	Primary	103	26.5%
	Secondary	196	50.5%
	Tertiary/Vocational	55	14.2%
	Degree level	20	5.2%
Period working in *Juakali*	1-5 Years	133	34.3%
	6-10 Years	123	31.7%
	10 Years & Above	132	34.0%
No. of employees of work	0 Employees	228	58.8%
	1-3 Employees	82	21.1%
	4 or 5 Employees	78	20.1%
Work hours/ per day	1-8 Hours	61	15.7%
	9 Hours & Above	327	84.3%
	Mean hours		1.84%
Work days per week	1-5 Days	45	11.6%
	6 Days & Above	343	88.4%
	Mean days		5±1.88

More than a quarter of respondents 133 (34.3%) had spent 1-5 and 123 (31.7) had 5-10 years working in the informal sector, while a related proportion of 132 (34.0%) had spent above 10 years of work in *Jua-kali*. Furthermore, most employers engaged themselves in their businesses thereby not employing workers 228 (58.8%) whereas employers who employed 1-3 employees were only 82 (21.1%) and 4-5 employees with 78 (20.1%). Reasons for high percentage of sole employment is due to informal sector having limited resources to pay for labour hence the enterprises owned by families and sole proprietors. Most of them 327 (84.3%) worked for 9 hours per day with only 61 (15.7%) were working for 8 hours per day. The average number of hours worked being 8±1.86 hours per day averaging 40 hours per week and 6 days 343 (88.4%) per week with a mean working rate of 5±1.88 days per week. These cause over-working leading to fatigue, stress and burnout hence resulting to psychological hazards at the workplace. The results compare with similar study in Kenya investigating how small enterprises contribute to towards household and national economy that revealed on average enterprises operating for 55 hours per week compared to the formal sector which works for forty hours in a week (Keitany, 2014).

4.2 Description of occupational safety and health hazards

Main types of hazards prevalent in the informal non-food manufacturing sector were investigated. The main activities included manufacture of metallic products, textiles and clothing, furniture, repair of machinery and equipment, paper recycling and paper products, brick and concrete products and other manufacturing as outlined in the sections below.

4.2.1. Environmental and industrial hygiene in the sampled premises

Environmental and industrial hygiene play a big role in the detection of occupational safety and health specifically in the control of environmental conditions like ventilation, lighting, safe waste disposal, general cleanliness and provision of amenities. This is achieved in most cases in form of good housekeeping, proper siting, sound construction of premises and effective enterprise management. In the study these were taken as workplace occupational safety and health indicators (facility siting, lighting and ventilation, storage and working space, provision of drinking water), provision of welfare facilities (toilets, cloakrooms, eating space), provision and use of PPE, emergency exits, good housekeeping, waste containers, Fire extinguishers and occupational safety and health regulations at workplaces.

About 218 (56.2%) of the workplaces were in the open operating in hot sun (no roof, no walls/ no structure housing the workers), 129 (33.2%) closed (enclosed in a structure with both roof and walls), 38 (9.8%) partially enclosed (only roof but no walls). This state of openness exposes workers to weather extremes. About 301 (77.8%) operational / working space (floors) surrounding the work stations were littered with rubbish and full of waste materials 338 (87.1%) did not regularly empty their waste containers while 324 (83.5%) of the working environment around the workplace was not swept. A situation that exposes workers to physical and biological hazards. Only 56 (24.7%) had appropriate roofs, 90 (23.2%) had appropriate walls and 26 (6.8%) had emergency exits free from obstruction. The informal sector is awash with many hazards arising from the location and physical environment. This is because the sector does not have the necessary resources to invest in good structures for their businesses, the root cause is lack of regulation and support of the sector by government.

In terms of welfare, only 19 (4.9%) had sanitary facilities, 04 (3.6%) had resting facilities and 08 (2.1%) running water. Fire precautions were almost non-existent with only 25 (6.4%) having fire provisions. The low provision of welfare facilities is a result of lack of resources and OSH regulations in the sector. A study in Accra and Takoradi, Nigeria, Alfers, (2009) found out that market fires, poor sanitation, lack of sufficient storage facilities, physical and psychological effects were among the major risks affecting the informal economy.

These findings concur with the Auditor General's Report (GoU, 2016a) where an audit of the Department of Occupational Safety and Health (DOSH) in 50 sampled enterprises in Uganda found out that 80% of the enterprises were non-compliant with written OSH policy, 82% were without clear fire exits, 72% had no fire alarms in place, 84% did not carry out fire drills to their staff, and 80% without First Aid boxes on the premises. The general situation was that only 20% of the enterprise having adequate occupational safety and health services in Uganda. The report attributed poor compliance on inadequate staffing, inadequate awareness and sensitisation, limited logistics, absence of national OSH policy and lack of OSH Laboratory to analyse exposure measurements and test PPE equipment (GoU, 2016a).

The results are also consistent with a similar study by the National Institute of Labour Protection in Vietnam (Nguyen, 2010) that showed 70% of production workshops

being unsafe and 80-90% not clean. This is however, in contrast with a study in Nairobi that found adequate drinking water (97.7%) at the workplace, food cafeteria available (98.5%) and resting space inadequate (38.6%) at workplaces. While toilets were also adequate (98.1%) but waste disposal was inadequate (only 8%) and drainage (12.3%) (Keitany, 2014). The situation in Nairobi was in a regulated formal setup where there is enforcement and supervision of OSH services as compared to the unregulated informal sector in Uganda.

It is evident that most of the enterprises operate in the open and do not have the necessary occupational safety and health services and facilities. In most developing countries the informal sector is found in marginal lands usually un- regulated and without municipal services, this exposes workers to unhealthy and unsafe environments. Lack of regulations mean that the informal sector operates in the dark without OSH monitoring and supervision. The sector is poor and cannot access funding from government and other agencies making them to have poor or no facilities which in turn affect occupational safety and health.

4.2.2 Occupational safety and health hazards identified in the study area

About 63 (16.2 %) of the sampled premises comprised of manufacture of metallic products with activities of metal cutting, fabrication, flame gouging, welding, blazing, rolling, cutting, grinding and soldering. Metal products included window and door frames, beds, playing structures for nursery schools, chairs, tables, metallic gates, water tank stands among others. The main hazards included excessive optical radiation 55 (44%), inadequate ventilation 66(50.4), unsuitable lighting 48 (39.3%), metal sharps edges 67 (18.5%), metal fumes 41 (13.8), noxious gases 91 (26.7%) and manual lifting of heavy loads 67 (19.5%). The sector operates in the open and relies heavily on chemicals for finished products, using heavy and bulky raw materials and finished product. Most of the chemicals used are volatile and hence have health risks when inhaled by the workers who do not have PPE.

About 89 (23%) of the enterprises were in the furniture industry. This was the next dominant activity with sections like making of wood products e.g. doors frames and shutters, chairs, beds, tables, bookshelves, cupboards. The machinery ranged from planing machines, thicknessers, circular sawing machines, power saws, moulding machines, mortising machines, grinding machines, furnishing sprayers. The main tasks in the

furniture industry included; sawing of timber, splitting, cutting, jointing, dusting, grinding, planing and moulding of timber pieces, vanishing of finished products. Machine sawing of logs into timber, happens in most cases in the open and dilapidated workplaces. The sector was dominated by men with the age of 30 years and below. Hazards in the furniture industry comprised of extreme heat 56 (27.1%), inadequate ventilation 52 (39.7%), gases 72 (21.1%) and chemicals / paints 66 (19.5%). It also had mechanical sharps 77 (21.3%). This is because the sector operates in the open, heavy reliance on chemicals for finished products and uses electric equipment in most of the work as well as using bulky raw materials and finished outputs. The chemicals have health implications to workers especially when there is no usage of PPE.

Manufacture of textiles and clothing entailed 155 (40%) of the premises and were in designated clusters zones, markets, verandas and other business premises while others are found in residential homes. Work processes were labour intensive, involving long hours of standing particularly for workers designing, cutting, ironing and sitting for machinists who do sewing work. . This particular sector is dominated by young women below the age of 30 years, these are the unemployed urban youth without skills and formal employment. Hazards in this sector included; repetitive movements from manual sewing machines 35 (9.6%), fumes from ironing old clothes 40 (11.7%), extreme heat 31 (15%). Some of tailors operate from verandas of other business establishments.

Concrete and brick products comprised of 12 (3.0%) making of both unburnt and burnt bricks, slab making, concrete culverts, balcony stands, concrete pavers and cement building blocks among others. Tasks include clay preparation, moulding of bricks, seasoning of mud, mixing of cement with sand, casting of blocks and pavers, stacking of bricks and blocks, burning of dry bricks, loading of brick and concrete products manually onto lorry trucks. Most of the tasks are done outside standing the whole day in the open yards and wetlands. All the workers here are exposed to extremes of weather 38 (18.4%), and extreme optical radiation 47 (37.6%). The sector operates from the open air and hot sun, working without any PPE. The sector was dominated by males of ages below 30, 31-40 and 41-50 years. The latter 41-50 being owners of the enterprises.

Repair of machinery and equipment was 19 (5.0%) of the sampled enterprises. These were involved in repair of television sets and radios, repair of cars and motor cycles. Main tasks consisted of dismantling of equipment and reassembling, soldering,

panel beating of cars, wiring, applying filler, oiling, greasing, sand papering, painting, spraying, fixing of parts and manual heavy lifting. This is mainly done in markets, back yards and open garages. The sector was dominated by men, most of them apprentices. The age category in this particular sector was mainly below 30 and 41-50 years. They were fairly educated to secondary level and self-employed. It had the least hazards due its nature of being in housed places and using small equipment. However, it was affected by inadequate lighting 21 (17.2%) and inadequate ventilation 14 (10.4%) due to confined spaces.

Paper recycling and paper products comprised of 23 (6%). These were using paper materials while others were recycling paper both in homes and shops. The tasks include the design and printing of advertising and packaging materials, making of paper bags, stitching and gluing of books and digital printing with computers. They use different types of ink and colours for the finished products. Most of the machinery is of the old technology which requires maintenance. Maintenance is by use of petrol and thinners. Most of the work is done standing all the time in confined spaces with poor ventilation and artificial lighting. Main hazards included; unsuitable lighting 41 (33.6%) and excessive optical radiation 30 (24%). This is due locations in confined spaces and high intensity electric light in the Printers.

Other manufacturing was the least with 12 (3%) included crushing of stones into aggregates, extraction of stones from the quarries, cutting of building stones, making of ear rings and necklaces from cattle bones and making of mats. These sector was mainly dominated by women and men in the ages of 51 years and above. Most of them were in the open exposed to weather extremes 29 (14%), respective movements in carrying materials 41 (11.2%). They are found in the open without PPE, while some like the making of ear rings were in a good structures with equipment but the raw materials which are from cattle bones are picked from waste dumps hence present biological hazards.

4.2.3 Types of occupational hazards in sampled informal sector premises

Basing on the several methods used in assessing the working conditions and practices which included the hazard identification checklist, interview of the workers and employers a number of occupational safety and health hazards were identified. These included physical, chemical, biological, ergonomical and psychosocial hazards. Analysis of specific hazards exposure was done to determine the relationship on the different work

type categories. The results indicated high exposure of hazards mainly in the manufacture of metallic products, furniture and textiles and clothing sub-sectors (Figure 4.1).

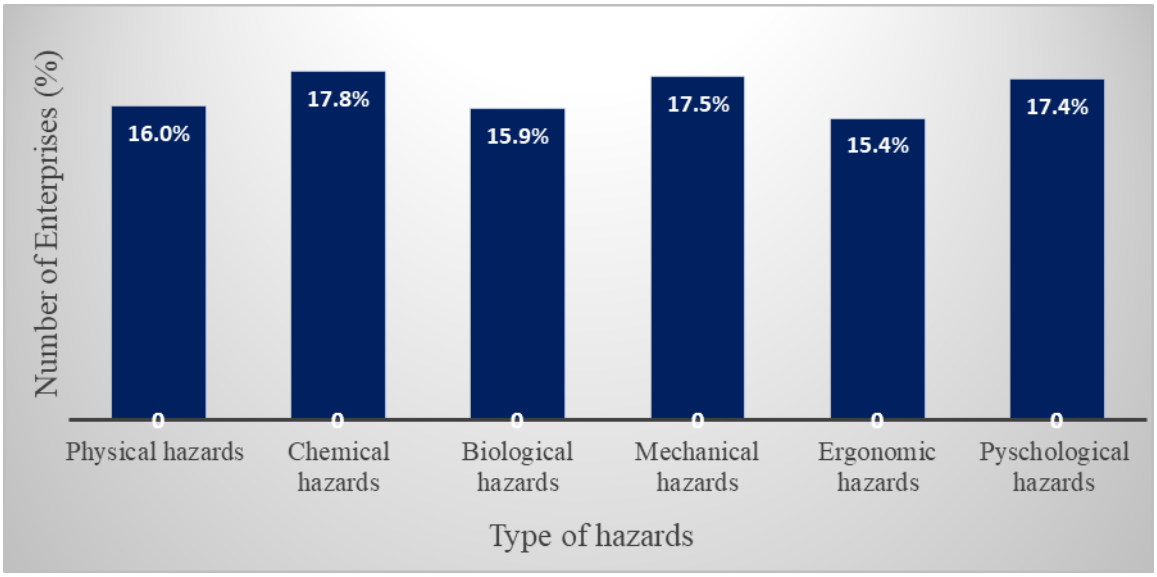


Figure 4. 1. Types of hazards identified in the study area

From the figure above, all types of hazards are prevalent in the informal non-food manufacturing sector. Chemical hazards were highest with 69 (17.8 %) this is because of the grave dangers associated with chemicals especially in the welding and fabrication without good knowledge, furniture making and car repair resulting from volatile paints, thinners and furnishes. The chemicals are volatile chemicals with health implications to employees where PPE is not constantly used. This is followed by mechanical hazards with 68 (17.5%) as a result of machines and equipment used without guards causing high level risk to workers. Physical and biological were 62 (16 %) and 62 (15.9%) respectively while ergonomic hazards accounted for 60 (15.4%). However, these hazards ranged from high, medium and low in the different sectors. For example, mechanical and chemical hazards were rated high risk in the welding, fabrication and furniture firms while moderate risks were found to be in the repair of machinery and equipment, concrete and brick making, and low risk associated with textiles and clothing. These hazards are typical as shown by Nag *et al*. (2016) who got poor working conditions and high exposure to hazardous substances in the informal sector. Poor work organization, poor access to clean water and sanitation, ergonomic hazards, strenuous hand tools, exposure to dust and chemicals as major risk factors identified in the African informal sector. These hazards were also

classified by Mock *et al.* (2005) into chemical, physical, mechanical, biological, ergonomical and psychological.

Similarly, these same types of hazards were identified by Goetsch (2011), who states that the environmental stressors on which industrial hygiene focus can be divided into four broad categories: chemical, physical, biological and ergonomical hazards. The author further stated that typical chemical hazards include; mists, vapours, gases, dusts and fumes; physical hazards include noise, vibration, extreme temperatures and excessive radiation (electromagnetic or ionising). Biological hazards come from moulds, fungi bacteria and insects which may be introduced to the workplace through sewage, food waste, water or insect droppings/infestation, while ergonomic hazards are related to the design and condition of the work place, poorly designed tools and workstations.

The situation is consistent with ILO, (2013a) which states that the 21st Century worker continues to be exposed to numerous physical, chemical, biological, ergonomic and psychological hazards. This is also supported by Ngowi (2013) who contends that workers in Tanzania are exposed to numerous safety and health hazards which are physical, chemical, biological, mechanical, ergonomic and psychological but however, adds that workers view hazards as part of their life and at times take no precautions to prevent them. This fatalism may be dismissed due to lack of information and ignorance or superstition, as the case with the informal sector.

4.2.3.1. Physical hazards

The manufacture of products comprised of metallic beds, metallic school boxes, window and door frames, playing machines for schools, house hold utensils among others the physicals hazards identified in the sampled premises are shown in Table 4.2.

Table 4. 2: Physical hazards in the study area

	Physical hazards (n=388)							
Type of enterprise	**Extreme heat n (%)**	**Extreme weather n (%)**	**Extreme noise n (%)**	**Excessive optical radiation**	**Unsuitable lighting n (%)**	**Inadequate ventilation n (%)**	**Body vibration n (%)**	**Slippery floors n (%)**
Metal fabrication and welding	71 (34.3%)	88 (37.4%)	79 (27.9%)	55 (44%)	48 (39.3%)	66 (50.4%)	15 (5.5%)	36 (12.6%)
Manufacture of Furniture	56 (27.1%)	44 (18.7%)	61 (21.6%)	41 (32.8%)	19 (15.6%)	52 (39.7%)	25 (9.1%)	14 (4.9%)
Textiles and clothing	31 (15%)	27 (11.5%)	40 (14.1%)	23 (18.4%)	22 (18%)	10 (7.6%)	20 (7.3%)	34 (11.9%)
Concrete and brick making	38 (18.4%)	19 (8.1%)	72 (25.4%)	47 (37.6%)	0%	0%	19 (6.9%)	16 (5.6%)
Paper making and recycling	11 (5.3%)	23 (9.8%)	61 (21.6%)	30 (24%)	41 (33.6%)	24 (18.3%)	33 (12%)	20 (7%)
Repair of machinery	0%	19 (6.9%)	0%	0%	0%	0%	0%	0%
Other manufacture	29 (14%)	19 (8.1%)	33 (11.7%)	11 (8.8%)	21 (17.2%)	14 (10.7%)	08 (2.9%)	37 (12.9%)

The most hazardous subsector was manufacture of metal products with inadequate ventilation and excessive optical radiation 66 (50.4%) and 55 (44.0%) of the sampled premises. This is as a result of using confined spaces and radiation from the welding torches. Other rampant physical hazards were; extreme weather 88 (37.4%) in the metal production and inadequate ventilation 52 (39.7%) in the manufacture of furniture. The inadequacy of ventilation in the furniture sector is due to cluster centres used for furniture. While the least hazards sector was the repair of machinery and equipment with 19 (6.9%) of the sampled premises, the reason for being less hazardous is due to less use of machines and electrically powered equipment. This findings concur with a European Survey (Pascal *et al*., 2000) where craft workers experienced high exposures of noise (84%), vibration (59%) and a similar one in North Central Nigeria that identified extreme heat (9.6%) and electrical shock (23.2%) as physical hazards (Osagbemi, 2010). Ametepeh *et al.* (2013) state that in mechanical workshops, heavy industrial and manufacturing environments, noise, vibration, ionising and non-ionising radiation can affect health of workers adversely. In a Zambian study, Siziya *et al*. (2013) found out that workers were exposed to a broad range of occupational health hazards that included vibration from hand / machinery tools, high and low temperatures, smoke, fumes, powder, dust inhalation and noise. This shows that developing countries informal sector may have similar conditions and hence exposed to similar occupational safety and health hazards.

According to a study in South Africa, (Mogane *et al*., 2013) traders in the informal sector are exposed to physical hazards including thermal and cold stress, noise, vibration and ultra violet radiation. Those in panel beating and spray painting, carpentry, aluminium and steel workshops, upholstery industries are exposed to high levels of noise and hand-arm vibration, while traders from central business districts are exposed to continuous background noise from traffic and other activities.

In addition, several studies conducted in small garment industries in India (Parimalam *et al*., 2007) show workplaces located in small confined places with inadequate ventilation and lighting, excessive noise, overcrowding and poor housekeeping. The informal non-food manufacturing sector is full of physical hazards yet little or no PPE is used. And for those who have personal protective equipment, the quality is inferior and inappropriate type hence the protection is pseudo.

4.2.3.2. Chemical hazards

Closely linked to physical hazards is the exposure to chemical hazards. Apart from the concrete and other manufacturing, all the other sector respondents mentioned exposure of chemical hazards experienced as part of the daily work (Table 4.3).

Table 4. 3: Chemical hazards in the study area

	Chemical hazards (n=388)			
Types of enterprise	**Metal fumes n (%)**	**Solvents used n (%)**	**Chemicals /paints used n (%)**	**Gases /fumes generated n (%)**
Manufacture of Metal products and welding	41 (13.8%)	27 (8.6%)	51 (15%)	91 (26.7%)
Manufacture of Furniture	48 (16.2%)	53 (16.9%)	66 (19.5%)	72 (21.1%)
Textiles and clothing	14 (4.7%)	09 (2.9%)	13 (3.8%)	40 (11.7%)
Manufacture of Concrete and brick Products	26 (8.8%)	15 (4.8%)	17 (5%)	80 (23.5%)
Paper making and recycling	0%	33 (10.5%)	49 (14.5%)	27 (7.9%)
Repair of machinery and equipment	17 (5%)	0.0%	0.0%	10 (2.6%)
Other manufacturing	41 (13.8%)	17 (5.4%)	26 (7.7%)	22 (6.5%)

Chemical hazards were mainly prevalent in the manufacture and fabrication of metal products, gases generated from welding were 91 (26.7%) this particularly due to the use of welding torches without using the welding booths, while concrete and brick making was 80 (23.5%) of the sampled enterprises this particularly due the burning of bricks with wet firewood. Among the carpenters and metal fabricators, some of the poisonous chemicals

used included; paint additives, gasoline, solvents, isocyanates and other volatile organic compounds. The toxicants as well as the radiation of light resulting from the use of these chemicals for welding, abrasive cleaning, fusing of vehicle parts together and spraying activities pose significant health hazards to the workers, this was also echoed by the National Institute of Occupational Health (2012).

Goetsch (2011), states that typical chemical hazards include; mists, vapours, gases, dusts and fumes. Heavy exposures to chemical hazards are most prevalent in industries that use, make and process metals and paints in the manufacture of consumer goods, production of textiles, artificial fibres and cleaning industries (Ametepeh *et al.*, 2013). Strong smell of paint vapours, paint removers and thinners are noted during mixing and spraying of chemicals on finished products (Mogane *et al.*, 2013).

Similarly in a study by Spies (2008), spray painting workers were found to be exposed to high concentrations of isocyanide fumes from paraffin and liquid petroleum gas, used for cooking in kitchens that result into indoor pollution. Exposure to welding fumes that are a complex mixture of hazardous chemical substances were noted in the welding industry. In car, mechanic and upholstery industries, workers are exposed to oil and grease. While in the aluminium and glass works, workers may be exposed to aluminium, copper and glass dust released during cutting operations. Cobblers and carpenters are exposed to leather and wool dust.

In a garment factory in Lesotho (Jonathan, 1997), cotton fabric dust exposure levels were well above the recommended limits. A similar survey in small industries in homes in Thailand found out that workers were exposed to dyes, dust and worked without PPE (Chavalitnitikul, 2003). Generally, there is little information and awareness about chemicals being used in the informal sector in developing countries

4.2.3.3. Biological hazards

Biological hazards arise from biological agents and may include bacteria and fungi. Others may include scorpions, spiders and wasps. Moulds are virtually found everywhere where there is moisture and organic matter. Exposures occur via inhalation of contaminated air, consumption of contaminated food and touching infected materials. Biological hazards 281 ((72.4%) arose from moulds. Especially in the furniture manufacture where they use poorly seasoned timber.

Geotsch (2011) alludes to this as biohazards coming from moulds, fungi bacteria and insects which may be introduced to the work place through sewage, food waste, water or insect droppings/infestation. Biological hazards in the informal non-food manufacturing arise from the raw materials like wood or timber, poor sanitation, poor waste disposal (saw dust), flowing sewage and infestation of vectors. In a study carried out in Nairobi, Kenya by Keitany (2014), biological agents (68.5%), included bacteria, animals, fungi and viruses. These were mainly found in the furniture and textile manufacturing due to the use of poorly seasoned wood and timber and old clothes. Biological hazards can also arise from workplaces without sanitary facilities and lack of handwashing exposing people to the oral-faecal infections. Most of the informal non-food manufacturing workplaces are located in poorly drained areas, poorly served with waste storage and sewerage facilities. This become sources of biological agents and disease to the workers.

The findings further concur with a South African study (Mogane *et al*., 2013) where most of the informal sector establishments are located in makeshift structures, open spaces, road reserves, wetlands/ marginal lands and poorly planned premises without toilets, running water, means of solid waste disposal and blocked drainage systems. Similarly, Theuri (2012) contends that the conditions under which most informal workers operate are precarious and unsafe. Many operate in ram-shackled structures, lack sanitary facilities or potable water and poor waste disposal while Karanja *et al*. (2003) found out that poor maintenance of ablution facilities and unhygienic water accumulation on the floor, overflowing waste bins lead to possible exposure of hazardous biological agents and nuisance smells from blocked storm drainage systems.

4.2.3.4. Mechanical hazards

Mechanical hazards are hazards associated with power-driven machines, whether automated or manually operated. The use of machines and equipment hazards included sharps or edges of machines. Results are shown in Table 4.4.

Table 4. 4: Mechanical hazards in the study

	Mechanical hazards (n-= 362)	
Types of enterprise	**Mechanical sharps/ edges n (%)**	**High powered force n (%)**
Manufacture of Metal products	67 (18.5%)	86 (25%)
Manufacture of Furniture	77 (21.3%)	66 (19.2%)
Textiles and clothing	24 (6.6%)	45 (13.1%)
Concrete and brick making	50 (13.8%)	15 (4.4%)
Paper making and recycling	21 (5.8%)	35 (10.2%)
Repair of machinery and equipment	54 (15.0%)	0.0
Other manufacturing	17 (5.2%)	20 (5.5%)

Mechanical hazards were prevalent in metal fabrication and welding sector with high powered force 86 (25%) and mechanical sharps /edges 67 (18.5%) of the sampled premises. This is attributed the use of metals and electric equipment in the manufacture of metal products. Furniture production was second to metal production with sharp edges 77 (21.3%) and high powered sources 66 (19.2%) of those sampled. These comprised the most dangerous hazards to workers in the informal sector. Since most of the machines were not protected with safety gadgets they can cause high level of risk to workers. The least hazardous sector was the repair of machinery and equipment with sharps 54 (15%) and no use of electric power in most of the repair work. In the informal non-food manufacturing sector the machines being used were; drilling machines, power saws, cutting machines, planing machines, moulding machines punching machines among other. These injuries have

been stated by Goetsch (2011) as common mechanical injuries resulting from cutting, tearing, shearing, crushing, breaking, straining, punching and many others.

According to Goetsch (2011), safeguards can be broadly categorised as point-of-operation guards, point-of-operation devices and feeding/ injection methods. Others are robot safeguards, lock out and tag out systems. However, most of the technology in the informal non-food manufacturing is out dated and does not have machine guards and where they exist they may be out of service, broken and not under use due to lack of knowledge and poor attitude.

4.2.3.5. Ergonomic hazards

Ergonomic hazards are hazards that result from the nature of work and its organization and result from the design and condition of the workplace, poorly designed tools and work stations. They relate to how a workplace, the equipment used and the work environment itself contribute adversely to comfort, efficiency, safety and productivity.

Table 4. 5: Ergonomic hazards in the study area

	Ergonomic hazards			
Type of enterprise	Heavy lifting. carrying n (%)	Confined space n (%)	Repetitive movements n (%)	Uncomfortable postures n (%)
Metal fabrication and welding	76 (19.5%)	70 (18.8%)	52 (14.2%)	21 (5.5%)
Manufacture of Furniture	59 (17.2%)	47 (12.6%)	45 (12.3%)	13 (3.4%)
Textiles and clothing	15 (4.4%)	30 (8.1%)	35 (9.6%)	28 (7.3%)
Concrete and brick making	34 (9.9%)	16 (4.3%)	25 (6.8%)	10 (2.6%)
Paper making and recycling	19 (5.5%)	29 (7.8%)	31 (8.5%)	20 (5.2%)
Repair of machinery and equipment	0%	0%	0%	0%
Other manufacturing	16 (4.7%)	45 (12.1%)	41 (11.2%)	19 (5.0 %)

In the study, the most prevalent ergonomic hazards (Table 4.5) arose from heavy lifting and carrying of raw material and bulky finished products in metal production 76 (19.5%),

confined space 70 (18.8%) and repetitive movements 52 (14.2%) and heavy lifting in furniture production with 59 (17.2%) of the sampled premises. This is as a result of using heavy raw materials and making of bulky finished products. The least sector with ergonomic hazards was repair of equipment and machinery. In many instances in the clothing and textile sector, proper ergonomic chairs were unavailable and workers were observed sitting on makeshift seats such as crates of soda, wooden stools, wooden boxes and buckets. According to Ross (1994); Westgaard and Winkel (1997), poor workplace designs, awkward body mechanics or postures repetitive movements and other ergonomic hazards induce or contribute to a staggering number of cumulative and musculoskeletal trauma disorders.

Approximately, 30% of the workforce in developed countries and between 50-70% in the developing world are exposed to heavy physical workloads or ergonomically poor working conditions involving lifting and moving heavy loads or repetitive manual tasks (Ametepeh, 2013). The findings are consistent with a study in Tamil Nadu, India (Parimalam *et al.,* 2008) where work in the garment industry was highly repetitive, time-pressured, high paced tasks, inappropriate work stations and designs, bad chairs and poor postures resulting into high rates of Musculo-Skeletal Disorders (MSDs) among machinists in the industry. According to Mogane *et al*. (2013), working in awkward positions as a result of poor work station designs was observed in traders lifting heavy loads and at times over long distances. The informal sector lacks awareness about ergonomic hazards and do not have the necessary means of getting properly designed equipment and space for the work hence exposed greatly this type of hazards.

4.2.3.6. Psychological hazards

Psychological risks are defined as those aspects of work design, the organization and management of work, and their social and environmental context, with the potential for causing psychological, social or physical harm. They have been identified as being among the major contemporary challenges for occupational safety and health today and linked to work-related stress, violence and bullying. Results from the study showed psychological hazards being high in the manufacture of metal products (stress 105 (30.5%) which arise from all the sub sector and manufacture of furniture (exhaustion 126 (36.6%) in the sampled premises. This is a result of long working hours and working above six days per week (Table 4.6).

Table 4. 6: Psychological hazards in the study area

	Psychological hazards	
	Stress	**Fatigue/exhaustion**
Type of enterprise	**n (%)**	**n (%)**
Metal fabrication and welding	105 (30.5%)	96 (27.9%)
Manufacture of Furniture	93 (27%)	126 (36.6%)
Textiles and clothing	71 (20.6%)	57 (16.6%)
Concrete and brick making	15 (4.4%)	29 (8.4%)
Repair of machinery and equipment	60 (17.5%)	36 (10.5%)
Paper making and recycling	33 (9.6%)	18 (5.2%)
Other manufacturing	27 (7.8%)	18 (5.2%)

Psychological hazards arise mainly due to time pressure and meeting delivery deadlines. The least hazardous sector with psychological hazards was other manufacturing, having stress in only 27 (7.8%) and fatigue / exhaustion in 18 (5.2%) of the sampled premises. Other manufacturing consisted of making of mats, stone crushing and making of jewellery (earing) from bones. The reasons for low hazards is mainly due low volumes produced and working solely as sole proprietors in the informal sector. The results concur with the Organization of African Trade Union Unity (OATUU, 2000), which states that psychosocial hazards cause fatigue, stress, burnout and general loss of interest in work. Monotonous work which requires constant concentration, irregular working hours and working in violent situations can cause adverse psychological effects to workers.

Similarly, Lindstrom (2003) argues that psychological factors including time pressure, social interactions at work, worker ability to control situations and non-availability of amenities such as eating rooms, rest corners and toilets are all sources of stress for workers as they influence their wellbeing. Where not optimally provided these conditions become psychological stressors manifesting themselves into fatigue, depression, irritability, job dissatisfaction and insecurity. The lack of adequate job security and presence of unscrupulous investors decrease the sense of physical security felt by workers. Some conditions that informal traders tolerate include violence by customers as a result of the latter being dissatisfied with the quality of the product, theft and occasional confiscation of their products by government officials. A study among saw millers in Nigeria found out that

workers who spend more than 8 hours a day doing the same job over the years' experience stress (Osagbemi *et al*., 2010).

The findings concur with a study in Ghana (Ametepeh *et al.,* 2013), where poor working conditions had physical effects and psychological repercussion that usually resulted into social and mental problems. This was similarly advanced by a study in Uganda (Ndejjo *et al.,* 2015) which found out that long working hours can result in prolonged exposure to hazards and limited recovery time which translates into physiological depletion that continues the following day. However, most of these hazards are not known in the informal sector due to limited knowledge and hence not addressed. They mainly manifest into social and mental problems in society.

4.2.3.7 Other hazards

Other hazards were summarized from the workplace checklist and these mainly arose from poor sanitation of the workplaces, results indicate lack or inadequate sanitation facilities where they exist in the informal non-food manufacturing sector and most respondents revealed that inadequate drinking water in their businesses with only 60 (15.5%). However, toilet/latrine was reported to be absent and as well inadequate in most of the facilities 74 (19.1%). Also resting places were found to be inadequate with only 67 (17.3%) as most enterprises lacked such amnesties, the waste disposal (domestic) was inadequate with 64 (16.5%) as well as drainage of workplaces with only 38 (9.8%). This is supported by Mogane *et al*. (2013), who found that the informal sector lacks welfare facilities and services. Sanitation facilities are non-existent at road side and open air enterprises.

Sanitation facilities are a result of engineering controls provided to workplaces during construction. The informal non-food manufacturing has inadequate sanitary facilities at the workplaces. The workers incur personal costs to get sanitary / welfare services like toilet / latrine, getting drinking water, employees have to cope-up with the situation that may results into psychological hazards of stress, fatigue, burnout, poor personal and environmental hygiene, a precursor for many occupational injuries and illnesses. The findings further concur with Mogane *et al*. (2013) who found out that most of the informal sector establishments are located in makeshift structures, open spaces, road reserves, wetlands/ marginal lands and poorly planned premises without toilets, running water, means of solid waste disposal and blocked drainage systems. These provide breeding places for vectors and produce intolerable stench to workers. Sanitation facilities are non-existent at roadside and open air enterprises.

Workers near rivers face additional problems of mosquito bites, malaria fever and poorly lit and ventilated workplaces. There is lack of safe drinking water and washing facilities. Karanja *et al*. (2003) state that poor maintenance of ablution facilities and unhygienic water accumulation on the floor, overflowing waste bins lead to possible exposure of hazardous biological agents and nuisance smells from blocked storm drainage systems.

Fire hazards were also imminent in the informal non-food manufacturing sector. From the checklist results, most respondents agreed that fire extinguishers were important at workplaces in control of fire outbreaks with 267 (67.6%). It was evident especially in the furniture industry and garages (repair of machinery) that fire could easily break out, however there were no fire extinguishers, fire alarms to mitigate this in case of an emergency. Causes of fires are electrical incidents, unattended charcoal stoves left behind and suspected arson activities. This concurs with Mogane *et al.* (2013), who established that most of the informal establishments are poorly located, cannot be easily accessed by firefighters and most of them do not have fire hydrants and extinguishers to quickly control the fire outbreaks, the same study also found out that fire hazards result from the use of paraffin, Liquefied Petroleum Gas, unsafe electrical connections and heaters, coupled with clutter of boxes and other inflammable materials in stalls. Lack of firefighting appliances means that a number of fire outbreaks cannot be controlled.

The above findings on occupational hazards concur with Burton (2010); Mogane *et al*. (2013) who state that the Informal sector workers operate in inhumane conditions and makeshift places without sanitary facilities, examples of such environments include; road reserves, informal market places, wetlands / marginal lands and poorly serviced homes, all of which can expose the workers to environmental hazards and disease, traffic accidents, fire hazards, crime, assault and weather related discomfort and muscular- skeletal injuries. Lund *et al*. (2016), agree that informal workers operate in atypical and nonstandard workplaces that are excluded by definition, from occupational safety and health protection measures.

Prevalence of hazards in the informal non-food manufacturing sector showed respondents involved in an accident at work in last one year 176 (45.4%), occupational work disease 205 (53.4%). Of those affected 292 (75.5%) sought treatment in private health facilities and of those who sought treatment 48 (12.4%) had workplace health and safety awareness. The findings are in tandem with a study in Uganda by Kintu *et al.* (2015) cited in Hamalainen *et al.* (2005) which state that management of occupational safety and health

issues at workplaces continue to be left unattended by different sectors of government and the private sector. The main challenges facing occupational safety and health in developing countries is lack of funds and inadequate manpower.

The survey revealed that the most common hazards are physical, chemical, mechanical, ergonomical and psychological hazards. They are found mainly in the metal fabrication and production, furniture and textiles and clothing. This is attributed to the use of electric equipment / machinery, use of chemicals and solvents and being in the open. The least hazardous sectors are concrete and brick making where most of the work is not mechanised or powered and repair of machinery and equipment without the use of chemicals. The machinery and equipment being repaired are domestic equipment and motorcycles. Biological hazards were highest in clothing and textiles arising from the use of second hand clothes where they are not well disinfected/disinfested.

The informal non–food manufacturing sector is a haven of physical, mechanical, chemical, biological, ergonomical and psychological hazards without risk assessment and inadequate occupational safety and health management despite the abatement efforts from the sector. The most hazardous sectors being manufacture of metal products and furniture. The least hazardous sector was found to repair of machinery and equipment and other manufacturing. There are a lot of incidents, ill health, injuries and accidents in the informal sector which are not recorded, managed, reported and currently no management information system is in place at regulatory level to address the situation which information is key for planning reporting and effective intervention.

4.2.4 Control measures of occupational safety and health hazards

Control of occupational safety and health hazards at work is important in the sustainability of enterprises in the informal sector. An assessment was made about the control measures being carried out in the informal sector. The measures included training and awareness, provision of PPE, use of fire extinguishers, hazards identification and occupational safety measures like supervision, risk assessment, incident recording and reporting among others (Table 4.7).

Table 4. 7: C**ontrol measures of occupational safety and health hazards in the study area**

Occupational health measures by employer	Percent n (%)
Training and awareness	78 (20%)
Adequate/appropriate use of PPE	205 (52.8%)
Fire Extinguishers	124 (32%)
Hazard Identification	39 (10.1%)
Occupational safety measures	100 (26%)
Good housekeeping	211 (54.4%)
Incident reporting and registering	41 (10.6%)
Ensure adequate supervision	69 (17.8%)
Carrying out risk assessment	48 (12.4%)
Workplace Insurance	36 (9.5%)
Exhaust systems effectively removing the dust	07 (1.8%)
Eye protection being used	43 (11.1%)
Instructions displayed on the machinery	17 (4.6%)
Employees using PPE at the workplace	24 (6.2%)
Guards mounted on the machines	20 (5.2%)
Tools used clean and sharp	39 (10.3%)
Carried in suitable containers	39 (10.3%)

The most practiced control measures of occupational safety and health hazards were use of PPE and good housekeeping 205 (52.8%) and 211 (54.4%) respectively while the least was lack of machine guards. The PPE preferred was mainly the aprons which were cheap, self-procured and in most case inappropriate. PPE would be appropriate in control of hazards if the right gear was procured and used regularly. However, it is the last resort in the hierarchy of prevention. The most effective control measure is good housekeeping which involves daily cleaning, proper stacking and arrangements at work and proper storage of raw materials and finished products. This is an administrative function to have a properly organised workplace. Although PPE was provided it was being bought by the workers themselves not the employers, more so of inferior quality and inappropriate. Training and awareness which is very key in the occupational health and safety was however very low 78

(20%). This is probably as a result of lack of resources and knowledge on occupational safety and health of the employers, lack of regulation and enforcement from the regulatory agencies. Control measures like fire extinguishers, incident reporting and hazard identification and risk assessment were not being applied due to lack of awareness, knowledge and training.

Table 4. 8: Safety of machinery in the study area

Safety measure	**Yes** **n (%)**
Eye protection being use	43 (11.1%)
Instructions displayed on the machinery	18 (4.6%)
Employees using Personal Protective equipment at the workplace	24 (6.2%)
Exhaust systems effectively removing the dust	07 (1.8%)
Guards mounted on the machines	20 (5.2%)
Tools used clean and sharp	40 (10.3%)
Carried in suitable containers	40 (10.3%)

In terms of safety of machinery at the workplaces, 345 (87.6%) of the workplaces did not use eye protection, 370 (95.1%) did not read the instructions displayed on the machinery, 92.8% did not use PPE, 381 (94.6%) did not have workplace exhaust systems, 368 (93.3%) did not use the guards mounted on the machinery, and 34 9 (89.4%) had dirty and blunt tools while 348 (89.2%) had no tool boxes for carrying their tools. The reasons for not complying with the measures is partly due to lack of information, lack of resources and lack of regulation. These findings were similar to Buhlebenkosi *et al*. (2013) who observed that in most cases the machines and equipment used in trades were old and most of them unguarded. The danger of moving parts was eminent, with high noise levels emanating from machines during operation.

Anogono *et al*. (2010), in a study conducted in Raghistan, reported the use of safety measures during working hours as not adequate to prevent hazards and the non-use of safety measures is primarily associated with non-availability and non-affordability of the devices in the market. These findings indicated that there was knowledge on preventive measures of occupational safety and health hazards in the informal non-food manufacturing sector but the applicability and use varies according to the activities being carried out. Goetsch (2011),

states that the fundamentals of hazard prevention and deterrence include; elimination of the source of the hazard, substitution of less hazardous substances, reduction of the hazard at source, removal of the employee from the hazard, isolation of the hazard, dilution of the hazard, application of management practices, (administrative controls), use of personal protective equipment, training and practice of good housekeeping.

Occupational safety and health management in the informal non-food manufacturing sector is inadequate save for the self-initiatives like; good housekeeping, minimal supervision, inadequate and inappropriate use of PPE that are not supported or enforced by the responsible agencies due to non-regulation. There is low awareness, no training, no enforcement and inspection of the informal non-food manufacturing sector in Kampala City.

4.2.5 Availability and use of PPE at workplaces in the study area

Personal protective equipment /clothing are gadgets used to protect the human body from hazards. Provision and use of PPE included the overalls, safety boots, masks and ear plugs to mention but a few (Table 4.9) summaries the findings.

Table 4. 9: Availability and use of personal protective equipment in the study area

Availability and use personal protective equipment /clothing	Yes n (%)
Overalls/ aprons	59 (15.2%)
Safety boots	23 (5.9%)
Hardhats	15 (3.9%)
Nose masks	10 (2.6%)
Ear plugs	14 (3.6%)
Hand gloves	08 (2.1%)
Eye glasses	34 (8.8%)
Fire safety equipment	10 (2.6%)
First Aid boxes	06 (1.5%)

Information on the provision and use PPE show that there is inadequate provision and use of PPE in the informal sector as shown by use of overalls 59 (15.2%), use of safety boots 23 (5.9%), use of hard hats 15 (3.9%) and use of noise masks only 10 (2.6%) in the sampled premises. This is due to the fact that most trades are small time businesses want to save

money and can rarely invest in PPE. The inadequacy is therefore attributed to cost of the equipment. The choice and quality of personal protective equipment where it existed was of inferior quality. Most of the PPE worn was not of industrial material and therefore fell short when it came to actual protection. This was consistent with Buhlebenkosi *et al*. (2013), who found similar situation in Gaborone, Botswana. The results agree with a Pakistan study by Amir *et al. (*2017), where personal protective equipment usually referred to as PPE is worn to minimise exposure to a variety of hazards. Personal protective equipment can contain such items as gloves, foot and eye protection, hearing devices (earplugs, muffs), hard hats, respirators and fullbody suits. The provision and use personal protective equipment is very low possibly due to the lack of awareness and regulations and enforcement by the employers and government.

4.2.6 Provision of welfare facilities at workplaces

The welfare facilities considered in the study were the availability of toilet, drinking water, resting place, First Aid, waste disposal, changing room, drainage of the premises and fire prevention (Table 4.10).

Table 4. 10: Workplace welfare facilities

Facility	Absent n (%)	Available n (%)	Not applicable n (%)
Drinking water	60 (15.5%)	75 (19.3%)	253 (65.2%)
Toilet/Latrine	172 (44.3%)	142 (36.6%)	74 (19.1%)
Resting place	285 (73.5%)	36 (9.3%)	67 (17.3%)
First Aid Equipment	355 (91.5%)	22 (5.7%)	11 (2.8%)
Fire prevention/Equipment	342 (88.1%)	38 (9.8%)	08 (2.1%)
Waste disposal(domestic)	253 (65.2%)	71 (18.3%)	64 (16.5%)
Changing room	277 (71.4%)	52 (13.4%)	59 (15.2%)
Drainage of workplace	318 (82%)	32 (8.2%)	38 (9.8%)

Provision of the welfare facilities in the informal non-food manufacturing sector were lacking. Most respondents revealed that there was lack of drinking water in their businesses as shown by 253 (65.2%). The provision of water 60 (15.5%) was however provided the workers themselves not the enterprises while the toilet/latrine facility was only 74 (19.1%) of the sampled premises. First aid equipment was almost absent in the informal non-food

manufacturing sector only 08 (2.1%). The informal sector lacks most of the necessary welfare facilities for workers, this results to psychological hazards of stress and discomfort. These findings concur with Burton (2010), who states that the Informal sector workers operate in inhumane conditions and makeshift places without sanitary facilities, examples of such environments include; road reserves, informal market places, wetlands / marginal lands and poorly serviced homes, all of which can expose workers to environmental hazards and diseases, traffic accidents, fire hazards, crime, assault and as well as weather related discomfort and muscular- skeletal injuries. Despite the risks involved, due to its unconventional nature and location, informal workers in most African countries are not protected by the institutions that are mandated to protect them. Conventional occupational safety and health institutions have been designed to protect formal workers in the formal sector environments (Alfers *et al.*, 2012).

Lund *et al*. (2016) states that informal workers operate in atypical and non-standard workplaces that are excluded by definition, from occupational safety and health protections measures. The findings further concur with Mogane *et al*. (2013) who found out that most of the informal sector establishments are located in makeshift structures, open spaces, road reserves, wetlands/ marginal lands and poorly planned premises which do not have toilets, running water, means of solid waste disposal and blocked drainage systems. These provide breeding places for vectors and produce intolerable stench to workers. The same study found out that the informal sector lacks welfare facilities and services in the workplace. Sanitation facilities are non-existent at roadside and open air enterprises. Workers near rivers face additional problems of mosquito bites, malaria fever and poorly lit and ventilated workplaces. There is lack of safe drinking water and washing facilities. The same clothes are used both at home and the workplace.

Similarly, Theuri (2012) contends that the conditions under which most informal workers operate are precarious and unsafe. Many operate in ram-shackled structures, lack sanitary facilities or portable water and poor waste disposal. This was in sharp contrast to a study carried out in Thailand that targeted 369 enterprises with 20-299 employees dealing in high value export commodities that found average work duration to be 8 hours per day (92.1%) and 47.2 hours per week, 98.5% had access to clean drinking water; 72.5% had good hygienic places for eating; sanitation was good with clean sanitary conveniences in 98.2% of the enterprises; 73.9% had resting places in the enterprise; and 77.9 % were provided with

work clothing (Kongtip *et al.*, 2007). The Occupational Safety and Health Council (2011) recommends that a clean and tidy workplace is essential to ensure health and safety of workers. Regular cleaning of work places, equipment and devices should be carried out to ensure an adequate level of workplace hygiene. It further states that sufficient sanitary facilities should be provided for use by workers in the workplace. This is supplemented by the Health and Safety Executive (2007) that affirms that provision of suitable and sufficient sanitary conveniences and washing facilities should be made readily accessible, kept clean, adequately ventilated and lit.

Welfare facilities are a result of engineering controls provided to work places during construction. The informal non-food manufacturing sector has inadequate welfare facilities at the work places. The workers incur personal costs to get welfare services like toilet / latrine, getting drinking water, First Aid services while for those which cannot be accessed through payments, the employees cope up with the situation but results in psychological hazards of stress, fatigue, burnout, job dissatisfaction and poor personal and environmental hygiene, a precursor to many occupational injuries and illnesses.

4.3 Knowledge on occupational safety and health practices in the study area

Knowledge was graded as a percentage (0-40) $\leq$ 4 marks being low level, 40- 70 % (4-7) marks as moderate and 70-100% (7-10 marks) high level and was assessed using broad awareness questions on a scale of 1-10 marks. High level of knowledge (adequate) was assumed when the respondent gave above 7 marks / right answers while moderate was assumed when the respondent gave between 4 and 7 right answers and low level of knowledge (inadequate) was assumed when the respondent gave less than 4 answers right.

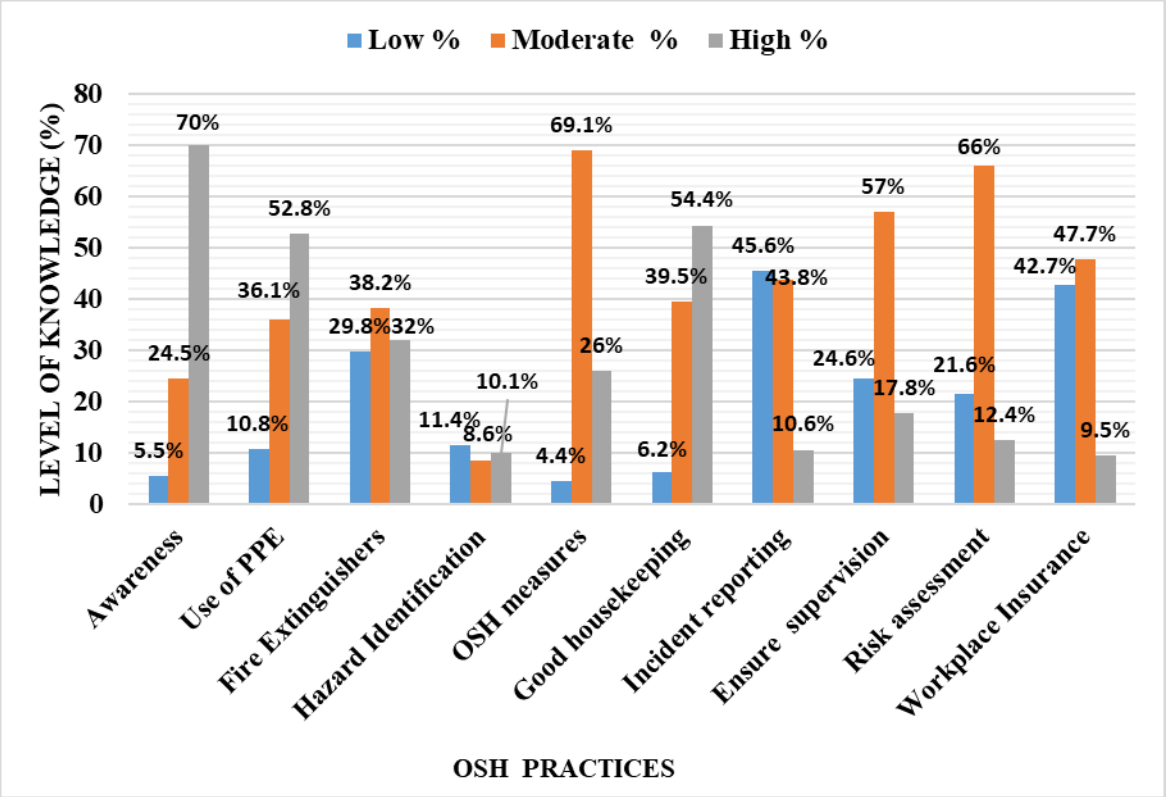


Figure 4. 2: Respondents' knowledge on hazards and control measures

For knowledge of occupational safety and health hazards, the respondents were asked whether there are any occupational safety and health practices were being used to control hazards at the workplace. Data from the respondents (Figure 4.2) revealed that the level of knowledge of occupational safety and health practices was very low on most of the control measures (below 40%) and moderate with only good housekeeping and PPE 211 (54.4%) and 204 (52.8 %) respectively. Training and awareness was moderate 271 (70%). Training and awareness is however not being done in the informal sector due to lack of information and knowledge on occupational safety and health. The low and moderate levels of knowledge on control measures gives a clear indication that most workers in the informal non-food manufacturing sector do not have adequate knowledge towards occupational safety and health hence cannot be able to control occupational hazards at work.

The results are contrary to a study on an Oil Rig in Pakistan (Amir *et al*., 2017), which revealed good knowledge among the participants (62.6%) and poor knowledge (37.6%) of occupational safety and health hazards. Similarly a study in Nigeria (Adebola, 2014) found very high level of knowledge of occupational safety and control measures amongst oil workers. This was likely due to the strict regulation and enforcement in the oil

industry as compared to the unregulated informal sector. In Nigeria, evidence had shown that most of the respondents had knowledge regarding hazards and the knowledge is gained from school professional training, on job experience and post-employment profession in service workshops (Onajole *et al*., 2004). Recent and more systematic knowledge, attitudes and practices (KAP) studies reviewed have shown a consistent divergence between employers' and workers' knowledge of occupational safety and health hazards in small scale enterprises and the informal sector (Eakin *et al.,* 2017). Similarly, Rongo (2005) assessed the awareness of ergonomic principles in small industries in Dar es Salaam and found very low level of awareness of major areas of ergonomic hazards, even though the owners had received vocational training. The study also found out that in cases where machines were available, workers and even the owners were either not aware that machine tables were height adjustable or did not know how to use them. The consequences were that workers suffered from injuries, neural problems, dermatological, respiratory and musculoskeletal disorders such as low back pain and neck pain. Another study in South Africa (Niftrik *et al*., 2003), revealed that workers engaged in garment manufacturing sectors had high knowledge of safety and health problems related to their occupation, good knowledge of the importance of using PPE and their benefits but few workers demonstrated compliance to such measures.

However, Champoux and Brun (2003), found out that although managers felt they knew more about hazards and risks in the workplace, safety audits revealed extremely hazardous workplaces. It was noted that occupational safety and health practice is not a priority for these firms and knowledge may not always translate into effective practice of occupational safety and health, other factors such as infrequency of accidents, and lack of economic incentives to invest in safety and health may explain. Similarly a study in a small scale industry in Sheffield, UK (Bradshaw *et al.,* 2001), found out that workers were provided with PPE but these were not used, thus raising the problem of education in the workplace. Small businesses do not consider safety and health a priority. This suggests that safety practice does not only depend on knowledge and attitudes but is positively associated with being informed about safety precautions and being supplied with safety gear coupled with adequate and proper supervision.

The informal non-food manufacturing sector in Kampala City has very low level of knowledge and risk exposure within the employers and employees about the hazards inherent in their workplaces. Knowledge has a significance relationship on attitude which may translate in good occupational safety and health practice in the informal sector. The poor

knowledge on occupational health and safety at work results from lack of awareness and knowledge from the employers and the regulatory agency about the dangers of occupational health and safety at work.

The results above are supported by the walk through survey, it was clear that there was poor housekeeping of the work places most of the raw materials were poorly stored on the floor, the passages where they existed were blocked by empty boxes, working areas were not properly defined and most of the businesses did not have perimeter fences and as such tenants and children from various households were using paths crossing in between the working areas. Welding was being done in the open and along the roadsides and although the welders were using pseudo eye goggles. The rest of the people in the workplaces were being affected by the welding flame, fumes and other related activities.

Poor housekeeping was similarly observed, enterprises had poor housekeeping at the workplaces, tools used in different trades were not properly stored and passages were in most cases cluttered and obstructed by cables, old wires and raw materials. On equipment it was observed that in most cases the machines and equipment used in the businesses were old using old technology and most of them unguarded. The danger of moving and flying parts was always eminent and during operation there was high levels of noise emanating from them yet no relevant noise personal protective equipment(noise masks) were being employed. On the provision and appropriate use of PPE, it was observed that the personal protective equipment available was of inferior quality and the wrong type worn. The commonest PPE used was the overalls and aprons. Safety shoes were least available and most of the workers used flat open shoes and sleepers or worn out sports shoes. This observations concur with study in Gaborone City, Botswana who found out poor housing, no demarcations or fences on premises, no guards on the machines and equipment used and inadequate and inferior personal protective equipment where it existed (Buhlebenkosi *et al.*, 2013).

According to Makin *et al*. (2010) there are 3 main approaches that have emerged to manage hazards at workplaces and these include; safe place, safe person and safe systems. Safe person strategies involve techniques that focus on equipping the person with knowledge and skills to avoid creating dangerous scenarios in the first instance or with the ability to deal with unsafe situations should they arise; communicating awareness of situations that have the potential to cause harm or with the recovery of the person after an illness or injury experience

whether it being physical or psychological. Due to the complexity of issues associated with the human factor a wide range of treatment options can be listed like; pre- employment screening, training needs analysis for competency awareness and refresher training, continuing education, networking, awareness of fatigue, employee assistance programs, health promotion and vaccination, use of personal protective equipment, application of behavioural based safety. However the approach may not ably fit in the informal sector due to lack of resources and regulation. In an interview with Kampala Capital City Authority's Occupational Safety and Health Manager (John Paul Sajjabbi personal communication 30th July, 2018), he stated that the informal sector is not under the Kampala Capital City Authority's jurisdiction and no service is given to them. This was also reiterated by Lund *et al.* (2016) who cites that at the level of Municipal government, there are no administrative bodies to deal with occupational safety and health and although there are environmental health services, they don't have an explicit worker focus. This is supported by Burton, (2006) who states that the informal sector has a non-regulated labour market which usually involves workers without written arrangements with the employer undocumented by government.

4.3.1 Attitudes of workers towards occupational safety and health and safety practices

Attitudes on occupational safety and health at work was assessed using 15 questions on a Likert scale, answers were strongly agree, agree, no response, disagree and strongly disagree. These were summarised into "Agree" and "Disagree". Overall "Agree" would indicate good attitude with 50 and above percent while "Disagree"' below 50% would denote poor attitude of occupational safety and health control measures (Table 4.11).

Table 4. 11: Attitudes of respondents towards occupational safety and health practices at work.

Attitudes of OSH management practices	Response n =388	
	Agree n (%)	Disagree n (%)
Ensure that all employees are trained before work	135 (34.8%)	253(65.2%)
Ensure that personal protective equipment provided	240 (62.9%)	148(37.1%)
Ensure good house keeping	237 (61.1%)	150(38.7%)
Provision of welfare facilities	60 (15.5%)	328(84.5%)
Ensure that there are written policies at work place	26 (6.7%)	326(93.3%)
Ensure that operating procedures/ manuals are used	17 (4.4%)	371(95.6%)
Ensure that signage is pinned on walls	18 (4.6%)	368(94.8%)
Ensure that safety procedures/ Security systems are used	15 (3.9%)	373(96.1%)
Ensure that Fire extinguishers are available and checked	10 (2.6%)	378(97.4%)
Ensure that there is a perimeter fence at the workplace	11 (2.8%)	377(97.2%)
Ensure that incidents and unsafe procedures	12 (3.1%)	376(96.9%)
Ensure that First Aid box is used	14 (3.6%)	374(96.4%)
Ensure that sanitary facilities are available at work place	18 (4.6%)	370(95.4%)
Ensure that risks are identified and mitigated	16 (4.1%)	372(95.9%)
Ensure that annual audits are done	11 (2.8%)	377(97.2%)

Attitude of respondents was generally poor with a range of (2.8-15.5%) for most of the practices save for the use of PPE and good housekeeping 240 (62.9%) and 237 (61.1%), respectively. Overall, attitude was demonstrated by 53.5% of the respondents in the informal non-food manufacturing sector. This reflects careless attitude towards work particularly in the developing countries worsened by lack of regulation, leading high accidents and injuries with morbidity, mortality, financial, social and economic externalities in the country's economy. These results concur with those in a study on knowledge and attitudes in Vietnam where 403 craftsmen were interviewed, results showed good knowledge levels and poor attitude scores as low as 3.72% and 4.22% respectively (Truong, 2009).

4.3.2 Attitude on provision and use of PPE

Information on the use of PPE was enlisted in the study about the various personal protective equipment used in the workplace. The PPE in question were gloves, masks,

aprons, goggles, plugs, hard hat and safety shoes Results on the attitude of workers in the use of PPE are presented below (Table 4.12).

Table 4. 12: Attitude on the use of PPE in the study area

Attitude of provision and use of PPE	%(n) Agreed(n=388)
Wearing gloves can reduce damage to your hands	181 (46.7%)
Wearing masks can reduce damage to respiratory organs	267(68.8%)
Wearing safety boot can reduce damage to your feet	221 (57%)
Wearing apron can reduce damage to your body	324 (83.5%)
Wearing goggles can reduce damage to your eyes	214 (55.2%)
Washing hands can reduce risks from chemicals	129 (33.2%)
Bathing after work can reduce damage to health risks	114 (29.4%)
Wearing ear plugs can reduce damage to your ears	321 (82.8%)
Wearing hard hat can reduce head injury	324 (57.7%)

Most of the respondents agreed highly with aprons and ear plugs as variables regarding attitude on provision and use of PPE 324 (83.5%) and 321 (82.8%) respectively. This is probably so because of the cheapness in acquiring the aprons, masks and ear plugs hence affordable in the informal sector. However the high attitude may not necessarily result into practice unless enforced. These results are in agreement with a study in West Africa (Basu *et al.,* 2016) which found out that the informal sector worldwide is notorious for having unsafe working conditions, poor health standards, and pervasive environmental and occupational hazards.

There is a positive attitude on the use of PPE which does not match with its provision, and yet this is the most important intervention in the informal sector, however the PPE is self-provided and in most cases inadequate and inappropriate for the work. This makes it less effective in protection since it just cosmetic. Personal protective equipment is the last option of protection to the worker in the hierarchy of prevention hence it cannot work alone when other controls that include elimination of hazards, engineering controls, administrative controls are not in place. However, the high attitude may not translate to good practices and occupational safety and health culture unless supported by enforcement.

Knowledge, attitudes and practices of occupational safety and health was moderate on most of the control measures for occupational safety and health in the informal non- food

manufacturing sector commensurate with education. Workers were mainly knowledgeable on PPE and good housekeeping at work. These are the most practices control measures at workplaces because they are cheap and easy to implement in the informal sector. Knowledge on other control measures was very low because of lack of information, knowledge and lack of regulation by government.

4.4 Factors affecting practices of occupational safety and health in the study area

To identify occupational safety and health practice predictors, a Chi-square analysis (Table 4.13, details in appendix x) was done on the variables. The factors under consideration were; age, gender, level of education, occupational safety and health training and awareness, duration at work, provision and use PPE, risk identification and control, awareness of workers, induction of workers, supervision of workers, audits, inspection, First Aid / medical service, type of work and period worked in the informal sector. The significant variables were subjected to a multivariate logistic regression analysis (Table 4.14). The results showed that the variables; age, education level, gender, level of knowledge, duration of work, work experience, type of employment and use of PPE are the main factors influencing occupational safety and health practices at work.

Table 4.13: Chi-square analysis of variables affecting practices of occupational safety and health in the study area

Variable	Chi Square	P Value
Gender	23.9	0.003
Age of respondents	51.3	0.000
Marital status	17.1	0.002
Education level	147.3	0.000
Period working in Juakali	87.5	0.002
Number of employees at work	69.9	0.000
Hours spent at work	19.8	0.004

All the above variables were statistically significant at ($p< 0.005$) at 95% level of significance. The practices of occupational safety and health were good among male respondents 257 (66.3%) as compared to the female ($p<0.05$. $\chi^2 = 23.9$). The practices of occupational safety and health still was very good among respondents with higher level of education ($p< 0.05$, $\chi^2 = 147.3$). There is a statistical significant relationship between educational status and practices of occupational safety and health ($p=0.00$) at 95% level of significance $p<0.05$. $\chi^2 = 147.3$). Occupational safety and health practices are poor among respondents with no education 41 (10.5%) and relatively low (18.5%) in respondents with primary education. There is a statistical significant relationship between educational status and practice at 95% level of significance, $p<0.05$.

Further, period spent working in informal sector (*Jua-kali*) exposed workers to practices of occupational safety and health and it revealed that people who had worked for 10 years and above had good knowledge of occupational safety and health 176 (45.6%). There is a statistical significant relationship between working period and practise of OSH ($p<0.05$) at 95% level of significance ($p<0.05$. $\chi^2 = 87.5$). Regarding number of employees at work and practices of occupational safety and health, it was found that a high number of employees perhaps 4-5 people in organisation had good practices of occupational safety and health than in other groups. This is due to worker to worker relationship and the seniors being able to

advice the new and young workers. There is statistical significant relationship between number of employees at work and on practices of occupational safety and health at 95% level of significant ($p<0.05$, $\chi^2 = 69.9$) The results also reveal that a significant relationship existed between hours spend at work and practices of occupational safety and health, those who spent less hours at work (less than 8 hours) were poor at practices occupational safety and health than those who spent more hours at work ($p<0.05$. $\chi^2 = 19.8$). However, more hours at work are most likely to bring about fatigue, stress, exhaustion, burnout leading to psychosocial hazards. Psychological hazards can be a precursor for physical and mechanical hazards in the workplace.

Table 4. 14: Multivariate logistic regression analysis of factors affecting occupational safety and health practices at work

Characteristics	OSH practices			COR (with 95%CI)	AOR (with 95%CI)	
	Safe n=388	Unsafe n=388	*p*			*p*
Age (years)			0.511			0.210
Less than 30	51(11.2%)	12(3.80%)		0.0304* (0.326)	0.0341* (0.331)	
31-40	176(55.9%)	37(9.50%)		0.0467* (0.167)	0.0478* (0.169)	
41-50	144(22.5%)	85(21.9%)		1.019 (0.210)	1.022 (0.211)	
>50	74(16.7%)	61(15.7%)		1.000	1.000	
Gender			0.233			0.331
Male	252(66.3%)	171(40.1%)		0.0918 (0.127)	0.0997 (0.130)	
Female	131(33.7%)	117(30.2%)		1.000	1.000	
Education status			0.147			0.274
Illiterate	41(10.5%)	19(4.80%)		0.0462* (0.171)	0.0485 (0.176)	
Primary	72(18.5%)	17(4.70%)		0.0518 (0.144)	0.0529 (0.153)	
Secondary	93(24.5%)	54(13.9%)		1.000	1.000	
Higher	188(44.5%)	128(32.9%)		0.0859 (0.339)	0.0819 (0.341)	
Knowledge			0.872			0.622
Adequate	69(17.9%)	74(19.1%)		1.000	1.000	
Inadequate	95(24.5%)	111(28.6%)		0.0860 (0.151)	0.0863 (0.153)	
Duration at work			0.194			0.171
1-8 hours	61(15.7%)	90(23.2%)		1.189 (0.194)	1.106 (0.195)	
9 and above	327(94.3%)	298(76.8%)		1.000	1.000	
Type of employment			0.313			0.159
Metallic products	81(20.9%)	122(31.4%)		1.140 (0.166)	1.142 (0.168)	
Textiles and clothing	77(19.8%)	95(24.5%)		1.197 (0.184)	1.199* (0.186)	
Manufacture of furniture	148(38.1%)	274(70.6%)		0.0274* (0.176)	0.0276* (0.178)	
Concrete and brick products	103(26.5%)	188(48.5%)		1.0109 (0.102)	1.110 (0.103)	
Repair of equipment and machinery	155(39.9%)	179(46.1%)		0.0566 (0.268)	0.0568* (0.270)	
Paper making and recycling	298(76.8%)	198(50.0%)		1.000	1.000	
No. employees at work			0.442			0.551
0 Employees	197(50.7%)	111(28.6%)		1.000	1.000	
1-3 Employees	61(15.7%)	55(14.2%)		0.343(0.181)	0.911(0.183)	
4 or 5 employees	43(11.1%)	21(5.4%)		1.171(0.312)	1.444(0.314)	
Use of PPE	88(22.7%)	117(30.2%)	0.533	0.0317* (0.0318)	0.0319* (0.0322)	0.693
–2 log-likelihood				*198.994*	*342.447*	

** Statistical significance i.e. p <0.05*

COR= Crude Odds Ratio, AOR=Adjusted Odds Ratio

Using the quantitative variables, the multivariate logistic regression estimates predicting factors affecting occupational safety and health practices in the informal non-manufacturing sector was performed. The multivariate regression logistic results shows that respondents who were 31-40 years old had significantly reduced odds (COR 0.0467-0.0478) of practicing occupational safety and health practices at work, compared with the odds for those who were below 30 and above 50 years. Respondents who had 252 (65%) lower odds of using occupational safety and health practices were unsafe than those who were using occupational safety and health practices. The study found out somewhat significant differences in the gender of respondents using occupational safety and health practices and those not. It was revealed that men in general practiced/ employed safe practices of occupational safety and health than women (COR 0.0918-0.0997). Men were therefore more likely to be safer than women in the informal sector. This could be explained in terms of men having higher literacy levels than women in Uganda.

In terms of education those with secondary and higher levels of education were more likely than those without education to practice occupational safety and health. Also respondents with inadequate knowledge and awareness of occupational safety and health had lower odds of occupational safety and health practices than those with adequate knowledge and awareness (COR 0.0860-0.0863). In addition, the duration of work shows that people who worked less than 8 hours had increased odds (COR 1.189-1.106) of using occupational safety and health practices and therefore somewhat safe while respondents who revealed working more hours (above 9 hours) had reduced odds and were susceptible to more injuries particularly of the psychological nature which jeopardized their safety. Overall, level of knowledge mainly due to education and duration at work were the most important variables influencing occupational safety and health practices of informal sector workers.

The type of employment has influence about the amount of risk exposed to the workers. The most dangerous informal sector was manufacture of furniture (COR 0.0274 - 0.0276), this due to the reliance on chemicals and mechanical equipment being employed during the manufacture of various parts for furniture. People who worked in the furniture manufacturing sector were more exposed to serious hazards like heavy lifting, chemical fumes, sharp edges, and working while standing in the open and poor sanitation. Use of PPE (COR of 0.0317-

0.0319) is the most common practice being applied in the informal sector mainly because it is easy and cheap to acquire yet PPE alone cannot guarantee safety, it must be supplements by other measures since it is the last resort in the occupational safety and health management of hazards. However the quality and appropriateness were not to the expected standards. Consequently the low level of safe occupational health practices shown by use of personal protective equipment of the respondents in the study could be explained by the general low levels of knowledge among the respondents.

The results were to a similar study in Oye State, Nigeria (Ogunnowo *et al*., 2010) that reported that knowledge, attitudes and practices were found to be good in employees who are recently employed. The results collaborate with Amir *et al*. (2017), on an Oil Rig in Pakistan which revealed that among the participants, 62.6% demonstrated good knowledge and practices 37.6% showed poor knowledge. Good attitude towards occupational safety and health was demonstrated by 53.5% while 46.5% demonstrated poor attitude. Evidence had shown in Nigeria that most of the respondents have knowledge regarding hazards and practice is gained from school professional training, on job experience and post-employment profession in service workshops (Onajole *et al*., 2010). Recent and more systematic knowledge, attitudes and practices (KAP) studies reviewed have shown a consistent divergence between employers' and workers' knowledge of occupational safety and health hazards in small scale enterprises and informal sector (Eakin *et al.,* 2017). Similarly, Rongo (2005) assessed the awareness of ergonomic principles in small industries in Dar es Salaam, Tanzania and found a very low level of awareness of major areas of ergonomic hazards, even though the owners had received vocational training. The study also found out that in cases where these were available, workers and even the owners were either not aware that machine tables were height adjustable or did not know how to use them. The consequences were that workers suffered from injuries, neural problems, dermatological, respiratory and musculoskeletal disorders such as low back pain and neck pain.

According to Burgard and Lin (2013), differences in how individuals are socialised and treated based on gender can lead to health disparities like wage gaps and sexual harassment. Gender determines access to health work in many ways, which sometimes differ from or modify the influences of other social identities. Consistently, Ercan and Kiziltan (2014) state that men experience work accidents more frequently than women and their injuries are more severe. Male workers younger than 25 years are also more prone to work accidents than the

rest of the workforce. Similarly, Wooten (1997) concurs that women are also differentially sorted into jobs within the occupation structure leading to differential exposures at work and varying total hazard exposure. Jacobs and Gersom (2005) on the other hand pointed out that women are disadvantaged at work in many ways than men, occupying fewer highest level positions in organizations and the occupation structure. Leeth and Russer (2000) agree that women are also less likely to hold many of the physically dangerous jobs and spent less total time at work and concludes that, this may be an advantage to women.

Extreme neglect of illiteracy also results into illiterate and poorly educated manual workers, including female workers and the same notion is supported by Siziya *et al*. (2013) who state that people with high education attainment are more likely to understand harmful exposures and avoid them. Similarly, in a Nigerian study conducted among welders (Sabitu *et al*., 2009), only 20% of those who had no formal education were aware of occupational hazards and safety measures compared to 78% among those who had primary education and 85% who had secondary education. Those with higher educational attainment may also be employed in more skilled but less hazardous jobs. Highly educated people are more likely to be in managerial, supervisory, clerical and administrative work than in manual or factory work.

Further, in Thailand, Kongtip *et al.* (2015) found out that informal workers have less formal education than the formal ones. Majority (64%) had only primary education, 28.7% had secondary education and only 7.1% had technical training or University degree. Absence of schooling and female education result in enhanced female mortality. The related health impacts of illiterate workers are less awareness of health hazards in working conditions that lead to injuries and occupational diseases as a result of poor apprehension of control measures. Employers are obliged to provide training and awareness to staff in form of induction and on job training as well as refresher training to help reduce the injuries and accidents in the workplace.

Research conducted in America by the Atlantic Collaborative for injury Prevention (Raphael, 2010), found high rates of adolescents and practitioners struggling to understand how to effectively prevent injuries in young people. The Author, states that in the case of adolescents, social and economic determinants interact with a biological propensity for higher risk taking behaviours. Therefore, while risk taking has benefits and is part of the adolescent development, inappropriate or excessive risk taking brings with it increased risk

of harm. Although not applicable to all adolescents, evidence has shown that pubertal neurological changes that impact risk perception, reward seeking and social image can increase risk to injury and endanger occupational safety and health. Similarly, Zewdie *et al*. (2011) revealed that, working at young age increases risk of sustaining more occupational injury among factory workers compared with older workers in Ethiopia. This is mainly attributed to inaccessibility of occupational safety and health information, lack of occupational safety and health training, lack of experience and low level of knowledge and skills among young workers.

In this study the variables age, sex or gender, education level and work experience were found to be the most important factors affecting implementation of occupational safety and health practices at work in the informal sector. The higher the age the better for workers to avoid occupational hazards. The higher the educational level also meant that people can be knowledgeable about the dangers to health and safety and can easily avoid them, while the gender of a person effects the way how risk is perceived with men being more risk averse than women while the longer one works in the sector gets more awareness of the hazards prevalent in the industry and can easily avoid them. The informal sector situation therefore is susceptible to accidents and injuries mainly affecting the young population with no vocational skills. There is need to regulate the sector, provide training and information to workers at workplaces.

4.5. Workplace legal and policy gaps of occupational safety and health in the study area

Legal framework refers to the specific regulations, government laws and policies regulating occupational safety and health practices in all workplaces. These were occupation safety and health regulations, workplace occupational safety and health policies and statutory inspection of machines. The respondents were asked whether they were aware of the occupational safety and health regulations whether they possessed a workplace policy and whether the machines were regularly inspected.

In the informal non-food manufacturing sector, it was revealed that all workplaces were not aware of the occupational safety and health regulations and almost all the workplaces lacked workplace occupational safety and health policy save for the textiles and clothing 03 (0.8%). and all of them did not have certificates of machine inspection. The 0.8% workplace policy was due to the training from the community development department during the Commonwealth Heads of Government Meeting in Uganda in November 2007.

The lack of awareness on the OSH regulations is due to lack of regulation by government and the absence of workplace occupational safety and health policies and certificates of inspections is due to the lack of information. Lack of knowledge is a big problem resulting from lack of regulations in the Ministry of Gender Labour and Social Development. Information collected from the responsible Ministry of Gender, Labour and Social Development indicate that the agency does not have a national health and safety policy. The situation of lack of policies stems from the Occupational Safety and Health Act (OSHA, 2006) which only empowers parliament to make regulations. It also stipulates that companies with less than 25 people are to make oral policies. This makes the informal non-food manufacturing sector to be unregulated and supervised due to poor regulation.

In a similar study in Canada (Champoux and Brun, 2003), found out that majority (69.9%) of the metal enterprises with 1-5 employees did not have a written health and safety policy. This is in contrast with Kenyan Occupational Safety and Health Act (OSHA, 2007) which empowers the minister concerned to develop a national occupational safety and health policy every five years. On regular inspection of machinery none was inspected, this has been attributed to inadequate staffing and resources coupled with the lack of decentralisation of occupational safety and health activities the Ministry of Gender, Labour and Social Development. This was clearly stated by the Auditor General's report (GoU, 2016a) who stated that among the challenges for occupational safety and health in Uganda is the inadequate staff at the Ministry concerned. Respondents similarly were ignorant on the statements of workplace having occupational safety and health policies due to lack of information.

Lack of awareness about OSH regulations, lack of workplace policies and lack of certificates for machine inspections in the informal non-food manufacturing sector stems from lack of the government regulation in the informal sector. This state of affairs concur with Buhlebenkosi *et al.* (2013) in Gaborone Botswana, who found out that in all the urban informal sectors, the workers acknowledged that they were aware of the health and safety hazards at their workplaces as well as the environmental concerns but confessed no knowledge on the specific Acts and regulations governing their trades save for the taxation laws.

Results above also concur with Ndegwa *et al. (*2014) who assert that apart from social determinants of occupational safety and health, legal framework also play a very big role in

influencing occupational safety and health in the informal sector. Key among these are: Occupational safety and health policy, Occupational Safety and Health Law, Labour inspections, occupational safety and health audits, social protection and occupational safety and health/ labour training. The effectiveness of a legal system defines the occupational safety and health outcomes of any nation. Government laws and regulations have a very strong influence on the extent to which firms implement occupational safety and health programmes. Sometimes employers are not willing to provide comprehensive occupational safety and health programmes and government enforcement is necessary to exert pressure on them. In countries where governments have firm laws and regulations, implementation of occupational safety and health has been successful.

Cliff (2012) also concurs that occupational safety and health regulation, characterised as being uniformly prescriptive with emphasis on detailed and highly technical specifications, standards and compliance to rules should be enforced by government funded independent inspectorates with broad powers. However according to Mendeloff (1988), administrative regulation does not necessarily increase workplace safety because the cause of accidents is a complex interaction of labour, equipment and work environment.

Hughes *et al*. (2011) further agree that occupational safety and health legislation places a duty of care on employers and employees to achieve adequate occupational safety and health implementation through safe workplaces, safe systems of work and provision of personal protective equipment. ILO (1981b) under the ILO Convention No. 155 (1981a) stipulates that workers are supposed to take reasonably practicable measures to protect themselves and others at work from risks arising from their actions and omissions at the workplace, cooperate with the employer in achieving high standards of safety and health at work and under obligation to use the personal protective clothing and equipment. However, Ogunrinola *et al*. (2012) argue that the situation in the informal sector in developing countries' economy is different. The enterprises that operate in this sector do so without binding regulations including those that operate officially with regulations that do not compel rendition of official returns on its operations or production processes, and most laws relating to occupational safety and health are rarely complied with in the sector.

The ILO Conventions require states signatory to them to have consultations with the most representative organisations of employers and workers to formulate, implement and periodically review coherent national policies on occupational safety and health and the

working environment. Article 7 of the Convention No.155 (1981a), adds that the review shall be done with a view of identifying major problems, evolving effective methods for dealing with priorities for action. The policy requirement is thus a dynamic cyclic process requiring a periodical review to ensure that scientific and technological progress and changes in the working environments can be incorporated into the national policy. Calling for a national occupational safety and health policy emphasises that governments as main players must consider occupational safety and health as a matter of national concern and priority and can be actively involved (ILO, 1981a). These conventions are binding to all countries which ratify them and can benchmark good practices in occupational safety and health. However, many developing countries have not developed national occupational safety and health policies to contain the situation.

This is further reinforced by ILO (2006) which requires each ratifying member country to formulate, implement and periodically review a coherent national policy and to take necessary measures to maintain an adequate system of inspections and make sure that different regulations especially those related to workplace safety are complied with. Appropriate legislation and regulation together with adequate means of enforcement, are essential for the protection of workers' safety and health.

Although Uganda is a Member to ILO and signatory to the Rome Statute, it has not ratified the key convention for implementing Occupational safety and health. Unfortunately, despite having an Occupational Safety and Health Act (OSH Act 2006), the country does not have a national occupational safety and health policy (GoU, 2016a) in sharp contrast to the Kenyan occupational safety and health system which has put in place the National Occupational Safety and Health Policy, five year Occupational Safety and Health SH Plan of Action, Occupational Safety and Health Regulations, Competent Occupational Safety and Health Authority, Occupational Safety and Health fund and a number of Occupational Safety and Health training institutions among others (ILO, 2013b).

There is little or no awareness about the OSH Act 2006 and the existing regulations if any, standards, codes of practice in the informal non-food manufacturing sector in Kampala City. The sector operates without any occupational safety and health regulations, rules, standards, or codes o practices. There are no occupational safety and health policy statements in the informal sector nor at national level. Resulting to a very low occupational safety and health culture in the country.

There is glaring evidence of the absence of legal and policy instruments and lack of awareness on occupational safety and health legislation in the informal non-food manufacturing sector. Partly due to lack of regulation of the informal sector by the government agencies. Access to occupational safety and health regulations, development of workplace occupational safety and health polices and statutory inspection of machinery are important in the reduction of work accidents, injuries and illnesses which would eventually lead to safe workplaces in the informal sector.

4.6 Compliance of good occupational safety and health practices in the study area

Compliance with occupationally safety and health practices was measured on Likert scale. 1= Never, 2= Rarely, 3= Sometimes, 4= Often, and 5= Always. Answers 1-3 were summed up to indicate no or noncompliance while 4-5 indicated yes or compliance with occupational safety and health measures at work. The variables were; always use PPE, always comply with safety practices at work, always comply with hazard control measures, always ask for occupational safety and health information, comply with reporting of incidents and unsafe practices, and always comply with audit exercises

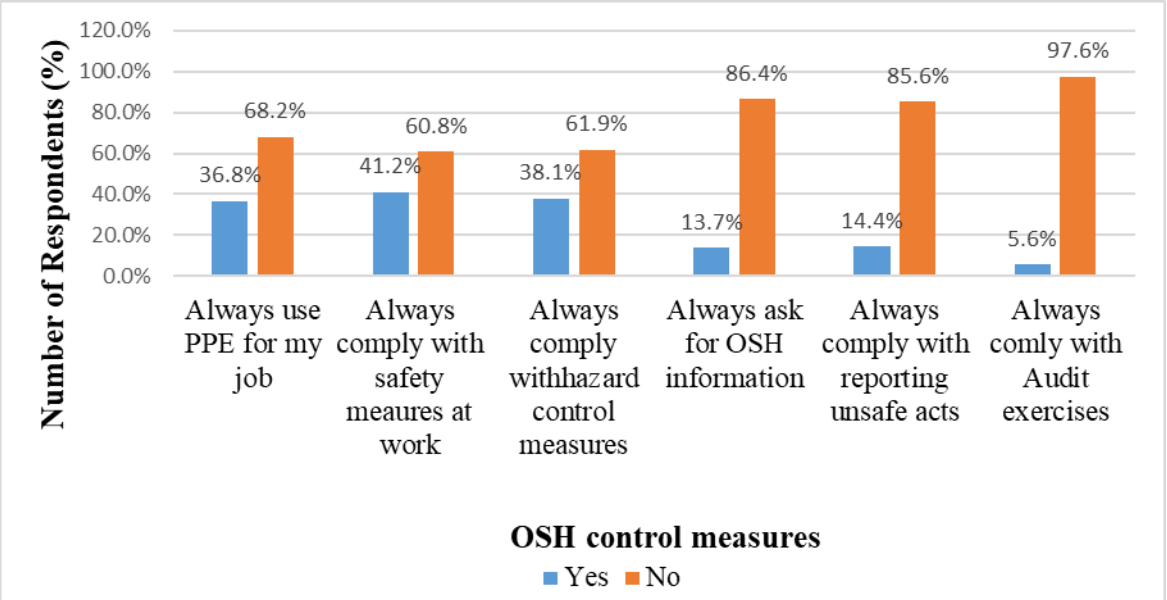


Figure 4. 3: Respondents' compliance with health and safety measures

Compliance with occupational safety and health measures was generally poor with below 50%. A high proportion of respondents 332 (85.6 %) did not comply with safe work practices, and only 56 (14.4%) complied with reporting of incidents and unsafe acts. This is

probably due to lack of knowledge, information and training. This makes the situation worse with proliferation of hazards in the informal sector hence affecting sustainable development of the country, leave alone meeting the SDGs. The least compliance measure was audit exercises, a rare activity to comply with due to the technicalities of hiring an external person to carry out the exercise which cost cannot be made by the small scale business. The results are in contrast to a study in Lagos, Nigeria (Adebola, 2014) which found high compliance among respondents (92.3%) reported high compliance with safe work practices while 79.6% complied with the use of personal protective equipment. The contrast is attributed to informal sector in Uganda being unregulated with no enforcement to encourage high compliance of occupational safety and health practices compared to the formal sector

A study in Oyo State Nigeria revealed that knowledge, attitude and compliance with preventive measures were good among those who were more recently employed in the industry. This was however contrary to findings in the same study which showed 93.7% of those who had spent more than 6 years having good compliance with occupational safety and health practices (Onajole, (2004). The findings of this study were however in contrast with another study in Nigeria where positive compliance of occupational safety and health measures were 85.9%. The high compliance was likely due to regulation and enforcement of occupational safety and health measures in the formal sector compared to the informal non-food manufacturing sector. The low compliance of occupational safety and health in the informal sector is due to lack of regulation and enforcement.

Compliance of safety and health measures is affected by the barriers to good standards of occupational safety and health which include complexity- a situation where employees usually become unhappy with the amount of information available on safety and health which may not be tailored to them and the red tape procedures to perform simple jobs. Regulation requirements can become overwhelmingly difficult to understand and poorly communicated. Competing demands to meet production targets or keep within the budgets may compromise safety and health of workers, while behavioural issues particularly changing workers' attitudes and behaviour to work safely is one of the biggest challenges in the safety and health at work. Therefore, to achieve high levels of safety and health requires a safety and health culture and enforcement. These can be through proper and competence recruitment, training, supervision, monitoring and evaluation of workers supplemented by a system of accountability and enforcement where institutional failures at the workplaces are addressed (Hughes *et al.*, 2011). This compares with a similar study in the United Arab

Emirates that revealed that despite the workers knowledge of occupational hazards, the use of personal protective equipment was very low (Adebola, 2014).

Parimalam *et al.* (2007) identified in the textiles and clothing manufacture, workers engaged in garment manufacturing sectors had high knowledge of health problems related to their occupation, had good knowledge on the importance and use of personal protective equipment and their benefits but very few workers complied to such measures.

According to Ndegwa *et al.* (2014), occupational safety and health legislation sets out specific standards on government policies regarding practices in work places and determines the extent of the punishment meted out against offenders. The author concludes that government laws and regulations have a strong influence on the extent to which firms implement occupational safety and health programmes. However in contrast to Naidoo, Kessy, Mlingi, Peterson, Mirembo (2009) urge that legalising health and safety standards in the informal workplace has little relevance because most workers in this sector are either self-employed or work within small bands with little additional resources to meet legislative demands. They suggest that policy frameworks should instead focus on raising awareness, providing technical expertise in hazard control, providing resources to control hazards and providing medical expertise for medical surveillance, diseases diagnosis and management.

Small businesses do not consider occupational safety and heath a priority. This means that safe practices do not depend on knowledge and attitude alone but positively related to availability of appropriate personal protective clothing and equipment, being constantly informed about safety precautions coupled with effective supervision for their use. The lack of supervision and auditing, non-seeking of information makes implementation to be latent and a time bomb since there is lack of enforcement both on the employer and the regulatory agency.

4.6.1 Obstacles to compliance with occupational safety and health in the study area

Compliance to occupational safety and health can be affected by a number of obstacles at work especially when the different stakeholders do not carry out their duties, responsibilities and obligations. A number of institutional obstacles currently limiting the ability to institute effective health and safety mechanisms at the workplace in in the study area were identified. Obstacles to occupational safety and health were assessed using 5 questions. On a scale of 1-5 (1= Not a problem, 2= Minor problem, 3= Moderate barrier, 4=

Serious barrier and 5= Very serious barrier) for the severity of the obstacles, the mode was 3 for all barriers listed. The questions were; cost investments for training and equipment, provision of information to workers, priority to productivity and profits, planning difficulties and government intervention (Figure 4.4).

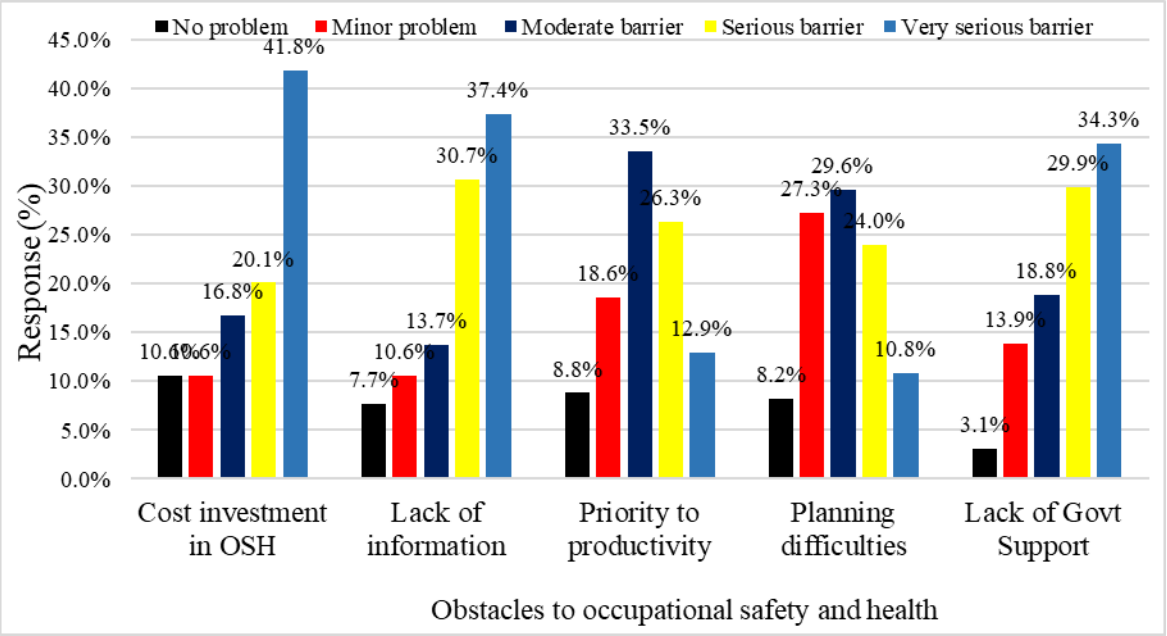


Figure 4. 4: Obstacles to occupational safety and health as reported by the study

The cost of investment was considered very serious barrier 162 (41.8%) and moderate by 78 (20.1%); lack of information of safety and health considered very serious barrier 145 (37.4%) as well as and lack of government support 133 (34.3%). This means that the main obstacles are cost of investment and lack of information and government support. These are internal and can be addressed by the informal sector players. Cost of occupational safety and health preventive measures for instance in terms of buying of PPE, Fire extinguishers, training, First aid, welfare facilities, decent work environments is high due to the fact that the informal sector does not have access to external funding in government and financial institutions because of lack of collateral; lack of information and lack of government intervention and guidance are the major obstacles to adequate occupational safety and health and implementation in the informal non-food manufacturing sector in the city and the country at large.

According to a survey carried out in small enterprises in Canada comprising of 103 manufacturing metal products and 120 in the garment sector, 37% of the employers

considered the cost to be an obstacle while 30% thought that lack of training, prioritising of production than safety and lack of time to be barriers to safety (Champoux and Brun., 2003). According to Ogunrinola *et al.* (2012) investing in the safety and health of workers will try to minimise its internal production costs as the provision of safety gadgets and decent work environment involves costs that must be paid by the firm with expectations of receiving benefits of such investments in form of higher productivity. The equilibrium level of safety is the point where the rising marginal cost of job safety intersects the downward sloping marginal benefits from job safety (McConnell *et al.,* 2010). However, evidence in most countries has shown that the level of safety attained is affected by the low level of investment in safe working environment by private firms and hence has motivated the public to intervene to reverse the trend. This is the actual situation in the informal non-food manufacturing sector which has low investments and cannot easily invest in occupational safety and health and requires the public intervention.

Cost of occupational safety and health preventive measures for instance in terms of buying of PPE, Fire extinguishers, training, First aid, welfare facilities, decent work environments is the most important obstacle affecting the implementation of OSH practices at work in Kampala high due to the fact that the informal sector does not have access to external funding in government and financial institutions. Lack of information and lack of government intervention and guidance are the major may affect the sector. Government needs to intervene by regulation of the sector, providing information and training to the informal sector.

4.6.2 Suggestions on possible solutions to improve occupational safety and health at workplaces in the study area

Using a scale of 1-5, (1= Not a priority, 2= Low priority, 3 = Medium priority, 4= High priority and 5= Essential), employers listed the possible solutions to improve the glaring occupational safety and health situation being marred by the obstacles aforementioned. The response on solutions to occupational safety and health included; training, provision of PPE, collaboration with government, upgrading of equipment and technology and vocation training (Figure 4.5).

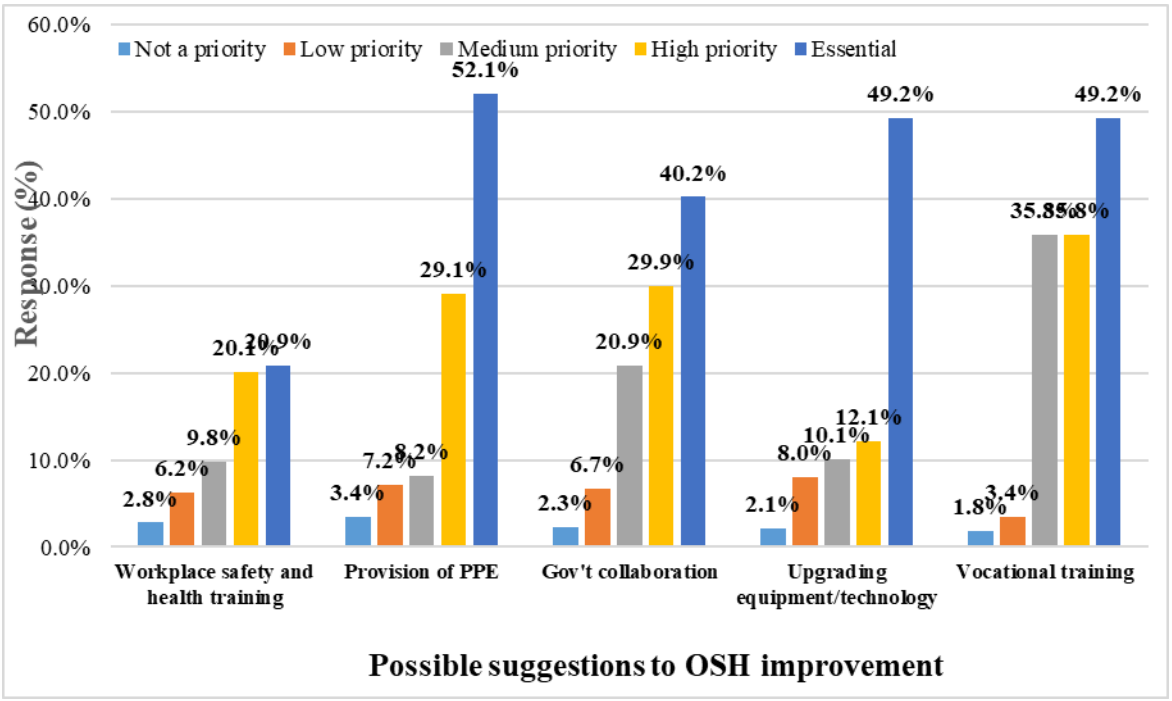


Figure 4. 5: Possible solutions for improvement of occupational safety and health at workplaces in the study area

Respondents revealed that provision and use of more PPE 202 (52.1%) was essential in the control of hazards of occupational safety and health at workplaces in the informal non-food manufacturing sector in Kampala City. They also agreed that upgrading equipment/technology and vocational training 191 (49.2%) and 191 (49.2%) respectively. The least possible suggestions were on Vocational training with 07 (1.8%). This is because government officers do not inspect or carry out any service to the informal sector. The essential measures listed are internal to the organization and can easily be achieved by creation of awareness in the informal sector. According to Alli (2009) management should demonstrate in words and actions, through policies, procedures and financial incentives, that it is committed to workers' safety and health, then supervisors and workers will respond by ensuring that work is performed safely throughout the enterprise. Total commitment on the part of management to making safety and health a priority is essential to successful occupational safety and health program. However, the situation is different in small enterprise where management is not clear, policies and procedures are non-existent and no regulation is done by government.

Similarly, Amir *et al*. (2017) urged that occupational safety and health administration requires that employers protect their workplace hazards depending on the dangers or work

place settings. It recommends the use of manufacturing or work practice control to handle or reduce hazards to the minimum level possible. Personal protective equipment is usually required to be worn to minimize exposure to a variety of hazards. Although this can be feasibly enforced in formal enterprises, it is a myth in the informal sector in developing countries.

A number of occupational safety and health management strategies were fronted during the study to improve the situation in the informal non-food manufacturing sector. These suggestions among other included workplace safety and health training, provision and use of personal protective equipment as well as vocational training of the workers in the informal sector. Other suggestions were upgrading the technology in the informal sector.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this chapter is to summarise, conclude the research findings and finally make the necessary recommendations to the relevant stakeholders particularly government and KCCA. The informal non-food manufacturing sector in developing countries is growing rapidly and represent the most realistic form of employment to the youth and the marginalised. Many of the workers in the informal non-food manufacturing sector operate in precarious unsafe and unhealthy conditions. Accidents are rarely reported and compensated. The study assessed the occupational safety and health status in the informal non-food manufacturing sector in Kampala City. Various types of occupational hazards inherent in workplaces, knowledge, attitudes and practices, factors affecting implementation of occupational safety and health at work, the glaring legal and policy gaps and compliance to existing occupational safety and health control measures in the informal sector. It provides research conclusions, recommendations and also suggests areas for further research for future studies.

5.2 Summary

The study sought to contribute to understanding of occupational safety and health dynamics and ramifications on the informal non-food manufacturing sector and identify interventions needed in Kampala City, Uganda. The sub sectors were manufacture of metallic products, furniture, textiles and clothing, concrete and bricks, paper and paper recycling, repair of equipment and machinery and other manufacturing such as stone crashing and mat making. Hazards identified were, physical, mechanical, biological, chemical, ergonomic and psychological with different magnitudes. Knowledge on hazards and control measures was moderate and attitude towards the use of control measures was poor apart from the use of PPE and good housekeeping due to low cost of purchase and administration. Age, gender, education level, type of employment, duration at work and use of PPE were the main factors affecting the implementation of occupational safety and health practices at work. There was lack of awareness on OSH regulations and all enterprises had no workplace OSH policies and certificates of machine inspection. Compliance with OSH control measures was low and affected by cost in investment, lack of information and out dated equipment and technology. Suggestions to solving the obstacles included provision of PPE, upgrading technology and

vocational training. A number of recommendations were put forward to improve the situation in the informal sector that included creation of awareness and regulation of the sector by government.

5.3 Conclusions

Occupational safety and health hazards identified included physical hazards such as excessive heat or cold, light (glare), humidity, radiation, noise, vibration, manual heavy lifting. Chemical hazards included paint, solvents, thinner and volatile substances, petroleum fumes and noxious gases. Mechanical hazards included sharp edged machines, pointed edged machines, machines with high powered force, while biological hazards were; flowing sewage, nuisance smells and unsafe drinking water. Also identified were psychological hazards which included stress and fatigue. Other hazards arose from the poor sanitation, open air businesses and confined spaces. Most of the machines were not guarded hence exposing the workers to mechanical hazards in particular. Personal protective equipment /clothing was being used as the commonest measure to prevent hazards at workplaces,

There were low levels of knowledge on hazards and their control measures at work among the employers and employees in the informal sector, although workers took necessary measures to prevent incidents and accidents from occurring like practicing good housekeeping and use of PPE. The attitude on practices was poor although respondents showed a good attitude towards use of PPE and good housekeeping. The low level of knowledge and poor attitude is a result of lack of information, OSH regulations and regulation of OSH by government.

Age, gender, education level and work duration, experience, type of employment and use of PPE were found to affect the implementation of occupational safety and health practices at work. Training, creation of awareness and provision of information to the youth is key in addressing the hazards at work in the sector.

In terms of legislation it was established that there was lack of awareness to OSH regulations while workplace policies and statutory inspection of machinery was absent. This is due lack of regulation by government. Efforts will be required to provide regulations to regulate the sector.

Compliance to occupational safety and health practices was very low due to lack of regulation in the sector, although use of personal protective equipment was rated high as a

control measure for hazards in the workplace, the type and appropriateness was in question. The challenges to compliance of occupational safety and health by workers included; lack of government guidance and support, lack of information and lack of adequate funding to invest in safety programmes and equipment.

Possible solutions put forward to control the occupational hazards were; provision of PPE, upgrading equipment, technology for example getting new and latest machinery, vocational and technical training to acquire more skills in occupational safety and health and collaboration with government and occupational safety and health partners.

5.4 Recommendations

The following recommendations were made based on the findings of the study. Specifically tailored to; Government of Uganda, Kampala Capital City Authority and informal sector employers for easy follow-up and implementation.

5.4.1 Recommendations to Ministry of Gender, Labour and Social Development

i) There is need to initiate an intensive mass media campaign by the occupational safety and health partners for creation of awareness, advocacy and sensitization on occupational safety and health hazards and control measures in the informal sector targeting employers and employees.

ii) There is need to register all informal non-food manufacturing enterprises for occupational safety and health monitoring and inspection.

iii) There is need to develop relevant occupational safety and health regulations, standards and codes of practice.

iv) Government in collaboration with other stakeholders should develop and implement Work Improvement in Small Enterprises (WISE), Work Improvement for Safe Homes WISH) and Work Improvement in Neighbourhood Development (WIND) methodologies to sustainably manage hazards in the informal sector.

v) Government needs to support the informal sector through provision of information, vocational training and acquiring the latest technology to help it play a better role in sustainable development of the country.

5.4.2. Recommendations to Kampala Capital City Authority

i) Kampala Capital City Authority (KCCA) proactively develops strategies to improve and sustain the implementation of occupational safety and health through, creation of

awareness, training and re- training of staff, employers and employees in occupational safety and health in the informal sector.

ii) By law enforcement, all the companies should have occupational safety and health regulations and workplace policies, registered, inspected regularly and provide appropriate PPE to all employees at work.

5.4.3. Recommendations to the informal sector employers

Current efforts in the informal sector towards the management of occupational safety and health are plausible given the lack of regulation. However, there is need for the employers to;

i) Create awareness, training and supervision in occupational safety and health

ii) Provide safe workplaces and safe equipment to the employees to mitigate occupational safety and health hazards.

iii) Acquire the necessary and relevant occupational safety and health regulations for implementation in the sector.

iv) The employers should provide PPE for themselves and the employees.

5.5 Suggested areas for further research

There is need to undertake similar studies in other sectors of the economy to understand and explore the occupational safety and health issues in other sectors sustainable development of the country.

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APPENDICES

Appendix i: Employer's questionnaire

ASSESSMENT OF THE OCCUPATIONAL SAFETY AND HEALTH STATUS IN THE INFORMAL NON- FOOD MANUFACTURING SECTOR IN KAMPALA

Employer's questionnaire/ Work place type and No----------

Dear Respondent.

I'm Stephen Wekoye, Lecturer from Kyambogo University Uganda a PhD student at Egerton University, Kenya. My study supervisors are Prof. Wilkister Moturi of Egerton University and Dr. Stanley Makindi from Machakos University, Kenya. I'm carrying out a survey is to generate data on the occupational safety and health status in Kampala's informal sector and suggest mitigation. The data collected will be used for academic purposes but may also be used to initiate policy interventions in OSH. In order to get the real situation of safety and health status, I would like to ask you some questions. Please answer them as correctly as possible.

Please be assured that your responses will be treated with utmost confidentiality and you are free to withdraw from the interview if you opt to do so

A. SOCIO-DEMOGRAPHIC DATA

1. Age / Age range)_____
2. Gender
   - **(1)** Male
   - **(2)** Female
3. Marital status
   - **(1)** Single
   - **(2)** Married
   - **(3)** Divorced
   - **(4)** Widowed
   - **(5)** Other(specify)_____
4. How you ever been to school/class ?

5. How long have you been working in *Jua kali* sector? (Total duration) _____Month
6. How many hours do you work in a day? _____
7. How many days do you work in a week?_____
8. How many employees do you have?_
9. What is the gender distribution of your staff Male ---- Female _____
10. Apart from management are you also involved in active work?
    0 No
    1. Yes

11. Activities involved in at the work place

Activity	**Yes**	**No**
Soldering / welding		
Painting		
Cutting, splitting and grinding		
Manual lifting and carrying		
Casting and curing blocks		
Planning and jointing		
Marketing and sales		

B. Occupational safety and health legislation

12. Please kindly list any Occupational safety and health legislation, polices or regulations you are currently using in your workplace

a) ----------
b) ----------
c) ----------
d) ----------
e) ----------
f) ----------
g) ----------

13. Please list what you think are good standards of occupational safety and health practices at your workplace

a) ----------
b) ----------
c) ----------
d) ----------
e) ----------
f) ----------
g) ----------
h) ----------

C. Identification and knowledge of workplace hazards

14. Do you think you are at risk of any safety and health hazards that can injure you at this work place?
    0. No
    1. Yes
15. If yes, what level of risk exposure do you perceive?
    0. Low risk
    1. Moderate risk
    2. High risk
16. Please list 5 (five) Safety and health hazards in your workplace
    a) ----------
    b) ----------
    c) ----------
    d) ----------
    e) ----------

17. Please list 5 (five) control measures for hazards in 14 mentioned above to make Work place free from hazards
    a) ----------
    b) ----------
    c) ----------
    d) ----------
    e) ----------

18. In the last one year have you been involved in an accident at work
    0. No
    1. Yes, Approximately how many times ------

19. Have you suffered any occupational work disease or suspected work related illness
    0. No
    1. Yes
    2.
20. Where do you seek health services when affected at work
    0. No where

1. Recommended health facility within the workplace
2. Government facility outside the workplace
3. Private clinic

21. Have you ever had any workplace safety and health awareness/ training

0. No
1. Yes, while at the current job

20. If yes? How many times in the year? ==========

D. Attitudes /perception of occupational safety hazards management

.21. Have you ever adopted any occupational safety and health practices at your work place?

0. No
1. Yes

22. Do you agree that the following preventive measures are important in the control of hazards? Please state on a scale of *1-5 by circling appropriate number on the scale below.

**** 1= strongly disagree2= Disagree, 3= No opinion, 4= Agree, 5= strongly agree***

Control measures	**Response**				
Training and awareness	1	2	3	4	5
Adequate/ appropriate use of PPE	1	2	3	4	5
Fire extinguishers	1	2	3	4	5
Hazard identification	1	2	3	4	5
Occupational safety measures	1	2	3	4	5
Good house keeping	1	2	3	4	5
Incident reporting and registering	1	2	3	4	5
Ensure adequate supervision	1	2	3	4	5
Carrying out risk assessment	1	2	3	4	5
Workplace insurance					

24. For the following questions concerning the use of PPE in prevention of risks please state on the scale of *1-5 whether you;

1= strongly disagree2= Disagree, 3= No opinion, 4= Agree, 5= strongly agree

PPE attitude question	**Response**				
Wearing gloves can reduce damage to your hands	1	2	3	4	5
Wearing masks can reduce damage to respiratory organs	1	2	3	4	5
Wearing safety boot can reduce damage to your feet	1	2	3	4	5
Wearing apron can reduce damage to your body	1	2	3	4	5
Wearing goggles can reduce damage to your eyes	1	2	3	4	5
Wash hand can reduce risks from chemicals	1	2	3	4	5
Bathing after work can reduce damage to health risks	1	2	3	4	5
Wearing ear plugs can reduce damage to your ears	1	2	3	4	5
Wearing hard hat can reduce head injury	1	2	3	4	5

C. Occupational safety and health practices

25. Do you have any person in charge occupational safety and health at your workplace?

0. No

1. Yes

2. Doesn't know

26. Please kindly list any practices for managing safety and health at work**? (*Please tick whichever is appropriate and prop for control measures***

Occupational safety and health practices	**Yes (1)**	**No (0)**	**Adequacy of the measures Good / Bad / None**		
Ensure that all employees are trained in safety measures before work					

Ensure that PPE provided is used					
Ensure good house keeping					
Provision of welfare facilities					
Ensure that there are written polices at work place					
Ensure that operating procedures/ manuals are used					
Ensure that signage is pinned on walls					
Ensure that safety procedures/ Security systems are used					
Ensue that Fire extinguishers are available and checked					
Ensure that there is a perimeter fence around the workplace					
Ensure that incidents and unsafe procedures					
Ensure that First Aid box is used					
Ensure that sanitary facilities are available at work place					
Ensure that risks are identified ant mitigated(risk assessment)					
Ensure that annual audits are done					

E. Compliance with occupational safety and health measures

27. .For each of the following questions please indicate (comparative ranking of measures

****1= Never 2=Rarely, 3= Sometimes, 4= Often, 5= Always,***

Compliance with OSH measures	**Response**				
Always use my PPE for my job	1	2	3	4	5
Always comply with safety practices at work	1	2	3	4	5

Always comply with hazard control measures at work	1	2	3	4	5
I always ask for OSH information					
Comply with reporting incidents and unsafe acts to my supervisor	1	2	3	4	5
I always comply with audit exercises	1	2	3	4	5

28. Indicate whether the following other welfare facilities/utilities are present or absent at the work place

Facilities/Utilities	**Present**		**Absent(0**
	Adequate(2)	**Inadequate(1)**	
Drinking water			
Toilet/Latrine(25 per stance)			
Resting place(bench /chairs)			
First Aid Equipment			
Fire prevention/control equipment			
Waste disposal(domestic)			
Changing room /cloakroom			
Drainage of workplace			

29. Please indicate on the following questions whether you comply with the following questions in the table below*; *1= **Never, 2= rarely, 3= Sometimes, 4= Often 5= Always,***

Acceptance question	**1**	**2**	**3**	**4**	**5**
Do you always comply with safety measures at work?	1	2	3	4	5
Do you always wear personal protective clothing / equipment?	1	2	3	4	5
Do you always report incidents to my superiors?	1	2	3	4	5
Do you always record all incidents in the register?	1	2	3	4	5
Do you always read all instructions before doing dangerous work?	1	2	3	4	5
Do you always avoid unsafe acts at work?	1	2	3	4	5
Do you always wash hands after work?	1	2	3	4	5
Do you always take special precautions while working with sharp objects / machines?	1	2	3	4	5

Do you always use materials hazards sheet / manuals?	1	2	3	4	5
Do you always adhere to safety instructions / rules?	1	2	3	4	5
Do you always keep the workplace clean and organised	1	2	3	4	5
Do you always follow proper work procedures?	1	2	3	4	5

30. What do you think are the main obstacles to safety and health in your work place?

Rate on a scale of *1-5 by circling appropriate number on the scale below

1 = Not a problem, 2 = Minor problem, 3 = Moderate barrier, 4 = Serious barrier 5 =Very serious barrier

Obstacles to compliance	**1**	**2**	**3**	**4**	**5**
Cost investments	1	2	3	4	5
Lack of information on safety and health	1	2	3	4	5
Priority to productivity and profits	1	2	3	4	5
Planning difficulties	1	2	3	4	5
Lack of government guidance and support	1	2	3	4	5
Others (specify)----------	1	2	3	4	5

31. What can you suggest as possible solutions to improving safety and health obstacles? (Indicate its priority by circling the appropriate number based on the scale *1-5 below.

1= Not a priority, 2 = Low priority, 3= Medium priority, 4= High priority, 5= Essential

Workplace safety and health training	1	2	3	4	5
Provision of more PPE	1	2	3	4	5
Collaboration with government agencies and other stake holders	1	2	3	4	5
Upgrading equipment / technology	1	2	3	4	5
Vocational / technical training	1	2	3	4	5
Others (specify)----------	1	2	3	4	5

Appendix ii: Employee questionnaire

ASSESSMENT OF THE OCCUPATIONAL SAFETY AND HEALTH STATUS IN THE INFORMAL NON-FOOD MANUFACTURING SECTOR IN KCCA, UGANDA

Employee /Work place type and No----------

Dear Respondent.

I'm Stephen Wekoye, Lecturer from Kyambogo University Uganda a PhD student at Egerton University, Kenya. My study supervisors Prof. Wilkister Moturi of Egerton University and Dr. Stanley Makindi from Machakos University, Kenya. I'm carrying out a survey is to generate data on the occupational safety and health status in Kampala's informal sector and suggest mitigation. The data collected will be used for academic purposes but may also be used to initiate policy interventions in OSH. In order to get the real situation of safety and health status in the sector, please answer the questions fully and correctly as possible.

Please be assured that your responses will be treated with utmost confidentiality and you are free to withdraw from the interview if you opt to do so.

A. SOCIO-DEMOGRAPHIC DATA

1. Age (age range) _____
2. Gender
   (1) Male
   (2) Female
3. Marital status
   (1) Single
   (2) Married
   (3) Divorced
   (4) Widowed
   (5) Other(specify)____
4. How many years did you spend at school?-_____
5. How long have you been working in *Jua kali* sector? (Total duration)_____ Months

6. How many hours do you work in a day? _____

7. How many days do you work in a week?___

B. Identification and knowledge of workplace hazards

8. Are there any safety and health hazards that can injure you at this work place?

    0. No
    1. Yes

9. Please list 5(five) safety and health hazards in your workplace

    a) ----------
    b) ----------
    c) ----------
    d) ----------
    ----

9. Please list 5(five) control measures for hazards in 10 mentioned above to make Work place free from hazards

    a) ----------
    b) ----------
    c) ----------
    d) ----------
    e) ----------

10. In the last one year have you been involved in an accident at work

    0. No
    1. Yes, Approximately how many times ------

11. Have you suffered any occupational work disease or suspected work related illness

    0. No
    1. Yes

12. Where do you seek health services when affected at work?

    0. No where
    1. Recommended health facility within the workplace
    2. Government facility outside the workplace

3. Private clinic

15. Have you ever had any workplace safety and health awareness/ training?

0. No

1. Yes, while at the current job

2. Yes not at the current job

16. Are you also exposed to any of the hazards listed below?

a)	Extreme noise	1.Yes	2.No
b)	Extreme radiation	1.Yes	2.No
c)	Extreme heat	1.Yes	2.No
d)	Body vibration	1.Yes	2.No
e)	Heavy lifting	1. Yes	2.No
f)	Poor work stations/ organization	1. Yes	2.No
g).	Weather extremes (cold/ hot sun)	1. Yes	2/No

C. Attitude / perceptions of safety hazards and health risks

17. Do you think occupational health risks and safety hazards need attention of employers and government?

0. No

1. Yes

2. Doesn't know

18. If yes why do you think so?

a) ----------

b) ----------

c) ----------

d) ----------

e) ----------

19. Do you agree that the following preventive measures are important in the control of hazards? Please state on a scale of *1-5 by circling appropriate number on the scale below

1= strongly disagree2= Disagree, 3= No response, 4= Agree, 5= strongly agree

Control measure	**Response**				
Training and awareness	1	2	3	4	5
Adequate/ appropriate use of PPE	1	2	3	4	5
Fire extinguishers	1	2	3	4	5
Hazard identification	1	2	3	4	5
Occupational safety measures	1	2	3	4	5
Good house keeping	1	2	3	4	5
Incident reporting and registering	1	2	3	4	5
Ensure adequate supervision	1	2	3	4	5
Carrying out risk assessment	1	2	3	4	5

20. For the following questions concerning the use of Personal Protective Equipment in prevention of risks please state on the scale of 1-5 whether you

1= strongly disagree2= Disagree, 3= No opium, 4= Agree, 5= strongly agree

Attitude question	**Response**				
Wearing gloves can reduce damage to your hands	1	2	3	4	5
Wearing masks can reduce damage to respiratory organs	1	2	3	4	5
Wearing safety boot can reduce damage to your feet	1	2	3	4	5
Wearing apron can reduce damage to your body	1	2	3	4	5
Wearing goggles can reduce damage to your eyes	1	2	3	4	5
Wash hand can reduce risks from chemicals	1	2	3	4	5
Bathing after work can reduce damage to health risks	1	2	3	4	5
Wearing ear plugs can reduce damage to your ears	1	2	3	4	5
Carrying out risk assessment	1	2	3	4	5

F. Occupational safety and health practices

22. Have you ever adopted any OSH practices at your work place

0. No

1. Yes

22. Please kindly list any practices for managing safety and health at work? (***Tick whichever is appropriate)***

OSH practices	**Yes (1)**	**No (0)**	**Adequacy; 1. Good/ 2. Bad/ 3. None**			
Training on safety measures						
Use of PPE provided						
Good House keeping						
Provision of welfare facilities						
Written polices						
Operating procedures/ manuals						
Use of safety procedures/ Security systems						
Fire extinguishers						
Perimeter fencing						
Reporting any unsafe procedure /act						
Use of First Aid box						
OSH audits						

E Compliance of occupational safety and health measures

22. For each of the following questions please indicate whether you comply with the statements below on a scale of *1-5; **1. **Never 2. Rarely, 3. Often, 4.Sometimes, 5 Always,***

Compliance of OSH measures	**Response**				
PPE for my job is always available	1	2	3	4	5
Always comply with safety practices at work	1	2	3	4	5
Always comply with hazard control measures at work	1	2	3	4	5
I always ask for OSH information	1	2	3	4	5

Always comply with reporting incidents and unsafe acts to my supervisor	1	2	3	4	5

23. Indicate whether the following other welfare facilities/utilities are present or absent at the work place

Facilities/Utilities	**Present**		**Absent(0)**
	Adequate(2)	**Inadequate(1)**	
Drinking water			
Toilet/Latrine (25 people/ stance)			
Resting place (seats at workplace)			
First Aid Equipment/box			
Fire prevention/control equipment			
Waste disposal (domestic)			
Changing /cloakroom			
Drainage of workplace			

24. Please indicate on the following questions whether you comply with the following questions in the table below on a scale of *1-5;

1**. **Never 2. Rarely, 3. Often, 4.Sometimes, 5 Always,

Compliance question	**Compliance**		**Non-compliance**		
Comply with safety measures at work	1	2	3	4	5
Wear personal protective clothing / equipment	1	2	3	4	5
Report incidents to my superiors	1	2	3	4	5
Record all incidents in the register	1	2	3	4	5
Read all instructions before doing dangerous work	1	2	3	4	5
Avoid unsafe acts at work	1	2	3	4	5
Wash hands after work	1	2	3	4	5
Take special precautions while working with sharp objects / machines	1	2	3	4	5
Use materials hazards sheet / manuals	1	2	3	4	5
Adhere to safety instructions / rules	1	2	3	4	5
Follow proper work procedures	1	2	3	4	5

25. What do you think are the main obstacles to safety and health in your work place? Rate on a scale of *1-5 by circling appropriate number below;

1 = Not a problem, 2 = Minor barrier, 3 = Moderate barrier, 4 = Serious barrier

5 = Very serious barrier

Cost	1	2	3	4	5
Lack of information on safety and health	1	2	3	4	5
Priority to productivity and profits	1	2	3	4	5
Planning difficulties	1	2	3	4	5
Lack of government guidance and support	1	2	3	4	5
Others (specify)----------	1	2	3	4	5

26. What can you suggest as possible solutions to improving safety and health obstacles?

(Indicate its priority by circling the appropriate number based on the scale *1-5 below.

1= Not a priority, 2 = Low priority, 3= Medium priority, 4= High priority, 5= Essential

Workplace safety and health training	1	2	3	4	5
Provision of more PPE	1	2	3	4	5
Collaboration with government agencies and other stakeholders	1	2	3	4	5
Upgrading equipment / technology	1	2	3	4	5
Vocational / technical training	1	2	3	4	5
Others (specify)----------	1	2	3	4	5

End

Appendix iii: ILO-Workplace Hazard Identification Checklist

ASSESSMENT OF THE OCCUPATIONAL SAFETY AND HEALTH STATUS IN THE INFORMAL NON- FOOD MANUFACTURING SECTOR IN KAMPALA

ILO Workplace hazard Identification Check list **Workplace number----**

Location and type ----------

[A]	**Working Premises /space**	**Yes**	**No**	**N/A Remarks**
1.	Type of work environment			
	a) Open	[ ]	[ ]	[ ]----------
	b) Closed	[ ]	[ ]	[ ]----------
	c) Partially closed	[ ]	[ ]	[ ]----------
	d) Premises fenced/ enclosed?	[ ]	[ ]	[ ]----------
2.	Are the following kept clean and free from waste			
	a) Work station?	[ ]	[ ]	[ ] ----------
	b) Floors surrounding the workstation?	[ ]	[ ]	[ ]----------
	c) Passages surrounding the workstation?	[ ]	[ ]	[ ]----------
	d) Stairways giving access to the workstation	[ ]	[ ]	[ ]----------
	e) Waste containers regularly	[ ]	[ ]	[ ]----------
	f) General environment?	[ ]	[ ]	[ ]----------
3.	Are floors and passages dry and in good repair?	[ ]	[ ]	[ ]----------
4.	Are floors free from obstruction?	[ ]	[ ]	[ ]----------
5.	Appropriate roof used?	[ ]	[ ]	[ ]----------
6.	Appropriate walls used?	[ ]	[ ]	[ ]----------
7.	Are exits including emergency exits free from obstruction, properly marked and unblocked?	[ ]	[ ]	[ ] ----------
8.	Are electric lights and fittings in good working order	[ ]	[ ]	[ ] ----------
9.	Are there any adequate sanitary facilities (25 people stance?	[ ]	[ ]	[ ]----------
10.	Are there any resting facilities at the work place (Bench/chairs)?	[ ]	[ ]	[ ]----------
11	Is there running water on the premises?	[ ]	[ ]	[ ]----------

[B] Type of activity

12. A) Soldering and welding [ ] [ ] [ ]----------

---

b) Painting [ ] [ ] [ ] ----------

c) Cutting and grinding [ ] [ ] [ ] ----------

d) Furniture making [ ] [ ] [ ] ----------

e) Concrete making [ ] [ ] [ ] ----------

f) Brick making [ ] [ ] [ ] ----------

g) Paper making [ ] [ ] [ ] ----------

h) Marketing and Sales [ ] [ ] [ ] ----------

[C] Fire precautions

13. Are the routes and exits kept free from obstruction? [ ] [ ] [ ]----------

14. Are fire extinguishers available and serviced regularly [ ] [ ] [ ] ----------

[D] Workplace hazards

Control Measures

15. Extreme heat at the workplace? [ ] [ ] [ ]----------

16. Extreme weather conditions at the Workplace? [ ] [ ] [ ] ----------

16. Extreme noise at the workplace? [ ] [ ] [ ]----------

17. Excessive optical radiation at the workplace [ ] [ ] [ ] ----------

18. Unsuitable lighting at the work place? [ ] [ ] [ ]----------

19. Inadequate ventilation at the workplace? [ ] [ ] [ ]----------

20. Body vibration at the workplace? [ ] [ ] [ ]----------

21. Floors slippery at the workplace? [ ] [ ] [ ]----------

22. Metals used at the workplace [ ] [ ] [ ] ----------

23. Solvents used at the work place? [ ] [ ] [ ]----------

24. Chemicals / paints used at the workplace? [ ] [ ] [ ]----------

25. Dust generated at the workplace? [ ] [ ] [ ]----------

26. Gases generated at the workplace [ ] [ ] [ ] ----------

27. Heavy lifting/ carrying at the workplace? [ ] [ ] [ ] ----------
28. Workplace a confined space? [ ] [ ] [ ]----------
29. Any repetitive movements at the workplace? [ ] [ ] [ ]----------
30. Working in uncomfortable postures [ ] [ ] [ ] ----------
31. Mechanical and sharp parts/ edges [ ] [ ] [ ] ----------

32. Insects, viruses, bacteria, [ ] [ ] [ ] ----------

[E] Safety of Machinery

33. Eye protection being used? [ ] [ ] [ ]----------
34. Instructions displayed on the machinery? [ ] [ ] [ ]----------
35. Employees using PPE at the workplace? [ ] [ ] [ ]----------
36. Exhaust systems effectively removing the dust/ fumes [ ] [ ] [ ] ----------

37. Guards mounted on the machines? [ ] [ ] [ ]----------
38. Tools used clean and sharp? [ ] [ ] [ ]----------
39. Carried in suitable containers? [ ] [ ] [ ]----------

[F] Availability and use PPE /Clothing

40. Overalls? [ ] [ ] [ ]----------
41. Safety boots? [ ] [ ] [ ]----------
42. Hard hat? [ ] [ ] [ ]----------
43. Nose masks? [ ] [ ] [ ]----------
44. Ear plugs ? [ ] [ ] [ ]----------
45. Hand gloves? [ ] [ ] [ ]----------
46. Eye glasses? [ ] [ ] [ ]----------
47. Fire safety equipment? [ ] [ ] [ ]----------
48. First Aid? [ ] [ ] [ ]----------

[G] Legislation

49. Does the workplace possess the OSH policy? [ ] [ ] [ ]----------

50. Does the work place has OSH regulations [ ] [ ] [ ] ----------

51. Machines have certificates of inspection? [ ] [ ] [ ]----------

[H]Existing management practices at work

52. Provision and use of PPE ? [ ] [ ] [ ]----------

53. Risk assessment [ ] [ ] [ ] ----------

54. Use Signage? [ ] [ ] [ ]----------

55. Good housekeeping? [ ] [ ] [ ]----------

56. Provision of welfare facilities? [ ] [ ] [ ]----------

57. Written messages pinned on walls? [ ] [ ] [ ]----------

58 Security systems? [ ] [ ] [ ]----------

59. Safety and health induction / training / awareness [ ] [ ] [ ] ----------

60. Safety and health audits [ ] [ ] [ ] ----------

Appendix iv: Interview schedule

INTERVIEW SCHEDULE FOR GOVERNMENT OFFICIALS (/NATIONAL / KCCA OSH AND NATIONAL SOCIAL PARTNERS)

Dear Respondent.

I'm Stephen Wekoye, Lecturer from Kyambogo University Uganda a PhD student at Egerton University, Kenya. My study supervisors Prof. Wilkister Moturi of Egerton University and Dr. Stanley Makindi from Machakos University, Kenya. I'm carrying out a survey is to generate data on the occupational safety and health status in Kampala's informal sector and suggest mitigation. The data collected will be used for academic purposes but may also be used to initiate policy interventions in OSH. In order to get the real situation of safety and health status in the sector, please answer the questions fully and correctly as possible.

Please be assured that your responses will be treated with utmost confidentiality and you are free to withdraw from the interview if you opt to do so.

Department: ----------

1) What is your department's mandate concerning occupational health and safety in the country?

2) Do you have the following ILO Standard National Occupational Safety and Health system in place?

International Labour Standards	**Uganda Occupational Safety and Health System**		
	Available (1)	**Un available (0)**	**Remarks**
Ratification of Key ILO Conventions			
OSH Laws			
OSH Policies			
OSH Regulations			
OSH Rules			

OSH MIS			
OSH Codes of practice			
OSH Technical Standards			
Workers' Surveillance System			
OSH Financing			
OSH Governance/ Competent Authority			
OSH Audits			
OHS Committees			
Disputes Arbitration			
OSH training institutions			
National OSH Profile			
OSH Staffing			
OSH Human Resources			
OSH Statistics			
OSH Laboratories			
OSH Information Centre			
OSH Programmes of Action			
Social Security / Insurance Schemes			
Occupational Health Services			
OSH integration into Vision 2040			
International Cooperation and funding			

3. How does your organization ensure safety and health in the informal/ formal service sector?

4). what are the milestones to achieving a safety and health culture where both

Employers and employees accept the importance of safety at the workplace?

5). what are some of the challenges and constraints of ensuring safety and health?

6). what could be the way forward in maintaining safety and health in the informal Sector?

End

Appendix v: Ethical Approval Letter from Makerere University School of Social Sciences, Research and Ethics Committee.

MAKERERE UNIVERSITY

P .O. Box 7062,
Kampala, Uganda
Cables: MAKUNIKA

Tel: 256-41-545040/0712 207926
Fax: 256-41-530185
E-mail: makssrec@gmail.com

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
SCHOOL OF SOCIAL SCIENCES
RESEARCH ETHICS COMMITTEE

Your Ref:
Our Ref: MAKSS REC 02.18.133

25th April 2017

Stephen Wekoye Aurice
Principal Investigator (MAKSS REC 02.18.133)
Kyambogo University
P O Box 1
Tel: + 256 782 363566
Email: swekoye@gmail.com

Initial review – Full Board
Re: Approval of Protocol titled ""Assessment of Occupational Health and Safety status of the informal Non-food manufacturing sector in Kampala City, Uganda""
This is to inform you that, the Makerere University School of Social Sciences Research Ethics Committee (MAKSS REC) granted approval to the above referenced study. The MAKSS REC reviewed the proposal using the full board review on **22nd February 2018**. This has been done in line with the investigator's subsequent letter addressing comments and suggestions.

Your study protocol number with MAKSS REC is **MAKSS REC 11.17.099.** Please be sure to reference this number in any correspondence with MAKSS REC. Note that, the initial approval date for your proposal by **MAKSS REC was 22nd February 2018.** This is an annual approval and therefore; approval expires on **21st February 2019**. **You should use stamped consent forms and study tools/instruments while executing your field activities at all times.** However, continued approval is conditional upon your compliance with the following requirements.

Continued Review
In order to continue on this study (including data analysis) beyond the expiration date, Makerere University School of Social Sciences (MAKSS REC) must re-approve the protocol after conducting a substantive meaningful, continuing review. This means that you must submit a continuing report
Form as a request for continuing review. To avoid a lapse, you should submit the request six (6) to eight (8) weeks before the lapse date. Please use the forms supplied by our office.

Makerere University School of Social Sciences Research Ethics Committee
Valid Thru:
21 FEB 2019

1

Please also note the following:

- No other consent form(s), questionnaires and or advertisement documents should be used. The Consent form(s) must be signed by each subject prior to initiation of my protocol procedures. In addition, each research participant should be given a copy of the signed consent form.

Amendments

During the approval period, if you propose any changes to the protocol such as its funding source, recruiting materials or consent documents, you must seek Makerere University School of Social Sciences Research and Ethics Committee (MAKSS REC) for approval before implementing it.

Please summarise the proposed change and the rationale for it in a letter to the Makerere University School of Social Sciences Research and Ethics Committee. In addition, submit three (3) copies of an updated version of your original protocol application- one showing all proposed changes in bold or "track changes" and the other without bold or track changes.

Reporting

Among other events which must be reported in writing to the Makerere University School of Social Sciences Research and Ethics Committee include:

i. Suspension or termination of the protocol by you or the grantor.
ii. Unexpected problems involving risk to participants or others.
iii. Adverse events, including unanticipated or anticipated but severe physical harm to participants.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human subjects in research.

The legal requirement in Uganda is that, all research activities must be registered with the National Council for Science and Technology. The forms for this registration can be obtained from their website www.unsct.go.ug

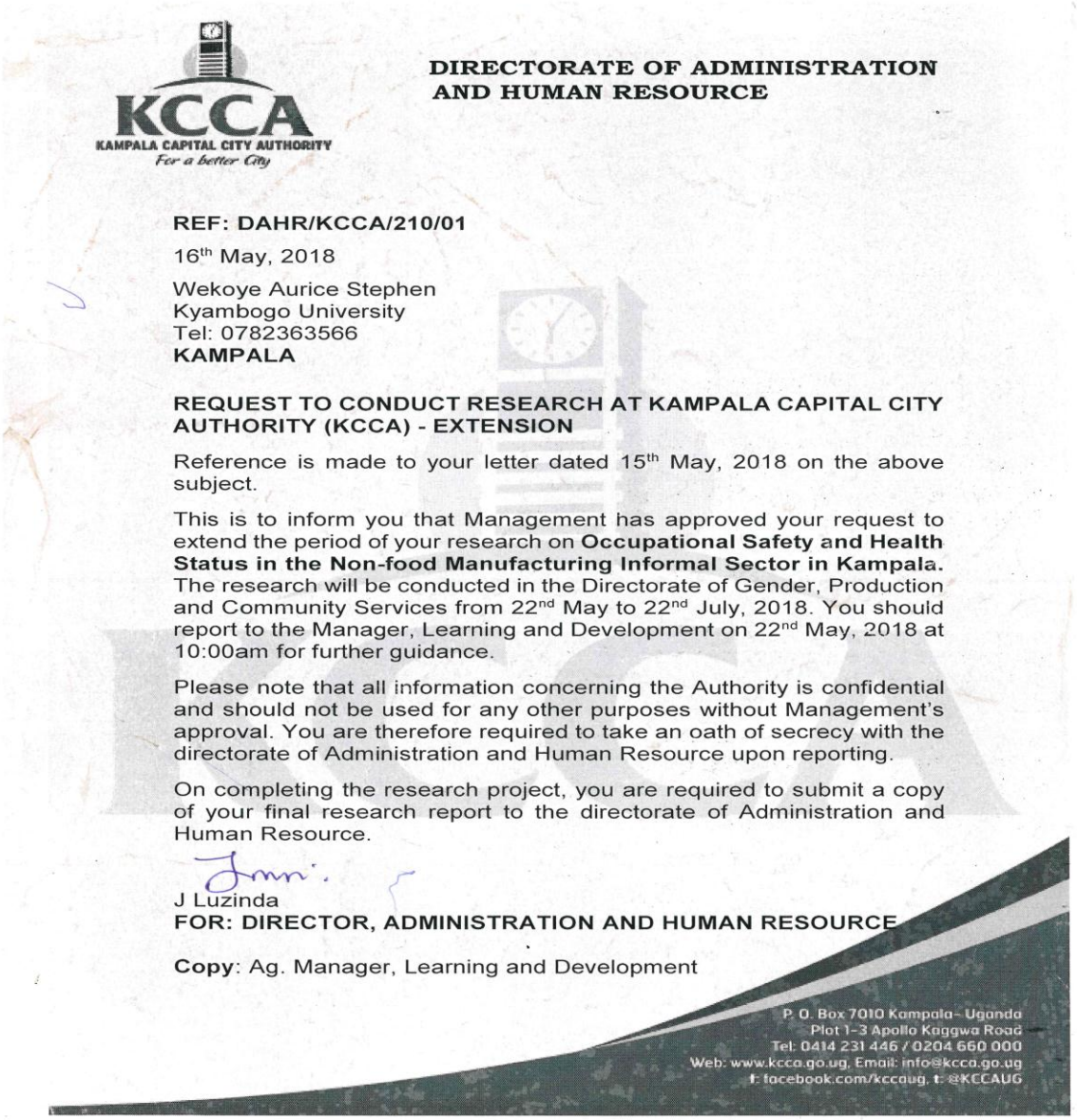
Please contact the Administrator of Makerere University School of Social Sciences Research and Ethics Committee at makssrec@gmail.com OR bijulied@yahoo.co.uk or telephone number +256 712 207926 if you counter any problem.

Yours sincerely,

Dr. Stella Neema
Chairperson
Makerere University School of Social Sciences Research and Ethics Committee

c.c.: The Executive Secretary, Uganda National Council for Science and Technology

Appendix vi: Permission from Kampala Capital City Authority.



KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

DIRECTORATE OF ADMINISTRATION AND HUMAN RESOURCE

REF: DAHR/KCCA/210/01

16th May, 2018

Wekoye Aurice Stephen
Kyambogo University
Tel: 0782363566
KAMPALA

REQUEST TO CONDUCT RESEARCH AT KAMPALA CAPITAL CITY AUTHORITY (KCCA) - EXTENSION

Reference is made to your letter dated 15th May, 2018 on the above subject.

This is to inform you that Management has approved your request to extend the period of your research on **Occupational Safety and Health Status in the Non-food Manufacturing Informal Sector in Kampala.** The research will be conducted in the Directorate of Gender, Production and Community Services from 22nd May to 22nd July, 2018. You should report to the Manager, Learning and Development on 22nd May, 2018 at 10:00am for further guidance.

Please note that all information concerning the Authority is confidential and should not be used for any other purposes without Management's approval. You are therefore required to take an oath of secrecy with the directorate of Administration and Human Resource upon reporting.

On completing the research project, you are required to submit a copy of your final research report to the directorate of Administration and Human Resource.

J Luzinda
FOR: DIRECTOR, ADMINISTRATION AND HUMAN RESOURCE

Copy: Ag. Manager, Learning and Development

P. O. Box 7010 Kampala - Uganda
Plot 1-3 Apollo Kaggwa Road
Tel: 0414 231 446 / 0204 660 000
Web: www.kcca.go.ug, Email: info@kcca.go.ug
f: facebook.com/kccaug, t: @KCCAUG

Appendix vii: Permission from Ministry Of Gender, Labour and Social Development

TELEPHONE: +256 414341034
Switchboard: +256 414347855
FAX: +256 414256374
E-MAIL: ps@mglsd.go.ug
WEBSITE: http//www.mglsd.go.ug

In any correspondence on
This subject please quote No. **OSH/87/231/01**

THE REPUBLIC OF UGANDA

Ministry of Gender, Labour
and Social Development
P.O. Box 7136
KAMPALA
Uganda

19th February, 2018

Mr. Wekoye Aurice Stephen
Kyambogo University
P.O. Box 1, Kyambogo
KAMPALA

PERMISSION TO ACCESS DATA IN OCCUPATIONAL HEALTH AND SAFETY IN KAMPALA CAPITAL CITY

Reference is made to your letter dated 24th December, 2017 on the subject. This is to inform you that the Ministry of Gender, Labour and Social Development has granted you permission to access the data on Occupational Safety and Health status in the informal non-food manufacturing sector in Kampala. Please work closely with the Department of Occupational Safety and Health for all the necessary arrangements. On completing the research project, you will be required to share findings of your final research with the Ministry.

The purpose of this communication is therefore to inform you that you have been granted permission to access the data on Occupational Safety and Health status in the informal non-food manufacturing sector in Kampala.

Please ensure that you obtain the relevant approval in line with the laws of Uganda.

David Mugisa
For: PERMANENT SECRETARY

Appendix viii: Research Permit from National Council of Science and Technology

Uganda National Council for Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

Our Ref: SS 4603 **18th June 2018**

Mr. Stephen Aurice Wekoye
Principal Investigator
Kyambogo University
Kampala

Dear Mr. Wekoye,

Re: Research Approval: Assessment of the Occupational Health and Safety Status of the Informal Non – Food Manufacturing Sector in Kampala City, Uganda

I am pleased to inform you that on **01/06/2018**, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period of **01/06/2018** to **01/06/2019**.

Your research registration number with the UNCST is **HS 4603**. Please, cite this number in all your future correspondences with UNCST in respect of the above research project.

As Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the research protocol or the consent form (where applicable) must be submitted to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activation of the changes. UNCST must be notified of the approved changes within five working days.
3. For clinical trials, all serious adverse events must be reported promptly to the designated local IRC for review with copies to the National Drug Authority.
4. Unanticipated problems involving risks to research subjects/participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST review.
5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.
6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project.

LOCATION/CORRESPONDENCE

Plot 6 Kimera Road, Ntinda
P. O. Box 6884
KAMPALA, UGANDA

COMMUNICATION

TEL: (256) 414 705500
FAX: (256) 414-234579
EMAIL: info@uncst.go.ug
WEBSITE: http://www.uncst.go.ug

Uganda National Council for Science and Technology
(Established by Act of Parliament of the Republic of Uganda)

Below is a list of documents approved with this application:

	Document Title	Language	Version	Version Date
1.	Research proposal	English	1.0	February 2018
2.	Informed consent forms	English	3.0	May 2018
3.	Questionnaires	English	1.0	February 2018
4.	ILO – workplace hazard identification checklist	English	1.0	February 2018
5.	Interview guides	English	1.0	February 2018

Yours sincerely,

Isaac Makhuwa
For: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Copied to: Chair, Makerere University School of Social Sciences, Research Ethics Committee.

LOCATION/CORRESPONDENCE

Plot 6 Kimera Road, Ntinda
P. O. Box 6884
KAMPALA, UGANDA

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TEL: (256) 414 705500
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EMAIL: info@uncst.go.ug
WEBSITE: http://www.uncst.go.ug

Appendix ix: Sector activities in the study area

Plate 1: Informal non-food manufacturing sector activities in Kampala City

1(a)

1(b)

1(c)

1(d)

Source: Field photos by the researcher

Plates 1a, b, c, d: Various metal products in the study area in Kampala city, Uganda

Plate 2: Textile and cloth making in Kawempe Division

3(a) **3(b)**

Plate 3(a) and (b): Furniture moulding and sand papering for tables tops in Kawempe Division

Plate 4: below shows one of the businesses making Shade stands (concrete and Brick manufacture) in Nsambya, Makindye Division.

Plate 4: Concrete productsmaking-Nsambya

Appendix x: Chi-Square Analysis of variables on occupational safety and health practices

		Practices of OSH		Chi	P
Variable	**Category**	**Adequate**	**Inadequate**	**Square**	**Value**
Gender	Male	257 (66.3)	171 (40.1)	23.9	0.003
	Female	131 (33.7)	117 (30.2)		
	30 Years & Below	51 (11.2)	12 (3.80)		
Age of respondents	31-40 Years	176 (55.9)	37 (9.50)	51.3	0.000
	41-50 Years	144 (22.5)	85 (21.9)		
	51 years & Above	74 (16.7)	61 (15.7)		
	Single	39 (10.10)	1 (0.001)		
Marital status	Married	266 (68.5)	22 (16.6)	17.1	0.002
	Divorced	63 (16.2)	32 (8.20)		
	Widow	44 (11.3)	40 (10.3)		
	Illiterate	41 (10.5)	19 (4.80)		
Education level	Primary	72 (18.5)	17 (4.70)	147.3	0.000
	Secondary	93 (24.5)	54 (13.9)		
	Higher	128 (32.9)	188 (44.5)		
Period working in Juakali	1-5 years	69 (17.9)	74 (19.1)		
	6-10 years	95 (24.5)	111 (28.6)	87.5	0.002
	10 years and	177	83 (21.4)		

	above	(45.6)			
	0 employees	58 (14.9)	65 (16.8)		
Number of employees at work	1-3 employees	86 (22.2)	87 (22.4)	69.9	0.000
	4-5 employees	157 (40.5)	83 (21.4)		
Hours spent at work	1-8 hours	61(15.7)	90(23.2)	19.8	0.004
	9 and above hours	327(84.3)	298(76.8)		

Source: Primary data