

UNIVERSITY OF NAIROBI
FACULTY OF ARTS
SOCIOLOGY OF DEPARTMENT

**THE IMPACT OF OCCUPATIONAL HAZARDS ON
THE HEALTH OF METAL WORKERS IN KENYA'S
JUA KALI SECTOR: A CASE STUDY OF
KAMUKUNJI METAL WORK CLUSTER IN
NAIROBI**

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EAST AFRICANA COLLECTION**

Declaration

I declare that this research project report is my original work and has not been presented for a degree in any other university. No part of this report may be reproduced without prior permission of the author or the University of Nairobi.

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MR. GEOFFREY R. NJERU

Dedication

I dedicate this research project to Almighty God for His grace that enabled me to go through the course successfully. I also dedicate this research project to my dear husband Stephen Mwaura, and our lovely children Violet, Margaret, Fiona and Kelvin for their patience, understanding and support through prayers. Without them I would not have made it.

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Special thanks go to the respondents at Kamukunji for sacrificing their time to avail the information I needed for the study.

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Over and above all I wish to record my sincere gratitude to God Almighty for granting me the wisdom and understanding of writing this research paper to him all the glory and honour are His.

Abstract

The focus of this study was to examine how the work place can be improved to prevent any exposure or harm on the health of the Kamukunji metal workers. It also identified the various hazards brought about by their nature of work, and the surrounding environment.

The impact of these hazards was also looked at and their effects on the worker, business and the rest of the family members. The review captured various studies done by various researchers in the area of interest. The theoretical framework was based on two main theories Chaos Theory and Rational Choice Theory.

The study area was Kamukunji Jua Kali market in Nairobi. The study focused on all the various production activities carried out in this sector. A sample of 70 workers comprising of both employers and employees was interviewed together with 3 key informants from the Kamukunji Jua Kali Association.

The study used descriptive statistics to summarize and interpret the qualitative information collected. The findings were presented using frequency tables, pie charts and pictures where applicable.

The findings established that the metal cluster workplace does have a wide range of hazards and hence most workers are exposed to the various hazards either through their nature of work or environment. The researcher therefore recommends that there is need for a systematic assessment of Occupational Health Hazards, practices and outcomes so as to help assess how economic and production policies are affecting Occupational Health. The cost of such impacts and the potential benefits to be gained from investment in prevention, should be enhanced by a regulatory framework that ensures that regulations are enforced and penalties are used as a deterrent for non enforcement.

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List of Abbreviations and Acronyms

DOHSS	:	Directorate of Occupational Health and Safety Services
GDP	:	Gross Domestic Product
GoK	:	Government of Kenya
HBEs	:	Home Based Enterprises
ILO	:	International Labour Organization
MSE	:	Medium and Small Enterprise
NEMA	:	National Environmental Management Authority
OSH	:	Occupational Safety and Health
PPE	:	Personal Protective Equipment
SPSS	:	Statistical Package for Social Sciences
WCF	:	Workmen's Compensation Fund
WHO	:	World Health Organization
ZOHSC	:	Zimbabwe Occupational Health and Safety Council

CHAPTER ONE: INTRODUCTION

1.1. Background to the Study

According to the international labour organization [ILO] the term informal sector will refer to very small-scale units producing and distributing goods and services ,and consisting largely of independent, self-employed producers in urban areas of developing countries, some of whom also employ family labour and or a few hired workers or apprentices; which operate with very little capital ,or none at all; which utilize a low level of technology and skills; which therefore operate at a low level of productivity; and which generally provide very low irregular incomes and highly unstable employment to those who work in it (Forasheri, Valentina (2000:1).

They are informal in the sense that they are for most part unregulated and unrecorded in official statistics; they tend to have little or no access to organized markets, to formal credit institutions, to formal education and training institutions or to many public services and amenities; they are not recognized, supported or regulated by the government; they are often compelled by the circumstances to operate outside the framework of the law; and even where they are registered and respect certain aspects of the law they are almost invariably beyond the pale of social protection, labour legislation and protective measures at the work place. Informal sector producers and workers are generally unorganized.....and in most cases beyond the scope of action of trade unions and employer's organizations....they generally live and work in appalling, often dangerous and unhealthy conditions even without basic sanitary facilities, in the shanty towns of urban areas (Forasheri, Valentina (2000:1).

Pressures from the on-going globalization of the world's economy, liberalization of trade and rapid technological progress are forcing many countries to change their employment patterns and organization of work in order to stay competitive. This fosters competitiveness based on seeking higher productivity and "quality" of the products at a lower cost, compromising the quality of working conditions. In this context, prevention and protection are not seen as an integral part of quality health management, but as a barrier to trade (Forastieri, 2000:2). This situation is resulting in inadequate safety and health standards, environmental degradation and a lack of basic social protection for workers. When the total costs resulting from injury, illness and disability are taken into account in calculating the true costs of production, it is evident that high productivity and quality employment can only be reached when requirements for the prevention of accidents and diseases and the protection of workers' health and welfare are integrated in the management of the production process.

Some studies have been done in dealing with the informal sector in the area of health promotion and protection, although, never with a comprehensive strategy. However, evidence suggests, that with the appropriate support, informal sector workers can move from a situation of mere survival to a stronger economic position enhancing their contribution to economic growth and social integration, as well as participating in the improvement of their own working and living conditions. In order to raise their productivity it is necessary to develop measures which effectively combine services to enable micro-enterprises to increase both their incomes and services to assist workers in protecting their health and improving their working conditions. (Loewenson, 1997).

1.1.1. Metalwork in Kamukunji Nairobi

Kamukunji market is a large, busy cluster of tinsmiths, where nearly two thousand artisans fashion a variety of metal products, including tin trunks, charcoal stoves, security bolts, cooking pots, griddles, bicycle carriers, and wheelbarrows (Frijns et al. 1997; King 1996: 55-57; Undugu Design Unit 1995; Haan 1995; McCormick 1998). The clusters location between the industrial area and the country bus station make it accessible to both supply and product markets.

Most firms use craft-based production methods and very simple technology (Frijns et al. 1997). Fewer than 10% have the electricity connections that are essential to higher technology production. The majority use hand tools or simple hand-operated machines to make products of new and/or used sheet metal. Production processes are slow and products poor quality. Workshops with electricity undertake welding, engineering, and fabrication work, frequently making to order rather than for the market. Their products include door and window grills, metal brackets, hinges, door bolts and latches, bicycles parts and simple machines.

In Kamukunji market the fact that most small-scale enterprises are family based and mainly operate outside the main institutional regulatory framework means that they are rarely supervised. Even if they are covered by Law, their standards of safety and health are so low that they hardly meet the requirements for registration as places of work.

Occupational accidents and diseases are rarely reported and never compensated hence such businesses are not covered by the National Social Security and Health Insurances

Schemes and when old age or ill health affects their operations, many of the enterprises go under.

The explosive growth of the informal sector has brought with it more hazards than before. These include physical hazards, biological hazards, mechanical, chemical and psychological hazards.

Other constraints commonly observed by occupational health and safety officers are: many of the small-scale entrepreneurs in Kamukunji market use obsolete production methods and substitute raw materials of inferior quality. There is also multiple exposures to different hazards especially in cluster zones, due to an excessive number of both people and products in the workplaces.

There is also a frequent lack of Personal Protective Equipment and clothing and the very small workshops suffer from poor house keeping and tools. Materials are usually out of reach and working postures causing strain are common.

At Kamukunji Metal Work Cluster Sanitary facilities are non-existent and premises are very makeshift hence exposing workers to all types of weather. Lack of fire fighting equipment means that the number of fire outbreaks is high as fires are lit near flammable materials.

1.1.2. Economic Context for Jua Kali Metalwork

Kamukunji caters for a large low-income consumer market in Nairobi and up-country towns in Kenya, and also supplies certain products, such as manufacturing products,

agricultural tools (farm implements products that take the biggest percentage) most of the clients are wholesalers who always buy similar products from several producers, and individuals (Frijns et al 1997). Most of the Kamukunji products are of low quality with few variations. This can be attributed to many factors that result from finance constraints to health problems that the workers experience. The demand of such items is slowly decreasing as consumers gain access to higher standard goods from other producers and sellers like supermarkets and retail shops. Thus, although the potential market continues to grow with Kenya's increasing population, the size of the market currently served may be shrinking since these problems affecting the workers in the sector are not tackled.

Kamukunji market has the potential for realizing scale economies. Fabricated metal workshops in middle and low income countries suggesting that the one and two-person establishes in the market are probably economically inefficient. Realizing economics of scale would, however, mean changing the organization of production from its present craft to one using division of labour. This would, in turn, require standardizing parts to a degree that is difficult to achieve with hand tools. Economies of scale especially managerial economies and concurrent scale economies should be available to these businesses. Realizing such economies of scope will also entail changing the prevailing form of production and the health hazards that has come out as one strong hindrance to development to this factor as there is no health cover for the workers.

Jua Kali workers face many dangers within their employment. The sector is primarily unrecognized and unregulated businesses. Many employees therefore, face environmental

and health risks. The World Bank lists the most prevalent of these risks as follows: I) The constant threat to workers from the presence of hazardous substances; ii) Dangerous working conditions and unsafe work practices; iii) Inadequate, or non-use of, protective equipment; iv) Inappropriate work site location; v) Lack of health facilities such as first aid clinics and proper sanitation services; vi) Information deficiencies; vii) Low priority given by entrepreneurs and workers to problems; and finally viii) Diminished productivity due to sickness and injury (World Bank, 2002: 2). Many of these risks are associated with the workplaces of Jua Kali businesspeople. They literally work “under the hot sun,” with little protection from the falling or flying objects. Because their businesses are so close together, contaminants from one business (such as fumes from metal-working) may also affect the people around that business (Getman, 2004:52).

The dangerous as well as illegal nature of some Jua Kali professions denies employees benefits such as health care (Getman, 2004:53). Jua Kali workers find gaining access to doctors and health care almost completely impossible. Even such elementary measures as heat safety could help workers improve their quality of life and become more economically productive. Srinivas and Pallen (2004:2) note that although people do become acclimatized [to severe heat], most of these workers, as a result of the combined effects of malnutrition and exposure, suffer from headaches, heat cramps, and dizziness. Their report goes on to note that noxious gases which are produced as a result of their trades, commonly affect both mechanics and metalworkers (Srinivas and Pallen, 2004:9). However, due to the highly labour intensive nature of their trades, many workers cannot

leave their businesses for extended periods of time to attend safety workshops, even if the workshops are subsidized by an outside network.

1.2. Problem Statement

Despite the Kamukunji Jua Kali metal work cluster in Nairobi having been in existence for more than two decades now, the occupational hazards associated with metalwork are scantily known to the workers, their employers and academics. So is the impact of such hazards on the health of the individuals involved and the spillover effects on their families and other dependants. Many workers are known to have died due to health complications arising out of the nature of their work. In other cases, the resultant medical bills have depleted family savings and thrust such families into poverty. In still other cases, sole bread winners have been maimed or rendered blind by failure to use appropriate protection gear (McCormick, 1997:8). Despite this grim scenario, little research has been done to address these problems and no solutions have been found hence this study will seek to investigate and come up with suggestions and lasting solutions to the unfortunate scenario.

1.3. Research Questions

The study sought to answer the following questions:

- a) What occupational hazards affect metal workers within the Kamukunji cluster?
- b) In what ways do these occupational hazards affect their health?
- c) What is the impact of these effects on the workers, their livelihood and rest of the family?

1.4. Objectives of the study

The study's main objective was to establish how occupational hazards in the workplace affected the health of Kamukunji metal workers in Nairobi.

The study sought to achieve the following specific objectives

- a) To establish the various occupational hazards that have affected metal workers within the Kamukunji cluster.
- b) To identify the various ways these occupational hazards have affected their health.
- c) To establish how the impact of these occupational hazards have affected the workers', their businesses and their spillover effects on the rest of the family members.

1.5. Justification of the Study

Although a lot had been written on occupational safety and health, inadequate Safety and health standards and environmental hazards were still evident in the case of the Jua-Kali sector. The workers did not have the necessary awareness, technical means and resources to implement health and safety measures. The protection of the health and welfare of workers in this sector was a challenge which should have been faced with an integrated approach to health promotion, social protection and employment creation. The study focused on the development of innovative means to prevent occupational accidents and diseases and environmental hazards at the work-site level. Further study findings were used that were included in the sensitization of policy makers, municipal authorities and labor services to change traditional role towards a preventive and promotional approach.

1.6. Scope and Limitations of the Study

The study was carried out in Kamukunji market. It is located along Jogoo Road and is one of the largest Jua Kali markets in the country. The study focused on the metal work cluster within the market. This included enterprises with a minimum of less than 20 employees and a capital of not more than Kshs. 50,000 hence meeting the basic descriptions of informal sector enterprises. The study focused on the issue of awareness in the case of safety and health standards and environmental hazards as pertains to the Jua Kali sector. The study was limited to lack of cooperation from the respondents in providing information due to suspicion that it may be used against them, and result in their dismissal from work. However, the researcher was able to convince them that it was for their own benefit hence the significance of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter presents a review of the related literature on the subject under study presented by various researchers, scholars, analysts and authors. The research has drawn materials from several sources which are closely related to the theme and the objectives of the study.

2.1.1 Definition of the Informal Sector

In economics, the term informal sector (or second economy in the South Africa context) refers to all economic activities that fall outside the formal economy regulated by the state. It refers to the general income category (or sector) wherein certain types of income and the means of their generation are “unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated”.

Simply put, it is economic activity that is neither taxed nor monitored by a government; and is not included in that government’s Gross National Product (GNP); as opposed to a formal economy.

Although the informal economy is often associated with developing countries where up to 60% of the labour force (with as much 40% of GDP) works, all economic systems contain an informal economy in some proportion. The term “informal sector” was used in many earlier studies, and has been mostly replaced in more recent studies which use the newer term.

The informal economy under any governing system is diverse and includes small-scaled, occasional members (often street vendors and garbage recyclers) as well as larger, regular

enterprises (including transit systems such as that of Lima, Peru). Informal economies include garment workers working from their homes, as well as informally employed personnel of formal enterprises.

The above definition rejects the inclusion of certain activities including crime and domestic labor. Crime cannot be included because such acts have no regulated counterpart against which they may be compared. (Of course, by their nature, informal economic activities escape regulation and may then become criminal). Domestic labor, such as childcare and cooking, cannot be included when performed in the natural course of daily living and to one's own benefit. Such activities can easily be performed for others and exchanged for goods and services with economic value and depending on broader conditions, these can be either formal or informal economic activities. However, when performed for personal benefit they have no external economic value (they cannot be exchanged).

Statistics on the informal economy are unreliable by virtue of the subject, yet they can provide a tentative picture of its relevance. For example, informal employment makes up 48% of non-agricultural employment in North Africa, 51% in Latin America, 65% in Asia, and 72% in sub-Saharan Africa. If agricultural employment is included, the percentages rises, in some countries like India and many sub-Saharan African countries beyond 90%. Estimates for developed countries are around 15%.

In developing countries, the largest part of informal work, around 70%, is self-employed in developed countries, wage employment predominance. The majority of informal economy workers are women. Policies and developments affecting the informal economy have thus a distinctly gendered effect.

2.1.2 Definition of the Jua Kali Sector

The term “informal sector” was popularized by a 1972 study of Kenya, but Kenyans have another term for the sector: Jua Kali, literally “under the hot sun”. It is indicative of the severe conditions under which micro-entrepreneurs and their employees labor. This unstructured sector has emerged as a result of the incapacity of formal, regulated industries to absorb new entrants. The jua kali sector encompasses small-scale entrepreneurs and workers who lack access to credit, property rights, training, and good working conditions. Originally restricted to artisans, the term has come to include a number of professions, including auto mechanics and market vendors. They supply goods to local markets using predominantly manual labor and little capital, often making do with handmade tools. Their livelihoods are constantly threatened by arbitrary seizures and other forms of harassment by authorities.

Many Kenyans consider the jua kali to be the predominant and most important economic sector in Kenya, the one in which they all work. This is not far from the truth. According to the Economic Survey published by Kenya’s Central Bureau of Statistics, employment within the sector increased from 4.2 million persons in 2000 to 5.1 million persons in 2002, accounting for 74.2% of total employment. The sector contributes 18.4% of the gross domestic product and provides goods and services, promotes creativity and innovation, and enhances entrepreneurial culture. A common statement heard throughout Kenya is “We’re all jua kali nowadays”.

2.1.3 What challenges do the Jua Kali face?

Although they constitute the majority of Kenya's economy, jua kali businesses face numerous challenges.

A number of cumbersome laws and regulations remain out of step with current realities and are hostile to the growth of the informal sector. The by-laws applied by many local authorities are not standardized and appear to be punitive instead of facultative in most cases. Even worse, informal entrepreneurs generally do not know the laws and their rights. The role of the provincial administration in enforcement of regulations and its jurisdiction over land and utilities tend to overlap and conflict with those of the local authority. The bureaucratic, lengthy process of transacting business with government agencies adversely impacts informal traders by diverting their scarce resources from production to sheer housekeeping.

The Jua Kali are unable to secure ownership over their shops or land, as property rights are neither granted nor enforced. Developers frequently encroach onto their workplaces. One of the main reasons why Jua Kali business owners have difficulty gaining access to credit is that they have no land or property to use as collateral.

Weak property rights are compounded by deficient infrastructure. The poor state of Kenya's roads adds to the cost of goods produced by the informal sector rendering them less competitive than imported goods. Their workshops and stands lack electricity and running water. The health care facilities available to them are inadequate at best, especially for a population with a high percentage of HIV infection.

Other challenges include a legal and policy framework for financial services that favors large over small borrower, a shortage of information on markets, and inadequate access to skills training and technology.

The Jua Kali has received a mixed response to their needs from the government. On the surface, the government appears sensitive to the Jua Kali sector's needs a number of policy papers produced by the government highlight the importance of the sector to job creation, poverty reduction, and meeting consumers' demands. The government has passed laws and allocated funds to facilitate small enterprise development, improve working conditions, and ease access to credit, basic utilities, and property rights., the government has also envisioned providing vending space to Jua Kali businesses, for instance by closing roads at certain times.

Despite the government's seemingly good intentions, these policy papers and laws have had a minimal impact due to implementation difficulties or unresponsiveness on the part of government officials. Policies have been formulated mainly by the government without consulting the Jua Kalis. As a result, policies failed to address the specific needs of the Jua Kali sector and lacked ownership by them. When commitments have been made, no organization has effectively monitored implementation. Local authorities continue to harass informal businesses by arbitrary arrests, chasing them from their temporary business locations, confiscating their goods and other tools of trade, causing property damage, asking for bribes, and at times, even assaulting the entrepreneurs.

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2.2. Overview of the Informal Economy

The informal sector provides low-cost goods and services that are affordable to both the low and middle-income citizens who cannot afford to pay high prices. Intense competition keeps prices at low levels. It is an important and growing part of the overall economy in most developing countries. For example in Peru, the sector accounts for 38 per cent of GDP and 60 per cent of all man hours worked and its development is viewed as nothing short of revolutionary (Ghersa Enrique, (1997:18). The informal sector in Kenya has been growing faster than the formal sector, and consequently providing more opportunities for employment. In 1999, the sector comprised 1,289,012 micro and small enterprises (MSEs) contributing 18.4 per cent to GDP and involving up to 3.7 million persons (Government of Kenya [GoK], (1999:43). The number of persons involved in the informal sector rose to 4.2 million in the year 2000 representing an annual growth rate of 11 per cent. In aggregate terms, the urban areas absorb the greatest number of MSE workers, representing nearly two-thirds of total MSE sector employment (GOK Economic Survey, 2001:12). Nairobi alone accounted for nearly a quarter (24.06 per cent) of total employment in the sector.

The informal sector of the economy is traditionally held to have a number of distinct characteristics, such as ease of entry, the predominance of self employment, labour intensive production methods, low levels of organization, low productivity and income (ILO 1972:16; GOK et al, 1999:44; Wells, 2001:32). Individuals working within the sector work in an environment of uncertainty. However, unlike the formal economy, the

sector is highly flexible, and entrepreneurs can quickly change their activities to respond to particular market needs (Mullei and Bokea, 1999:8).

2.3. Occupational Safety and Health at the Workplace

Despite the progress made in the improvement of working conditions and environment and the efforts undertaken by all those concerned with occupational safety and health, the workplace remains a hazardous environment. Occupational health hazards are common in many economic sectors and affect large numbers of workers. The number of work accidents and the incidence of occupational injuries and diseases are still too high worldwide (Forastieri, 2002:2). The (ILO) estimates show that each year about 200,000 workers lose their lives and as many as 120 million are injured or become ill as a result of work. Some 68-157 million new cases of occupational disease are caused by various exposures at the workplace and dangerous working conditions of which about 30-40 per cent may lead to chronic disease and about 10 per cent to permanent work disability. A large number of occupational diseases go undiagnosed and unreported.

To protect and promote the health of workers, an occupational health service has to meet the special needs of the enterprise it serves and the workers employed in it. With the enormous range and scope of industrial, manufacturing, commercial, agricultural and other economic activities, it is not possible to lay down a detailed programme of activity, a pattern of organization and conditions of operation for an occupational health service which should be suitable for all enterprises and in all circumstances. The (ILO) *Occupational Health Services Convention No.161*, (1985), defines occupational health

services as "services entrusted with essentially preventive functions and responsible for advising the employer, the workers and their representatives in the undertaking on the requirements for establishing and maintaining a safe and healthy working environment, which will facilitate optimal physical and mental health in relation to work, and the adaptation of work to the capabilities of workers in the light of their state of physical and mental health". Provision of occupational health services means carrying out activities in the workplace with the aim of protecting and promoting workers' safety, health and well-being, as well as improving their working conditions and the working environment. These services are provided by occupational health professionals functioning individually or as part of special service units of the enterprise or of external services (Forastieri, 2002:3).

According to the (ILO) *Occupational Safety and Health Convention No.155*, (1981), and the (ILO) *Occupational Health Services Convention No.161*, (1985), the prime responsibility for health and safety of workers rests with the employers. The functions of an occupational health service are to protect and promote the health of workers, improve working conditions and the working environment and maintain the health of the enterprise as a whole by providing occupational health services to workers and expert advice to the employer on how to achieve the highest possible standards of health and safety in the interests of the particular working community of which it is a part.

The (ILO) *Occupational Health Services Convention No.161* and its accompanying Recommendation No.171 envisage occupational health services as multidisciplinary,

comprehensive and although essentially preventive, also allow for carrying out curative activities. The World Health Organization documents calling for services for small-scale enterprises, the self-employed and agricultural workers encourage the provision of services by primary health care units. These documents and national laws and programmes recommend a stepwise implementation so that the occupational health activities can be adjusted to the national and local needs and prevailing circumstances.

2.4. Impact of occupational Hazards and Risks at the Workplace

Assessment of the health impact of occupational risks is important for social recognition of these occupational risks, to plan and facilitate adequate interventions for their prevention and to adequately manage the health burdens they cause. The International Labour Organization and World Health Organization have since compiled information on the global health burden due to occupational risks. At a recent WHO/ILO meeting (Geneva, July 1997), it was raised that non-wage or informal sector employment merits further attention given the fact that information on this sector is limited and poorly quantified.

The right to life is the most fundamental right. Yet every year 1.2 million [as of 1999; 2, 2 million according to 2005 figures] men and women are deprived of that right by occupational accidents and work-related diseases. By conservative estimates workers suffer 250 million [as of 1999; 270 million according to 2005 figures] occupational accidents and 160 million [according to both 1999 and 2005 figures] occupational diseases each year. Deaths and injuries take a particularly heavy toll in developing countries, where large numbers of workers are concentrated in primary and extractive

activities such as agriculture, logging, fishing and mining - some of the world's most hazardous industries (Somavía, 2006:1). This social and economic burden is not evenly distributed. Fatality rates in some European countries are twice as high as in some others, and in parts of the Middle East and Asia fatality rates soar to four-fold those in the industrialized countries with the best records. Certain hazardous jobs can be from 10 to 100 times riskier. Likewise, insurance coverage for occupational safety and health varies widely in different parts of the world: workers in Nordic countries enjoy nearly universal coverage while only 10 per cent or less of the workforce in many developing countries is likely to enjoy any sort of coverage. Even in many developed countries, coverage against occupational injury and illness may extend to only half the workforce.

The health problems reported in the literature on the informal sector are generally the same as in the formal sector, with a common presence of poor housekeeping, poor lighting, long work hours, poor work place design, and unawareness of chemicals risks and increased use of drugs as home medication. Job-related risk factors are compounded by overcrowding, poor nutrition and other public health problems, inadequate sanitation, lack of adequate storage and the more general effects of poverty (Loewenson, 2000:4). For metalwork artisans for instance, the problems go beyond the worker and involve risks for the worker's family and work environment. The exposure of artisans to poor working conditions can lead to their suffering from occupational diseases especially when they are directly involved in the work.

A survey of automotive and machinery repair and metalworking urban informal sector in the Philippines found a range of hazards, including long working hours, poor housekeeping, inadequate welfare facilities, ventilation and lighting, poor work postures and work methods, chemical exposure and inadequate provision of personal protective equipment (PPE). Piece-rate systems were also found to make working hours irregular and work habits of the workers unsafe. Long hours without regular breaks, repetitive movement, fixed working position and prolonged visual concentration were commonplace for simple one-step outsourced work tasks such as gem cutting, net repair, garment gluing and ribbon making. At peak seasons the workers rush to work with lack of regard for safe working methods (Vasquez, 1992: 58). The study further established that informal sector worksites have inadequate washing facilities, lockers or separate eating areas for workers, no first aid kits and an inadequate supply of clean water. Few informal enterprises have fire extinguishers. Workspaces are often limited, with emergency exits blocked by cluttered passageways and obstructed by wires and cables. Tools, raw materials, scrap and empty containers are scattered over the shop floor and worksites with earth floors have both rubbish and dust on the floors. Awkward work positions (e.g. bending, squatting and lying underneath cars in auto repair shops) are common, with poorly designed stools and benches leading to musculoskeletal problems due to constant neck and low back flexion (Vasquez, 1992: 60). Similar conditions characterize the Jua Kali artisan within the Kamukunji metal Works cluster.

According to Loewenson (2000:6), the use of complex machinery is not common among informal sector workers and high noise levels have not been commonly reported, mainly

because of the low degree of mechanization. Where old, unguarded machinery is used, hazards present relate to moving parts such as drive belts. More commonly experienced mechanical hazards arise due to pulling threads, knives, scissors and needles and other sharp hand tools. Indoor workplaces have been reported to be hot during summer months, and although few report poor lighting, more experience problems of poor task lighting for work tasks requiring concentrated vision.

Depending on the type of process, informal sector workers are exposed to common chemicals as in the formal sector. Problems arise of exposure in all family members when production takes place in the home, such as due to drying products and open containers left in the living area. Chemicals with acute effects are more commonly recognized than those with chronic effects (Vilegas, 1990:12). For example, loss of eye sight is reported in jewellery home workers from splashes of acid solutions (e.g. boric, muriatic, nitric acids and caustic soda) and gold dusts and powder chemicals (e.g. borax or potassium nitrate) that accidentally make contact with the eyes. Chemicals used by home workers in jewellery Home Based Enterprises (HBEs) in the Philippines (e.g. boric, sulfuric, nitric acid, cyanide and caustic soda) led to eye and respiratory disorders. Similar problems were reported in the handicraft sectors due to organic dusts.

The common factors that undermine workplace safety in MSEs are: 1) low levels of capital, use of primitive tools and techniques and a tendency to innovate or take shortcuts in production that, while necessary for economic survival, may pose serious hazards to the worker; 2) poor working conditions, poorly regulated by labour or health and

safety laws and poorly monitored by unions, employer's organizations and the state, as workers such as those working for their families are not always under formal contracts of employment (Zimbabwe Occupational Health and Safety Council [ZOHSC] 1997:8). These problems are particularly acute in the categories of labour common in informal and small-scale enterprises, such as child, casual, family and female labour; the majority of small holders and a large proportion of informal sector workers are female, while many small rural and urban enterprises also employ children, and poor access to information, lack of knowledge, about hazards, their effects and controls and pressure to generate an income 'at whatever cost'.

Detection and control of occupational exposures depends on a system of monitoring and management at the level of the workplace and at the national level (Loewenson, 1997:14). In Africa, factory inspectorate systems have inadequate staff and resources to implement laws relating to the work environment, which are themselves often neither specific nor comprehensive. Countries such as Kenya, Mauritius, the Seychelles and Zimbabwe are now establishing laws and practices for workplace safety committees in order to localize monitoring and to promote legislative obligation for the dissemination of hazard information to manufacturers and employers.

A small-scale enterprise may not fulfill the definition of a 'factory' in the law governing inspections or may not de facto be monitored owing to shortages of inspectors, time and transport (Sitas et al, 1988:23). A small-scale enterprise may have too few workers to be required legally to have a safety committee (such as in Namibia and Mauritius). Workers

and employers in such enterprises are less well organized and thus less well informed of their rights to health and safety, of advances in work environment practices and of workplace hazards, greatly inhibiting effective monitoring of exposures (Loewenson, 1997:15).

2.5. Theoretical Framework

A theory is a set of interrelated constructs, definitions and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena (Kerlinger, 1964:11). These studies uses the following sociological theories to try and explain how the artisans' health status is affected by the nature of occupational hazards and risks they are exposed to.

2.5.1. Chaos Theory

Chaos prevents a stable strategy of problem solving (Klaus, 1994). This new appreciation for chaos has led to an understanding of both the non-linearity of the world in which we live and of the functional aspects of instability as a means for adapting to new situations. Chaos is one possible result of the dynamics of nonlinear systems. Non-linearity refers to behaviour in which the relationships between variables in a system are dynamic and disproportionate. In nonlinear systems small changes or small errors can have big effects. And, in nonlinear systems outcomes are subject to high levels of uncertainty and unpredictability. In nonlinear systems behavior is erratic and filled with surprises. Our world is filled with non-linearity (Kiel, 1994:188). One of the advantages of viewing the world from the lens of chaos theory or nonlinear dynamics is that we begin to see that the world is actually filled with flux and change. The world is, from this perspective, an

infinite array of time series of system all marching to their own unique drummer. While pattern and similarity occur the unique elements of each system's organization and environment represent that nuance that lead to unique evolutionary outcomes.

Occupational risks and hazardous situations epitomize the non-linearity of human events. These are events in which the relationship between relevant variables is churning. Even in our desire to create order and control the situation, events often seem to churn one step ahead of our best efforts. Heinz (1988:56) noted that, "life is... nonlinear. And so is everything else of interest." Clearly, what makes hazards at the workplace particularly interesting and challenging is the inherent non-linearity in such events. To better understand the relevance of nonlinear dynamics to the effects of occupational hazards and risks for workers in the Jua Kali sector, a brief introduction to the elements of dynamical systems theory is necessary. Dynamic systems comprise two elements. These elements are (1) the area or field on which the "action" or "motion" takes place (the formal label for this region is the "manifold of states") and (2) the set of rules that determine the motion or action in the field of action that lead to results achieved in the field of action, (these rules are called "vector fields") (Casti, 1990: 54-55). The field of action, or the "workplace", for metalwork artisans is determined by the nature of the work and the technology used to perform the work. Their field of action is quite different from the office environment of an employee in the formal sector. Hazards and workplace disasters may also occur in unexpected areas. Thus even the field of action itself may be highly unpredictable for response actions (Kiel, 1995).

In chaos theory, there is always a movement from inert (cosmos) to a chaotic system. Constant monitoring or vigilance makes the systems checked, therefore reducing the likelihood of exposure to dangers. Surveillance lengthens the period of movement from Cosmos to Chaos. Entropy itself has been defined in various ways. For instance, entropy could mean transformed or decreased energy, which has been dissipated by functions into random motion of molecules and which cannot be retrieved. "The Entropy of an isolated system always increases", and when two systems are joined together the entropy of the combined system is greater than the sum of the entropies of the individual systems. For instance exposure of workers to hazardous working condition puts their health status at risk where prevention and control mechanisms are lacking (Kiel, 1994:189).

2.5.2 The Rational Choice Theory

The Rational Choice Theory is a micro theory. It promotes the notion that human beings are rational and that their actions may involve both rational and non-rational (value oriented) elements, human beings calculate the likely costs and benefits of any action before deciding what to do, and mostly take the action that brings them the most benefit at the least cost (Scott, 2000: 647). The benefit need not be quantifiable, it could be qualitative like the approval one derives from fulfilling a social obligation or conforming to expected social behavior.

Rational choice theory was first coined by George Homans in 1961 and was based on the theory of social exchange. Earlier scholars like Max Weber, Talcot Parsons and Bronislaw Malinowski all argued that society is made up of individual human interactions (social exchanges) based on reciprocity and social obligations (Scott, 2000:

648). Talcot Parsons used the social action concept to explain human behavior, based on the reward and punishment model. Human beings will consciously abuse the actions that promise reward and avoid those that result in punishment for them. The argument is that all human action is motivated by what they stand to gain rather than lose. All human interactions therefore are processes of exchange. Economic actions involve exchange of goods and services, while social interaction involves exchange of approval and other valued non-monetary rewards.

Rational Choice Theory argues that what may appear on surface to be complex social phenomena or systems is in fact a multiplicity of individual human actions. The individual is the elementary unit of society, and individual human action is the elementary unit of social life which arises out of the actions and interactions of individuals. While other theories may focus on reciprocity and social obligation as motivating human action, Rational Choice insists that human action is purely rational and calculative (Homans, 1961: 67). Individuals are motivated by the goals and wants that best express their “preferences. With these “preferences” in mind, human beings make rational choices between different options after weighing the accruing benefits and/or consequences. The goals and/or wants of the individual are what motivate them to take the actions they take, based on the information they have about the situation under which they are acting. In rational choice, two scenarios exist, the individual preferences (or alternatives) and the constraints faced by the individual in actualizing their preferences. Since it is not possible for the individual to achieve all the things they want, they must carefully weigh the possible outcomes of each alternative course of action, and cost

involved. The rational individual will choose the option that is likely to give them the utmost satisfaction of the least cost. People also make rational choices based on their past experiences as well as those of others, and the rewards or punishments that accompanied the experience (s) (Scott, 2000: 650).

The use of Rational Choice Theory in this study was meant to show that the Kamukunji Metal workers given equal access to information and productive resources would make the rational choice prevent further health impacts on themselves as a result of their working environment. They would be able to adopt strategies that would help mitigate such occurrences affecting their health. Most people who have adequate information know that working in Jua Kali sector without using Personal Protective Equipment can be life threatening to ones health, hence will consciously make the rational choice to use these protective equipments always. However because humans are rational beings, they will weigh all options and chose the action that minimizes their loses as much as possible no matter the circumstances. This study therefore sought to explore and document the challenges the people of Kamukunji metal work cluster face, and make recommendations on how they can be assisted to make rational choices to prevent the spread of and mitigate the impact of occupational hazards on their livelihoods.

2.5.3 Copying Theory

Copying is a dynamic process which involves a series of reciprocal responses between individuals and the environment. Thus, copying responses are not a monetary occurrence but rather a chain of interactions which take place over time. Folkman (1991) argues that

threatening situations or events automatically lead to the development of a coping mechanism.

When individuals are confronted with an event, a first step towards coping with it is to make a primary appraisal of events in terms of whether the event is judged to be threatening to the individual. If threatening a further appraisal is made in which the individuals assess what resources and potential coping strategies are at the moment and available to deal with the stressor, that is the degree to which they can exercise control over the stressor, and in choice of further coping strategies. If the individuals judge the stressors in the positive, they are likely to engage in problem focused coping. If they judge that they have insufficient resources, the next step may be to increase these resources by finding more information or rallying sources of support. A feeling of powerlessness may lead to emotional focused coping (Folkman and Lazarus, 1991 and Taylor (1986).

In regard to Occupational Hazards which are the stressor in the case of this study amongst metal workers in Kamukunji, we relate coping to the ability to device consumption against certain calamities which endanger the physical continuity of life. These survival or coping strategies are used to pull through the period of crisis. The concept of coping strategies is used by many economies. It is focused on household behavior under adverse conditions, but the underlying concept of crisis and what it constitutes and how it comes about has to be clarified in the particular case.

For our purpose Occupational Hazards can cause periods of depression in livelihood levels brought about by loss of employment, poor health and absenteeism from work. When such conditions are of a recurrent nature, one needs to speak of the process rather than discuss the situation with the aid of static concepts like Misery; hence people have to device mechanisms to deal with the crisis at hand.

When such conditions are of a long term nature to the extent that they affect livelihoods, one need to speak of the process of ensuring livelihoods and mechanisms. To deal with ways of enhancing precautions amongst affected persons so as to prevent such occurrences.

It is generally held that the poor and crisis prone settlements have often been much better strategists than the development planners, but existing options make survival of possibility and sometimes an ongoing certainty. The general assumption is that after a crisis, the people require copying strategies to rebuild their lives but in a large number of cases, rebuilding these lives to the level the people were at before the incidence is usually impossible. The best copying strategy is to ensure that these Occupational Hazards do not occur at all.

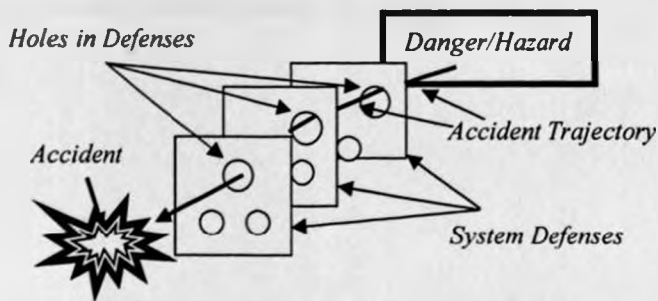
2.6. Conceptual Framework

Attitude is described as driving behavior (Booth-Butterfield, 1999:2). Whether single-worker accidents or organizational disaster managerial actions concerning workplace ergonomics and safety can be described as a set of behaviors driven by attitudes about ergonomics and safety. Manager attitudes towards worker safety and welfare have

changed dramatically over the last century. In 1893 an American railroad executive publicly remarked that it was cheaper to bury a worker killed in a rail accident than to install air brakes on a railcar (Hammer, 1981: 8). Today, a similar attitude would be deemed unacceptable. On a general basis, this change in attitude is, as mentioned in the introduction, reflected in occupational statistics such as the worker death rate and in tacit manager support of ergonomic and safety programs that prevent single worker accidents.

The study applies the conceptual approaches developed by Reason (1997) in showing the impact of occupational hazards on the health of metal workers in Kenya’s Jua Kali sector. Reason (1997: 22) made a powerful argument in support of the need for day-to-day managerial involvement in ergonomics and safety. He likens preventative measures to a series of barriers that serve to defend against occurrence of accidents and disasters at the workplace. These barriers are described as not being perfect; there are holes in each barrier that, when aligned, are penetrated and then result in accidents and disasters. Figure 2.1 illustrates this concept.

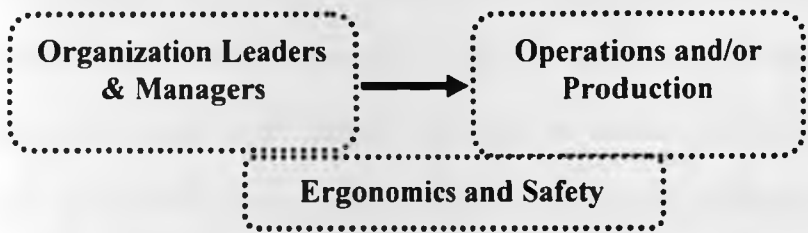
Figure 2.1: Workplace Accident Causation Model.



Source: Adapted from Reason (1997:22)

When describing this model Reason (1997: 22) notes that the actual accident or disaster is usually caused by actions that occur well in advance of the actual event. He goes on to attribute most causation to management decisions that create conditions that make it possible for the actual event to take place. In effect, managers have neglected or been ignorant of safety factors, causing their organization and workers to be vulnerable. Similarly, the review of literature by Stubbs, Danielsson & Ohlsson (1999:46) found that other researchers identify management action/attitude as being a critical factor in organizational disaster prevention. As may be seen in Figure 2.2, a model where ergonomics and safety is integrated with all levels of an organization seems to be the optimum prevention strategy. By being an integral part of the organization, ergonomics and safety becomes a part of an entire process.

Figure 2.2: Ergonomics and Safety integrated into the organization/workplace



Source: Adapted from Stubbs, Danielsson & Ohlsson (1999: 46)

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Chapter Overview

This chapter presented a description of the study site, sources of data, and methods of data collection and analysis of collected data. It gave a description of research design, sampling methodologies, and data collection tools and data analysis methods.

3.1 Site Selection and Description

Kamukunji *Jua Kali* cluster is one of the largest in Kenya. It has a population of nearly two thousand artisans who deal with a variety of metal products, including tin tracks, charcoal stoves, security bolts, cooking pots, griddles, bicycle carriers and wheel barrows. The clusters location which is between the Nairobi's industrial area and the country bus station makes it accessible to both the supply and product markets. Most of the Kamukunji products are of low quality with few variations. This can be attributed to many factors that result from finance constraints to health problems that the worker experience. The demand of their items is slowly decreasing as consumers gain access to higher standard goods from other producers, supermarkets and retail shops. Thus, although the potential of the market continues to grow with Kenya's increasing population, the size of the market currently served may be shrinking since these problems affecting the workers in the sector are not tackled.

3.2 Research Design

Research design is the plan of procedures for data collection and analysis that are undertaken to evaluate a particular theoretical perspective. The research design involves the entire process of planning and carrying out a research study (Miller, 1975:12). It is all the procedures or steps undertaken to ensure an objective test of the theory under investigations (Guy, 1981:19). A survey research was adopted for this study because it was considered as a conventional research method which allowed the use of questionnaire to obtain information from the interviewees. It sought to obtain information that described existing phenomena by asking individuals about their perceptions, attitudes and behaviour and due to its convenience in collecting comprehensive data from large samples in a short period of time (Mugenda and Mugenda 1999: 165).

3.3. Unit of Analysis

Units of analysis are the objects or events under study (Singleton et al., 1988: 69). This includes individuals, social roles, positions and relationships in organizations and social groupings. The unit of analysis for this study was the Kamukunji metal work cluster. The idea was to measure the impact of occupational hazards on the health of metal workers in Kamukunji.

3.4. Unit of Observation

Units of observation were entities or objects from which the study data was to be obtained. In this study, the physical features of the Kamukunji workshops, the workers, and their environment were the units of observation.

3.5. Sample Selection

The main objective of sampling is to secure a sample within which, subject to limitation of size, will reproduce the characteristics of the population as closely as possible. Singleton et al (1988: 130) defines sampling as the seeking of knowledge or information about a population by observing a part of this population in order to extend the findings to the entire population. Kerlinger (1988:131) observes that planning and logistics of observation are more manageable with a sample. Thus sampling procedures can be compared to a mirror, which gives true reflection of the origin.

Due to the larger population of Jua Kali artisans in Kamukunji, the study used stratified sampling procedure to cover the entire market. The market was stratified into six clusters comprising of 15 workers each, based on the nature of wares they produced.

- 1) Home appliances
- 2) Agricultural Tools
- 3) Repair Services
- 4) Construction tools

In each of these clusters, the study used unstructured and structured questions to interview the respondents.

The researcher also purposively selected 3 key informants who were representatives from the Kamukunji Jua Kali Association. They comprised of the Chairman, Secretary and Treasurer. Beins (2004:105) argues that purposive sampling is used when the researcher selects participants because of some desirable characteristics, like expertise in the areas.

3.6 Data Collection Methods and Tools

A respondent's survey was conducted. A questionnaire with both open and close ended questions was utilized and administered through face to face interviews on the metal workers. The open-ended questions gave room for the respondents to provide additional information, while the close ended questions provided answer options from which the respondents could choose from.

An interview guide was constructed and used to conduct in- depth interviews with key informants. Checklists of questions were used to guide personal interviews with key informants, who included the Chairman, Secretary and Treasurer of the Kamukunji Jua Kali Association. The key informants provided information on the areas of when the business started operational challenges, regulations, environmental management, performance and sustainability of the sector.

The observation technique was used to collect accurate information on the endeavor of the various health facilities in provision of health care safety. Polgar and Shane (1995:149) define observation as involving being close to the things such that the observer is in a position to directly perceive and record specific aspects of the environment under study. Observations were used to capture any information that was not captured through the interviews, which included the state of the facilities.

Secondary data was collected from books, journals, unpublished research work and magazines. The information gathered from the above tools highlighted the health impact

on the metal workers obtained opinions on the quality of work being offered, the role of the employer, and other stakeholders, performance and sustainability of services being provided.

Pictures were also taken with permission from the respondents and they gave a general view of the area its various activities and health impact on the workers.

3.7. Data collection procedures

The questionnaires were administered by the interviewer through face to face interviews. The interviewer carried along an introduction letter detailing the purpose of the study and was expected to seek consent from the Kamukunji Jua Kali Association to conduct the interview. In-depth interviews with the key informants were administered by the researcher through face to face interview. An introduction letter detailing the purpose of the study was sent to the identified key informants before the appointments were made. A confirmation of the appointment and agreeing on the suitable date and time was done before the researcher went out to conduct the interviews. Permission from the respondents to take photographs was granted hence pictures have also been used to give impression of the presented findings.

3.8. Data Analysis

Data analysis consists of examining, categorizing, and tabulating the evidence to address the initial propositions of the study. In this study both quantitative and qualitative data analysis techniques were used to compliment each other. The statistical Package for Social Sciences SPSS was used to analyze quantitative data. Frequency tables and

percentages were generated to present the collected data. Descriptive statistics were presented in form of cross tabulation and frequency tables displaying the collected information to show the relationship between two different variables. Coding and assigning labels to the variables was done. Data was organized into common themes and arranged systematically to show common similarities and differences which were then discussed in the findings. Multiple methods were used i.e. observation and face to face interviews which were given high priorities on the validity of the collected data.

CHAPTER FOUR: RESEARCH FINDINGS

4.1. Introduction

This chapter presents a descriptive analysis of the data gathered in relation to the impact of occupational hazards on the health of Metal Workers in Kamukunji, Nairobi. The study used descriptive statistics to summarize and interpret the qualitative information collected. The findings are presented using frequency tables, pie charts, and pictures where applicable. This presentation is based on the questionnaires administered, unstructured interviews held and observations made. The study achieved a response rate of 85% since 15% of the questionnaires were incomplete and therefore considered invalid out of a sample size of 70 respondents. The information generated from these questionnaires was complemented by that from key informants. The chapter is organized into sections and/or sub-sections.

4.2. Demographic Characteristics of the Respondents

4.2.1. Age and Gender Distribution

The findings presented in Table 4.1 indicate the age distribution amongst the sample respondents. A majority of the sample respondents (46.7%) were aged between 21 and 30 years while 38.3% were aged between 31 and 40 years. Only (10%) of the respondents were aged above 41 years. The high proportion of the youthful group may signal the large number of school leavers entering the informal market. It could also be that the monotonous and routine nature of the *Jua Kali* activities in Kamukunji necessitates more

energetic people. That this may be so is corroborated by the findings that males constitute a large majority of the respondents (86.7%), as further shown in Table 4.1.

Table 4.1: Age and Gender Distribution amongst Sample Respondents

Variable	Category	Number of responses	% of the total
Age of the respondents	Below 20 years	3	5.0
	21-30 Years	28	46.7
	31-40 Years	23	38.3
	41-50 Years	6	10.0
	Total	60	100.0
Variable	Category	Number of responses	% of the total
Gender of the respondents	Male	52	86.7
	Female	8	13.3
	Total	60	100.0

Source: Field Data (2008)

4.2.2. Level of Education Attained

Table 4.2 below presents findings on the levels of education attained by the sampled respondents. The findings indicate that a majority of the respondents were semi-literate with 65% being primary school leavers and 35% having attained secondary education. The relatively high number of secondary school leavers entering the *Jua Kali* sector indicates that there is potential for information flow through the informal sector using written and other media and that educational status should not be a major limiting factor for uptake of information on occupational safety and health.

Table 4.2: Highest Level of Education Attained

Level of Education	Number of responses	% of the total
Primary Level	39	65.0
Secondary Level	21	35.0
Total	60	100.0

Source: Field Data (2008)

4.2.3. Establishment of Metalwork Businesses at Kamukunji

Table 4.3 presents findings on the approximate periods within which the workshops were established. The findings indicate that a cumulative majority of the sample respondents (61.6%) established their metalwork workshops between the years 1990 and 2000. This increase was occasioned by frequent presidential visits to Kamukunji *Jua kali* sites, thereby giving presidential decrees to put-up sheds for the metal workers; and the subsequent introduction of Sessional Paper No 2 of 1992 on Small enterprises and Jua Kali Development in Kenya. This was a turning-point, partly because the shed provided at least a few businesses with much needed shelter from the sun and rain, but more importantly because of the new legitimacy the presidential decree afforded the entire open-air small-manufacturing sector. Unfortunately, this support, which was to be further developed in policy documents, was not well translated into practice (McCormick 1996).

Table 4.3: Periods of Formation of Metalwork Workshops at Kamukunji

Year of Formation	Number of responses	% of the total
1980 to 1989	3	7.7
1990 to 1995	12	30.8
1996 to 2000	12	30.8
2001 to 2005	5	12.8
2006 to 2008	2	5.1
Not Applicable	5	12.8
Total	39	100.0

Source: Field Data (2008)

4.2.4. Registration and Licensing of Metalwork Businesses

Table 4.4 presents findings regarding the legal status of the businesses in regard to compliance to licensing requirements for small-scale businesses in Kenya. The findings indicate that one-third of the sample businesses (33.3%) were found to be registered and

licensed. However, it is evident that 50% of the workshops were not registered nor licensed as metalwork production sites. The licenses mainly comprised business permits that are issued by the Kamukunji Jua Kali Association. Only 16.7% of the workshops were reported to be registered.

The findings of Table 4.4 therefore imply that most of the metal workers at Kamukunji do not consider business registration to be a vital tool in driving the growth of their businesses, as well as attaining recognition from the relevant authorities. The licensing system provides an opportunity for communicating information on occupational health and compensation provisions to informal sector workers but reaching unlicensed work places is more difficult due to relaxed regulatory and licensing frameworks.

Many of these clusters operate without licenses whether from the Department of Public Health of the Nairobi City Council, National Environmental Management Authority (NEMA), or Occupational Safety and Health (OSH) Department of the Ministry of Labour. The study reported that due to lack of licensing things to do with physical facilities, hygiene, workplace organization and ergonomics were never addressed since there was no one to do inspection. Policy guidelines and procedures did not exist in this sector; hence no one complied with any law or regulation in regard to Occupational Safety and Health (OSH). The other reason these businesses like being unlicensed are so as to remain informal hence avoid paying government taxes and levies.

Table 4.4: Registration and Licensing Status of the Businesses

Registration/Licensing Status	Number of responses	% of the total
Registered	10	16.7
Registered and Licensed	20	33.3
Not registered and not licensed	30	50
Total	60	100.0

Source: Field Data (2008)

4.2.5. Employment Status of the Sampled Respondents

The findings presented in Table 4.5 indicate the employment status of the sample respondents. The findings indicate that the greater share of metal workers 40% were business owners and therefore self employed. Those employed as casual workers constituted 26.7% of the sample, while 15% of the respondents were permanently employed in their respective businesses. The remainder of 18.3% was composed of trainees. Information from key informants showed that most casual workers start as trainees, who later graduate to permanent workers, and subsequently start their own businesses. The findings therefore imply that most of the businesses were managed by the owners, with support from technical staff who are employed on either temporary or permanent basis. The findings further imply that there is high potential for job-creation from the businesses within the metalwork cluster, given that most of the businesses are not fully operated by the owners. The ability of this sector to provide employment for the ever-increasing number of entrants to the labour market, including those being pushed out of formal employment, is widely acknowledged. Given a shrinking public sector workforce and a marked slowdown in overall economic activity which has occasioned massive retrenchments in the private sector, the informal economy has recently been providing the greatest opportunities for employment.

Table 4.5: Employment Status of Sample Respondents

Employment Status	Number of responses	% of the total
Employer/business owner	24	40.0
Paid permanent	9	15.0
Paid casual	16	26.7
Trainees	11	18.3
Total	60	100.0

Source: Field Data (2008)

4.2.6. Occupational Skill Levels of Respondents

Table 4.6 presents findings regarding the levels of occupational skills attained by the sample respondents interviewed. The findings indicate that a majority of them 66.7% considered themselves to be skilled by way of “on-the-job training. In addition, 25% were found to be semi-skilled while the remaining 8.3% were unskilled. The findings indicate that there is little training in the informal metalwork sector and skills are often acquired through in-service forms of training. The possibility exists for including occupational safety and health information in the curriculums applied to train the metalwork artisans. On the other hand, it means that those who transmit skills, such as through apprenticeships, should also know how to communicate information on assessment and reduction of occupational risks to the apprenticeship trainees or interns. It needs to be determined whether such knowledge exists and if not how it can be developed or enhanced. If the current metal workers are trained on ways of avoiding occupational health hazards, this information can subsequently be passed on to the on-job trainees. This then presents an effective and economical way of reducing occupational hazards in their work place.

Table 4.6: Occupational Skill Levels of the Sample Respondents

Occupational Skill Level	Number of responses	% of the total
Skilled (on the job training)	40	66.7%
Semi Skilled	15	25%
Unskilled	5	8.3%
Total	60	100.0

Source: Field Data (2008)

4.2.7. Nature of Wares Produced

Table 4.7 presents findings regarding the nature of hardware and appliances produced by the sample respondents at their metal workshops in Kamukunji. The findings indicate that 43.3% of the sample respondents specialize in production of agricultural tools and materials, while 16.7% produce home appliances. The latter include “jikos”, metallic boxes, and home tools. Production of construction tools and provision of repair services each accounted for 20% of the artisans’ sample. The findings imply that a majority of the artisans specialize in production of hardware tools which require observance of safety standards at the workshop hence the need to provide the workers with information on occupational safety at their work places.

Table 4.7: Nature of Wares Produced by Kamukunji Metal Workers

Nature of Products	Number of responses	% of the total
Home Appliances	10	16.7
Agricultural Tools	26	43.3
Repair Services	12	20.0
Construction tools	12	20.0
Total	60	100.0

Source: Field Data (2008)

4.3. Nature of Workplace Exposure

The first research question had sought to determine the nature of workplace exposures that have contributed to the poor health of metal workers. The extent of workplace exposure was evaluated using four aspects namely: 1) workplace environment; 2) physical layout of the workplace; 3) psycho-social exposures; and 4) chemical exposures. The findings are presented in the sub-sections below.

4.3.1. Work Environment

Table 4.8 presents findings on various types of hazards identified at the sampled metal work stations. The most common hazards relate to the work environment that is, mechanical hazards which accounted for 50%. It has to do with the use of low degree of mechanization. More commonly experienced mechanical hazards arise due to pulling threads, knives, scissors and needles and other sharp hand tools.

Other types of hazards include Physical hazards 25%. These have to do with poor general lighting, loud noise, exposure to direct sun or fire, heat and dust pollution.

Ergonomic hazards 16.7% arise as a result of handling heavy loads, long hours of standing, squatting on the floor and uncomfortable seats.

Chemical hazards 8.3% come about as a result of use of chemicals, and fumes from recycled chemical tins.

Table 4.8: Types of Hazards Exposures from the Work Environment

Nature of Hazards	Number of responses	% of the total
Mechanical Hazards	30	50
Physical Hazards	15	25
Chemical Hazards	5	8.3
Ergonomic/Psychosocial Hazards	10	16.7
Total	60	100.0

Source: Field Data (2008)

4.3.2. Physical Layout of the Workplace

The findings presented in Table 4.9 indicate the physical layout features that contribute to exposure to various hazards for workers in the metalwork cluster at Kamukunji. A majority of the respondents 58.3% reported that their premises lack adequate working

spaces. This therefore leaves the workers exposed to accidents. Other reported physical features of the work stations include: machine noise 15.0%, slippery surfaces/tripping hazards 11.7%; and risk of falling objects 15.0%. The findings hence indicate that the Kamukunji *Jua Kali* metal work cluster is characterised by congested workshops that leave the workers exposed to various hazards.

Table 4.9: Physical Layout Features of the Workplaces

Physical Layout Features	Number of responses	% of the total
Inadequate working Space	35	58.3
Machine Noise	9	15.0
Slippery surfaces/tripping hazards	7	11.7
Risk of falling objects	9	15.0
Total	60	100.0

Source: Field Data (2008)

4.3.3. Ergonomic or Psycho-social Exposure

Congestion at the workplaces leaves the workers further exposed to various ergonomic hazards. The findings presented in Table 4.10 below indicate that most of the metal workers work while squatting and bending on the floor 33.3%; work for long hours while standing 16.0%; and handling heavy loads 16.0%. It was further reported that the shades do not have resting areas. Workers use stools which they reckon were uncomfortable. Such awkward work positions (such as bending, squatting and standing for long hours) are common, with poorly designed stools and benches leading to musculoskeletal problems due to constant neck and low back flexion.

Table 4.10: Ergonomic or Psycho-social Exposure

Features	Number of responses	% of the total
Handling of Heavy loads	10	16.7
Repetitive movements	6	10.0
Work squatting and bending on the floor	20	33.3
Long hours of standing	10	16.7
Isolated work	6	10.0
Rapid pace of work	8	13.3
Total	60	100.0

Source: Field Data (2008)

4.3.4. Exposure to Chemicals

The findings presented in Table 4.11 indicate various forms of chemical exposures facing the metal workers within Kamukunji metalwork cluster. In a number of cases raw materials comprise of chemical containers which are recycled for use by the artisans in production of various wares. Worse still, the containers are unlabelled and the chemical waste from these containers and fumes do cause harm to some of the workers, the environment and other neighbouring workers. Despite the relatively high level of chemical use and exposure, the study established there was an extremely low use of Personal Protective Equipment (PPE). Enhancing coverage of PPE may be difficult outdoor unless well regulated. A more appropriate control strategy would be to focus on the work site design and technologies used and identify inbuilt design features that will enhance safety so that these are left to individual implementation.

Table 4.11: Pre-disposing Factors to Chemical Exposure

Pre-disposing Features	Number of responses	% of the total
Use of chemicals	21	35.0
Unlabeled chemical containers	11	18.3
Exposed chemicals	16	26.7
Exposure to fumes	9	15.0
Chemicals stored in the open	3	5.0
Total	60	100.0

Source: Field Data (2008)

Other constraints commonly observed by the interviewer are as follows;

Hygiene facilities (toilets, water, drainage, disposal of waste) are not available ‘across the sector, indicating potential for improvement of these facilities at a collective level.

Noise, dust and heat problem in workplaces are noted across the sector to spill into neighbouring work places, affecting workers who are not exposed to these problems through their own work. This indicates a need not only to control these problems at source, but to ensure better workplace sitting and pollution control so that the number of exposed workers is limited.

Premises are very makeshift, and most workers are exposed to all types of weather. For those working in proper buildings, the workplaces are not designed to be used as a workplace and often do not have adequate facilities. Workplaces are poorly lit and poorly ventilated.

4.4. Work-related Injuries Experienced by Metalworkers

The second research question for the study had sought to identify the number of accidental injuries caused by the nature of work performed by artisans within the Kamukunji metalwork cluster.

4.4.1. Nature of Injuries Reported by Metal workers

The findings presented in Table 4.12 indicate various forms of injuries as reported by the sampled metal workers. The findings indicate that the commonly reported forms of injuries include broken bones and fractures 33.3%; burns/scalds and shock 21.7%; muscle strains/dislocations 16.7%, toxic poisoning 5.0% and other superficial injuries. Foreign bodies in eyes were commonly reported by workers such as gem cutters and grinders, yet few were wearing eye protection gear. Hazardous chemical use has been associated with respiratory problems, while exposure to organic dusts has been associated with frequent headaches, respiratory disorders, skin irritation, and burns from bleaching and dyeing. The rate of accidents for the metalworkers remains high because their work environment is still unregulated. Common work-related accidents were burns from the spillage of acids or from fire and splashes of melted metals and minor cuts from sharp hand tools.

Table 4.12: Nature of Injuries Reported by Metalwork workers Artisans

Nature of Injury	Number of responses	% of the total
Broken bones/Fractures	20	33.3
Eye injuries	5	8.3
Other superficial injuries	6	10
Muscle strains/dislocations	10	16.7
Burns/scalds and shock	13	21.7
Toxic poisoning	3	5.0
Others	3	5.0
Total	60	100.0

Source: Field Data (2008)

4.4.2. Causes of Injuries Reported by Metalworkers

Table 4.13 below presents findings on various causes of injuries suffered by metal workers at Kamukunji *Jua Kali* cluster. The findings indicate that the causes of injury are mainly mechanical in nature. They included being hit by falling objects 33.3%; stepping on striking objects 10.0%; being caught in between objects 16.7%; inhaling harmful substances 21.7%; tripping and falling within the workshops 8.3%; heat and shocks 5.0%; among other causes. The findings indicate that the causes of injuries can be easily managed and contained if the workers are adequately informed on occupational safety and how to avoid various injuries at the workplace. For example, provision of information on the appropriate protective wear against each type of injury would greatly enhance their preparedness levels towards such injuries at the workplace.

Table 4.13: Causes of Injury Reported by Metalworkers

Cause of Injury	Number of responses	% of the total
Fall of person	5	8.3
Struck by falling object	20	33.3
Stepping on striking object	6	10
Caught in between objects	10	16.7
Harmful substances	13	21.7
Heat/shock	3	5.0
Others	3	5.0
Total	60	100.0

Source: Field Data (2008)

4.4.3. Effects of Injuries Reported by Metalworkers

The field research had sought to enquire whether the effects of injuries sustained have had temporary or permanent effects on the workers, and if they diminish their abilities to perform certain tasks. The findings presented in Table 4.14 indicate that although most of the reported injuries had no permanent effects 53.3%, it is evident that 21.7% of the sample respondents sustained permanent effects. Besides, the findings indicate that 8.3% of the sample respondents had to switch their jobs after the injuries sustained led to loss of ability to perform their initial jobs. Further inquiry established that none of the injuries was reported to the Worker’s Compensation Fund or Insurance and hence no cases have been compensated for. The findings therefore imply that injuries at the workplace can bring short-term, long-term, and permanent effects. The lack of a workers’ compensation scheme for the informal metalwork cluster underscores the need to inform the workers on issues relating to occupational health and safety at the workplaces.

Table 4.14: Effects of Injuries Reported by Metalworkers

Effects of Injury	Number of responses	% of the total
Permanent	13	21.7
Not Permanent	32	53.3
Same job ability	10	16.7
Inability to do the same job	5	8.3
Total	60	100.0

Source: Field Data (2008)

4.4.4. Health Issues and illnesses Reported by Metalworkers

The findings presented in Table 4.15 indicate various types of illnesses and health issues associated with the work-place. The findings indicate that the most common form of ill health is respiratory disorders 43.3%, particularly due to the open spaces in which they operate from. In addition, the workers suffer from skin diseases, eye strain, eye problems, stress and depression, and lower respiratory complications. Their overall vulnerability to ill health increases the possibility of developing long-term illness resulting from work conditions. Equally, hazardous and adverse working conditions compound and combine with poor health and living conditions. Many of the metal workers were reported to self-treat illness using over the counter drugs, including caffeine and analgesics. Such drugs were taken for work-related problems such as back, neck, limb and joint pain as well as eye strain and headache. Although many of the workers have suffered from eyesight problems arising from their exposure to hazards, eye testing and the purchase of eye glasses is considered expensive and beyond the financial reach of most of them.

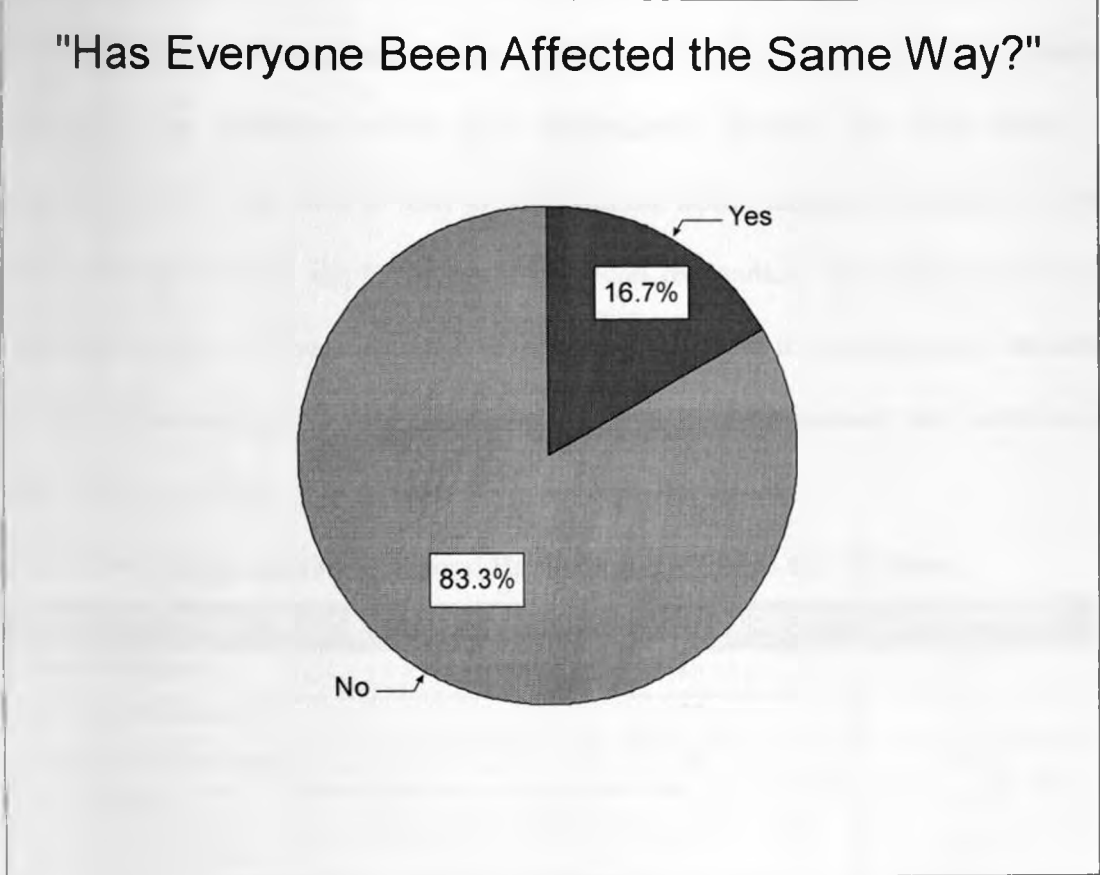
Table 4.15: Health Issues and Illnesses Reported by Metalworkers

Health Problems	Number of responses	% of the total
Upper respiratory disease (throat and mouth)	26	43.3
Others	11	18.3
Skin disease	3	5
Eye strain, eye problems	14	23.3
Stress and depression	3	5.0
Lower respiratory (Lungs and internal organs)	3	5.0
Total	60	100.0

Source: Field Data (2008)

The respondents were also asked whether or not other workers in their workplace had suffered from similar illnesses arising from workplace-related conditions. The findings presented in Figure 4.1 below indicate that a majority of the respondents 83.3% reported that each worker experiences unique type of illness or health-related complication from the other workers. This statistics could, however, be taken with caution since discussing other people’s ill-health is discouraged as health status is regarded as very personal. However, it can be regarded as an indicator of the prevalence of the respective health problem at the surveyed work sites. In general, it was observed that the respondents were reluctant to answer direct questions on illnesses and preferred questions on risks at the work place and their effects. These may have led to some under reporting of work related illnesses.

Figure 4.1: Multiplicity of Effects Arising from Injuries (N=60)



Source: Field Data (2008)

4.5. Impact of Occupational Hazards and Risks

The third research question had sought to determine the effects of various illnesses to the next of kin of the sample workers. Various indicators that were used to evaluate the impacts included: work output, work morale, treatment expenses, loss of customers, loss of employment, stagnation of business, and health conditions of the workers.

4.5.1. Impact of Occupational Hazards and Risks to the Workers

The findings presented in Table 4.16 indicate the impacts of occupational hazards and risks to the workers. The findings indicate that the respondents reported that occupational hazards and risks had adverse impact on them. Some of the adverse effects included low

work output 35.0%; lack of work morale 8.3%; and absenteeism from work 26.7%. Others included suffering from various health problems, coupled with huge treatment expenses. The findings indicate that occupational hazards and risks reduce the productivity levels as well as lead to deteriorating health amongst metalwork artisans. Such enormous effects imply the need for social recognition of occupational risks for informal workers in the metalwork cluster, with a view to planning and facilitating adequate interventions for their prevention and to adequately manage the health burdens they cause to workers.

Table 4.16: Impact of Occupational Hazards and Risks to the Workers

Impact of Hazards and Risks	Number of responses	% of the total
Low work output	21	35.0
Lack of work morale	11	18.3
Absenteeism from work	16	26.7
Health Problems	9	15.0
Treatment Expenses	3	5.0
Total	60	100.0

Source: Field Data (2008)

4.5.2. Impact of Occupational Hazards and Risks to Business

The findings presented in Table 4.17 below indicate the effects experienced by the metalwork businesses as a result of exposure of the workers to occupational hazards and risks. The findings indicate that a majority of the respondents 41.7 reported that their businesses stagnate during times that they experience health problems. This is because the affected workers are forced to address their health problems at home, since no medical facilities are provided by the employer and they also cannot afford to go to hospitals.

Table 4.17: Impact of Occupational Hazards and Risks to the Businesses

Impact of Hazards and Risks	Number of responses	% of the total
Stagnation of work	25	41.7
Reduction inflows of goods and services	20	33.3
Loss of customers	10	16.7
Loss of employment	5	8.3
Total	60	100.0

Source: Field Data (2008)

33.3% of the respondents reported reduction in flow of goods and services. In addition, 16.7% of the sample respondents reported that they lose customers as well. Under extreme conditions, some workers often lose their employment (8.3%), hence loss of income both to the worker and also to the business. The findings therefore indicate that the productivity and turnover levels of the metalwork businesses are adversely affected due to exposure of workers to occupational hazards and risks.

4.5.3. Impact of Occupational Hazards and Risks to the Family

The findings presented in Table 4.19 indicate the impacts experienced by the families of workers due to exposure to occupational hazards and risks at their work places. The findings indicate that a majority of the respondents 80.0% reported that the families experience a decline in income. Other effects include poor health of the affected family member and poor living conditions. The findings therefore imply that occupational hazards and risks have far-reaching implications for the workers' lives, both at the personal and socio-economic levels. Considering that most of the workers are male as shown in Table 4.1, the economic status of their families are bound to change completely especially if they come from male-headed households, where they are the household heads.

Table 4.18: Impact of Occupational Hazards and Risks to the Family

Impact of Hazards and Risks	Number of responses	% of the total
Low Income	48	80.0
Poor health	7	11.7
Poor living Conditions	5	8.3
Total	60	100.0

Source: Field Data (2008)

4.5.4 Impact of Occupational Hazards to the Employer

On the part of the employer the impact is not as much as the worker because when issues of absenteeism occur he is able to bring on board other workers. This is because there is nothing formal in terms of employing these workers and hence he can do without them to avoid additional expenses of health insurances or compensation.

Nevertheless he does compromise on quality of work and goods. This is because he has no time to train every time a worker leaves or gets sick. Hence he will be affected by issues like loss of customers and reduction in flow of goods and services. This can then result in stagnation of work or closure of business.

Therefore the impact of the occupational hazards on both the employer and employee are mutually exclusive and each cannot do without the other.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Kamukunji is a large Petty Commodity cluster which is realizing only a few of the potential benefits of clustering. The cluster is well known and therefore provides access to local markets. Some suppliers are located within the cluster, though it is not clear whether these are new migrants or are the result of specialization among existing firms/workshops. There appear to be few technological spillovers in Kamukunji because of lack of support especially from the government of Kenya. Serious problems such as standardization in production are yet to be tackled, especially in production of agricultural tools and equipment.

Economies of scale on the other hand are not being realized as producers continue to operate in small sizes as there are little working spaces thus causing congestion. Kamukunji has a large pool of labour available, but it is evident that most start their own workshops rather than join the existing enterprises. This is evident from the results where the majorities are business owners with the only existing employees being on training and after training a good number of them start their own workshops. Therefore joint action is totally missing. To strengthen this, there is need to revive and operationalize a Kamukunji Jua Kali Association. The association will be instrumental in achieving the aim of bringing the artisans together so they can be reached by government initiatives to make them meet their own objectives. The association can also help in improving the standards of the Kamukunji working environment through having health care centers and looking into more viable means of protecting the sector members from health hazards.

In terms of levels of injury and illness, the rates reported in this study signify the presence of occupational risks and a negative health burden that is not factored into national assessments of and programs in occupational health and safety. Hence there is a strong case to make all work related fatalities reported to Occupational Safety and Health (OSH) to help raise the profile of occupational health in the sector.

For coverage from the Workers' Compensation Fund to be viable, it is suggested that the sector be linked to government and local insurance industry. To qualify for government and other credit schemes, proof of subscription to Worker's Compensation Fund should be shown and assistance be given to ensuring such coverage. In addition, given the lack of accurate data and the need for a simplified system of coverage, it is suggested that a flat annual rate be levied per worker.

5.2 Recommendations Based on the Survey

In order to reduce work-related risks, the study proposes that the greater share of the health burden of occupational risks should be addressed by improving hygiene, ergonomics, work organization and hand tools safety.

To overcome these discrepancies, a catalyst is needed to start up a process of change. This catalytic role can be taken up by different people and organizations. Local governments need to ensure that basic Occupational Health and Safety standards are promoted to help informal enterprises fulfil their economic potential and create sustainable business.

There was need for change of attitude by the workers towards occupational health and safety. It became clear that most of them had some insight into the occupational hazards of their workplaces but generally lacked thorough factual Occupational Health and Safety knowledge. The lack of knowledge often resulted in incorrect and even dangerous interpretations of what behaviour should be adhered to.

Sharing knowledge on good Occupational Health and Safety practices needed to be enhanced. The Directorate of Occupational Health and Safety services need to play an advisory role in addition to enforcement of the law in order to enhance voluntarily participation by the Jua Kali workers in applying solutions

The issue of improved technology for the sector especially in the safety aspects should be introduced. In addition worksite layout should include an adequate ratio of hygiene facilities. Allocation of sites should consider clustering of similar work processes together. Work site design should incorporate ergonomic features for work benches, platforms and seats as well as passage ways, storage facilities and emergency ways, storage facilities and emergency exits.

The specific problem of chemical exposures required a focused information programme on safe handling of chemicals, their risks and health effects. Simplified Safety data sheets for the most common chemicals in use produced in the English and Kiswahili languages with appropriate advice on risk reduction, first aid and health impacts should be made available to all workers.

There was need to come up with an effective means of collecting data on occupational accidents and diseases in order to ascertain their impacts and improve the workplace conditions. This can be done through Registration and licensing of these businesses. The licensing system provides an opportunity for communicating information on Occupational Health and compensation to informal sector workers.

There is need to create an all-inclusive Occupation Injury and Health Insurance Scheme for workers in this sector to combat the impact of occupational accidents and diseases.

The study recommends a need for training at all levels not only for employers only, but also employees in Occupational Health and Safety issues at the workplace. This will help curb accidents and risks involved in the nature of work.

Further Research

The pace of technological change has been quite rapid within the informal sector and perhaps nowhere more so than in the metal workers sector . The workers learn how to design and make yet another item for the metal work trade that hitherto was only made in the Industrial Area or was imported. There has been no study of the new ground won on the frontier, but it would certainly be valuable to have status report on this (Mihyo, 1994:9' King Abuodha, 1995).

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APPENDIX I: QUESTIONNAIRE USED IN THE SURVEY

OCCUPATIONAL HAZARDS IN THE KAMUKUNJI METAL WORK SECTOR

To be administered to each worker involved in the metal work sector.

We are doing a health survey and we would like to ask you some questions. The questions will take about 20 minutes to answer. We do not ask you to give your name, so your answers will be confidential.

Interviewee _____ Date _____ Te; Contact _____

SECTION A: GENERAL INFORMATION

PERSONAL DATA:

Please tick the appropriate space on the questionnaire.

1. Age: bracket

Below 20 years ☐

21-29 years ☐

30-39 years ☐

40-49 years ☐

Above 50 years ☐

2. Gender

Male ☐

Female ☐

3. Highest education level completed

Primary standard ☐

Secondary ☐

4. When the business started? _____

5. Formality status? _____

SECTION B: EMPLOYMENT INFORMATION

6. What is employment status?

Employer/Business Owner ☐

Paid Permanent ☐

Paid casual ☐

Trainees ☐

7. What is respondent's occupational skill level?

Skilled ☐

Semi skilled ☐

Unskilled ☐

8. Nature of wares produced?

Home appliances ☐

Agricultural tools ☐

Repair and services ☐

Construction tools ☐

SECTION C: WORKPLACE EXPOSURE

a) Have you had any health problems?

Yes ☐

No ☐

b) How has your work place environment contributed to the health problems you are experiencing?

Mechanical hazards ☐

Physical hazards ☐

Chemical hazards ☐

Ergonomic/Psychosocial hazards ☐

Personal Protective Equipment/Controls ☐

Any other (please specify) _____

SECTION D: INJURY AND ILLNESS

The next 6 questions apply to injury

1. Have you suffered any injury as a result of your work?

Yes ☐

No ☐

2. What was the nature of the injury?

3. What was the cause of the injury?

4. Does the injury still interfere with your ability to work?

Yes ☐

No ☐

If yes, how?

5. Was the injury reported to the worker compensation fund?

Yes ☐

No ☐

6. Did you receive compensation for the injury?

Yes ☐

No ☐

I am now going to ask you about health problems or illness due to work

a) Have you ever suffered any other health problem or illness?

Yes ☐

No ☐

b) What was the nature of the health problem or illness?

c) According to you was it work related?

Yes ☐

No ☐

a) Has anyone else in your work place been affected in the same way?

Yes ☐

No ☐

If yes, how many?

SECTION E.: IMPACT OF OCCUPATIONAL HAZARDS AND RISKS ON:

a) You as the worker?

b) Your work

c) Your family?

d) Others?

2) How best do you think the impact can be minimized?

By your employer

By the government

SECTION F: OBSERVATION CHECKLIST

Item	Existence/Compliance Yes/No	Remarks/Comments
Registration certificates/Licenses		
Premises by DOHSS		
Establishment –NEMA		
Single Business Permit-Nairobi City Council		
Public health		
Safety health and environment		
Lighting and ventilation		
Designs-walkways, factory, lifts		
Provision of clean water, changing room/shower, sanitary facilities		
First Aid facilities-existence and accessibility		
Availability and use of personal protection equipment and clothing		
Safety in working area-furniture arrangement, electric wiring, lighting, ergonomics		
Display of safety instructions		
Storage of hazardous items		
Fork lifts, loading or other operating equipment-existence, adequacy, condition and usability		
Training in OSH		
Disposal of Waste		
Drainage		
Policy guidelines and procedures		
Facilities for disposal-types, location/sitting, conditions and use		
Partnership arrangement with service providers e.g. garbage disposal firms		
Other specify		

SECTION G: FACTORS AFFECTING COMPLIANCE WITH OSH LAWS AND REGULATIONS

To be answered by key informants in the metal work sector		
Registration certificates/Licenses		
Please rate the following issues (by ticking the relevant box (in items of the degree to which they AFFECT COMPLIANCE with OSH laws and regulations. Tick Yes/No		
Key issues	Rating (Tick as appropriate)	
	Yes	No
Laws and regulations inadequate		
Laws and regulations inexpensive to comply with		
Does not make a difference to comply or not		
It is cheaper not to comply		
Nobody has asked us to comply		
DOHSS officials are corrupt		
Inspections irregular		
Do you agree with DOHSS		
Do you have adequate OSH measures in place		
Other (specify)		

APPENDIX II: INTERVIEW SCHEDULE FOR KEY INFORMANTS

Introduction

1) Name _____

Ownership _____

When did business start? _____

Activities engaged in

2) Operational challenges _____

a) Regulations _____

b) Relationship with employees/customers _____

c) Occupational safety and health _____

d) Environmental management _____

e) Sustainability _____

3) What has been your role in addressing these challenges?

Have you experienced any problems while addressing these challenges? If yes explain

What according to you would help make the informal sector more ethical in its operations?

APPENDIX III: SURVEY PHOTOGRAPHS

Picture 1: Jua kali workshop along the road in Kamukunji



Picture 2: Workshop with poor conditions, people working without protection gears



Picture 3: A man wearing welding glasses



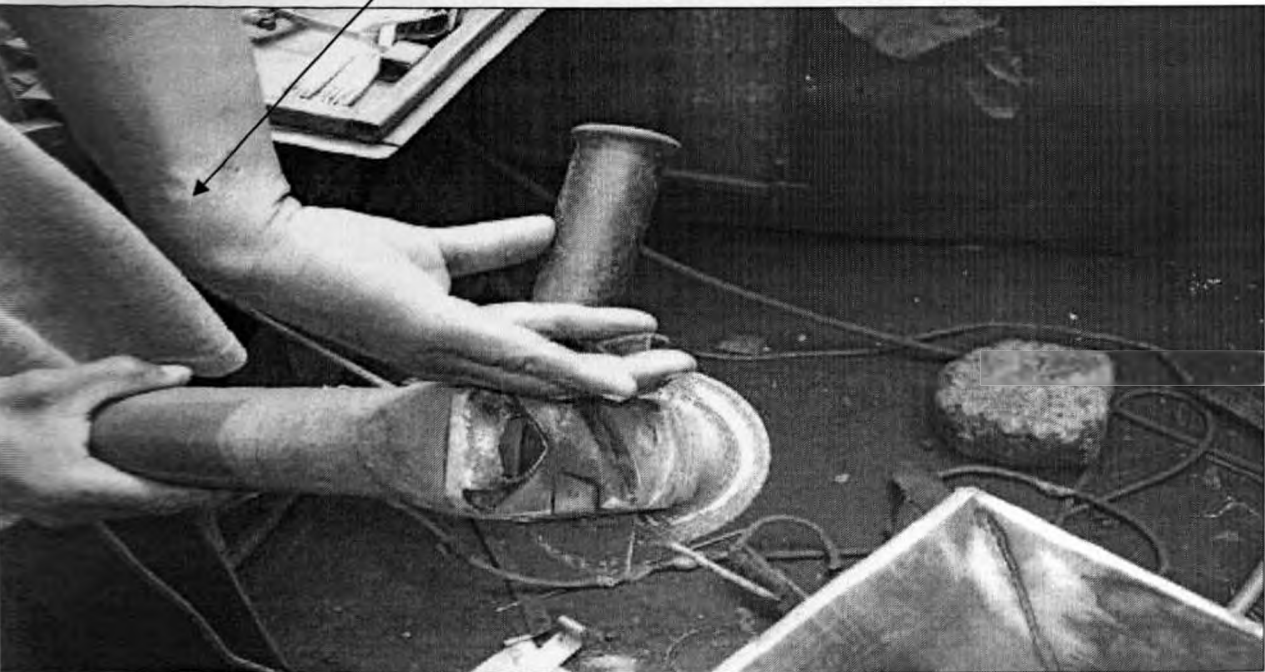
Picture 4: Men hitting a hot metal rod without protection gears



Picture 5: A heap of recycled tins



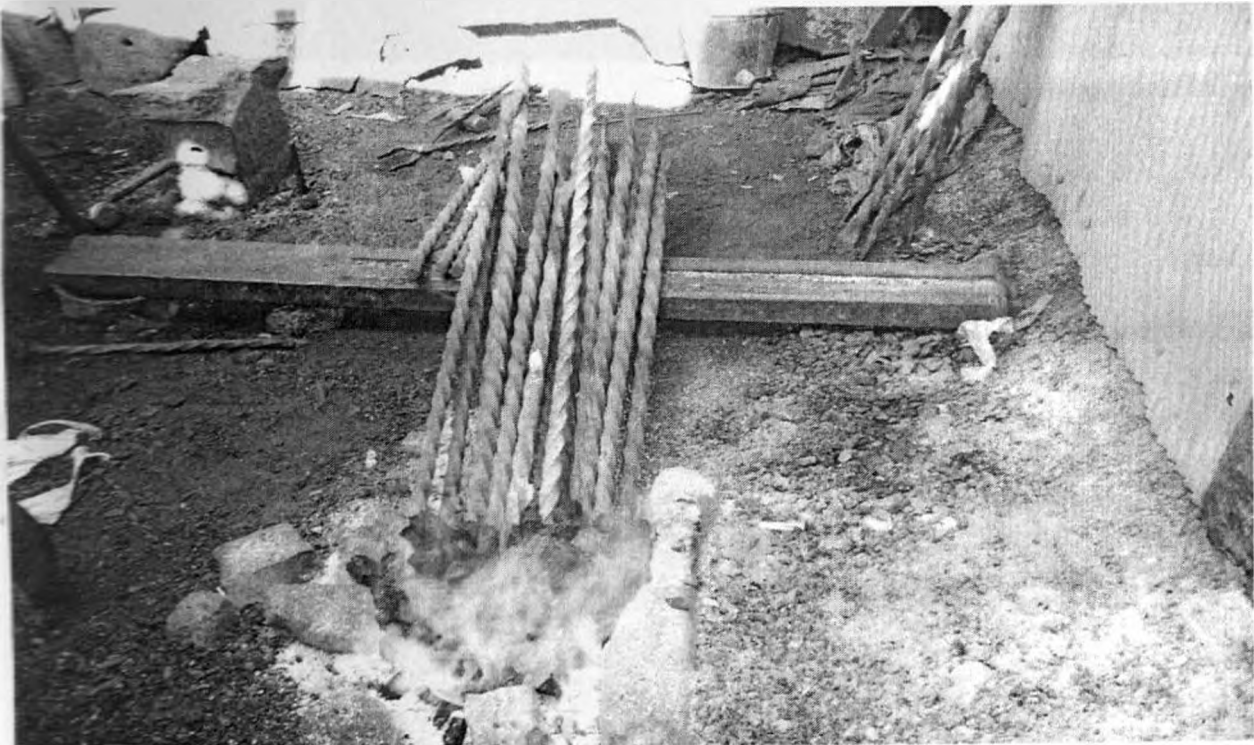
Picture 6: A man shows his scar from the past injury incurred on his arm



Picture 7: A man sitting in a hazard prone environment



Picture 8 An open fire left unattended



Picture 9: Kamukunji Jua Kali Association Office



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