

**STUDY ON FLEET SAFETY IN SELECTED BEVERAGE
INDUSTRIES IN NAIROBI COUNTY, KENYA**

GIKUNJU MILLICENT WANJIRU

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Gikunju Millicent Wanjiru

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DECLARATION

This thesis is my original work and has not been submitted for a degree in any other University.

Signature Date

Millicent Wanjiru Gikunju

This thesis has been submitted for examination with our approval as University supervisors

Signature..... Date

Mr. Charles Mburu

JKUAT, Kenya

Signature Date

Prof. Erastus Gatebe

KIRDI, Kenya

Signature Date

Dr. Benson Karanja

JKUAT, Kenya

DEDICATION

I dedicate this work to my dear friend and husband John, my lovely daughter Amy, my dear parents Mr. & Mrs. Gikunju and my siblings for their encouragement and unwavering support during the studying and research period.

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ACRONYMS

CSR	Corporate Social Responsibility
DOSHS	Directorate of Occupational Safety and Health services
FLTs	Fork Lift Trucks
GDP	Gross Domestic Product
GOK	Government of Kenya
KAM	Kenya Association of Manufacturers
KSHS	Kenya Shillings
NTSA	National Transport & Safety Authority
OSH	Occupational Safety & Health
RTI/A	Road Traffic Incidents/Accidents
SPSS	Statistical Package for Social Scientist
UK	United Kingdom
UN	United Nations
USD	United States Dollar
WHO	World Health Organization

DEFINATION OF TERMS

- Accident:** Any unplanned event with negative consequences
- Major accident:** An accident that results to injury and impacts on the road worthiness of the vehicle or fleet
- Minor accident:** An accident that doesn't result to injury or damage (road worthiness not affected)
- Food and Beverage sector:** The largest sector of KAM comprising of 181 members (constitutes 24% of total Kenya Association of Manufacturers (KAM) membership.
- Drivers:** A person who drives a motorized vehicle
- Fleet:** A group of vehicles, transportation trucks in this context
- Fleet Safety programs:** Initiatives that are aimed at improving the fleet safety

ABSTRACT

Safety is a key component in any organization and the safety culture of an organization determines its development objectives and its profitability. According to the World Health Organization, it is estimated that road traffic accidents cause 1.3million deaths and 20-50 million disabilities worldwide with an estimated cost of US\$500 billion a year. Recent studies from Kenya's National Transport and Safety Authority indicate that road related accidents have a huge impact on the social and economic costs. The report further reveals an estimated annual cost of 14 billion Kenya shillings, (approximately 160M USD) due to road traffic injuries to the country's economy, an equivalent of 5% of the country's GDP. This research sought to find out how fleet safety is being implemented in the beverage industries within the Nairobi County. The food and beverage industry in Kenya comprises of small unit organizations that are family owned to large multinational companies like Coca-Cola, Kenya Breweries limited among others which add value to the agricultural output and provide linkages to the other sectors through transportation of goods and other commodities. These activities suggest that the industry has a lot of potential in building the economy. According to a report by investment Kenya in 2013, the fleet safety management which falls under the Transport and Infrastructure sector contributes about 11% of Kenya's GDP therefore becomes a key aspect of the industry as it facilitates this growth. This study focused on five key beverage industries within the Nairobi County adopting a cross sectional survey design with an exposed target population of 600 consisting of drivers, turn boys, forklift operators and the management. Simple random sampling was used with questionnaires being adopted for interviews and observation. Results showed an increasing trend of accidents across the organizations over the past five years. These accidents were majorly attributed to driver fatigue 30(68.2%), high speed 23(52.3%) and aggressive driving behavior 17(38.6%). The long working hours for drivers as well as lack of a clear policy on the driving duration pointed to the driver fatigue as the leading cause of accidents. The obtained data further revealed that majority of the drivers (78%) were aware that they have a responsibility for their safety and also for other users. According to the drivers, mobile phone use while driving was a major cause of distraction leading to accidents (78%). This research reveals that fatigue and use of mobile phones on the road while driving are the leading causes of accidents on the road. According to this research, Fleet Safety policies are in place within the organizations but there are no clear guidelines on the working hours for drivers in a 24 hours working day and how that should be enforced. Despite a good training and awareness record from the sampled organizations, there's need to review the training plans to include real issues coupled with other safety programs to ensure an effective fleet safety management which is currently lacking.. Therefore, the study calls for management commitment and support in enforcing the rules related to 'do not use mobile phones' while on the wheel and review the working hours to include mandatory breaks for long journeys. The industries should work with the NTSA to ensure full implementation of these rules which could mean introduction of a ticketing or checking system for all truck drivers on the roads to confirm that they are taking necessary breaks and complying with other rules set aside by the authorities.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

1.1.1 Overview of fleet safety

According to the Kenya Association of Manufacturers (KAM, 2015), Kenya's food and beverage industry is the largest sector contributing 21% of the country's GDP. It comprises of 181 members, who constitute 24 per cent of total Kenya Association of Manufacturers (KAM) membership. The sector contributes towards employment, revenue collection by government and the export of products to earn foreign exchange. It is also an industry that has linkages with other sectors and industries such as transportation, glass making and advertising, thereby making it the most interactive and hence the most vulnerable sector.

Fleet management is a function that allows organizations that rely on transportation in their business to minimize the risks associated with vehicle investment, improving efficiency, productivity and optimizing their overall transportation costs while ensuring compliance to the applicable legal and other requirements. Fleet safety programs establishes the policies and procedures that are required to ensure a safe work environment for the workers.

According to the World Health Organization (WHO), one of the world's leading causes of death and disability is road traffic related injuries which accounts for over 1.25 million deaths per year. The most affected age group is between 15-29 years with three quarters of those affected being male (WHO, 2015)

The World health Organization reports that although the low-and middle-income

countries own less than half the number of vehicles world wide,over 90% of road traffic accidents occur there with Kenya falling within this category (WHO,2015). In Kenya approximately 14 Billion Kshs. is attributed to road traffic incidents which accounts to about 5% of the country's Gross Domestic Product. (NTSA,2016)

In the United Kingdom, it is reported that workplace related transport accidents in the food and drink sector are the second highest cause of fatalities accounting to about 25% of all fatal accidents (HSE, 2010). The report further reveals that in a period of about 10 years from April 2000 to March 2010, 11 workers were fatally injured directly by workplace transport as a result of being crushed by a vehicle. A further 10 workers were fatally injured through falls from stationary vehicles or being struck by objects falling from the vehicle (Sulzer-Azaroff et al, 2000).

A sound fleet safety management program is therefore paramount in any organization and some of the reasons includes saving organization money. Road traffic accidents and resultant consequences can have a serious impact on any economy and program delivery.

Having a fleet safety policy is a legal requirement in most organizations around the world, with the management being held accountable for any omissions on their part or on part of their workers; this however isn't the case in the Kenyan set up as most of the perpetrators go unpunished. The vehicle fleet is probably the most prominent symbol of the organization especially if it is branded, thus driver behavior on the road and vehicle use/misuse will determine how an organization is perceived thus impacting on its reputation.(Sulzer-Azaroff et al, 2000).

1.2 Problem statement

The cost associated with fleet accidents is enormous and have an impact to the national economy including loss of life. In Kenya, NTSA attributes the road Traffic accident costs to be approximately Ksh.14 Billion,(NTSA, 2015). An increase in fleet accidents in the industries particularly the food and beverage sector has a negative impact on the economy due to the volumes and numbers of persons and properties involved. Most previous studies in fleet safety in Kenya have addressed general road safety, with little or no studies on the implementation and impact on the specific sectors. The subsector has been recording some of the highest accidents in the country (NTSA, 2015).

Lack of research specific to the sectors make it difficult for developing intervention and prevention mechanisms necessary to prevent loss associated with fleet accidents. This research aimed at finding out what organizations in the beverage industries are doing to reduce the occupational and health safety concerns associated with fleet management and its impact on the industry.

1.3 Justification of the Study

Fleet accidents cause emotional, physical and economic harm. There is a societal, business and legal imperative as to why this impact should be reduced. The cost of doing business has been blamed for low expansion of the industry and hence the need to address the many incapacitation of the fleet workers who are being made unproductive due to injuries and sometimes loss of life.

In order to address the cause of fleet accident, proper data need to be available and little exist to date.

This study was based in Nairobi County where 80-90% of the industries are

situated, with a focus on the food and beverage industry which is the largest sector constituting of 24 per cent of total Kenya Association of Manufacturers (KAM) membership. It contributes towards employment, revenue collection by government and the export of products to earn foreign exchange. It is also an industry that has linkages with other sectors and industries such as transportation, glass making and advertising, thereby making it the most interactive and hence the most vulnerable sector.

The study has endeavored in identifying the underlying fleet safety concerns in the industries as past research has addressed general road safety with little or no studies relating to the specific sectors. The information will further assist organizations and other stakeholders in addressing the challenges and highlight on the benefits of implementing a sound fleet safety program.

Consequently, this will help reduce the number of fleet accidents hence saving lives that would have been lost through recklessness, safety violations or even lack of enlightenment on the best fleet and road safety practices. The facts presented in this study will be significant in assisting the management understand better what ails the organizations in terms of fleet safety management. Hence employing proper planning for driver trainings and sensitization, understand the right way to address it, ensure proper checks are put in place to mitigate the risks.

This will in turn cultivate a culture of unconditional fleet safety within organizations and hence overall improved performance. Kenya development blue print (Vision, 2030) attaches the health and safety of the workers as a priority and saving the cost of doing business. This work intends to fill the gaps that exist in addressing the challenges in fleet management thus cutting associated cost.

1.4 Study Hypotheses

1.4.1. Null Hypothesis

The control measures being implemented by the management are not adequate in addressing fleet safety in the selected beverage industries in Nairobi County, Kenya.

1.5 Objectives of the Study

1.5.1 Main objective:

To study the fleet safety management in the beverage industries, within Nairobi County, Kenya.

1.5.2 Specific objectives

1. To establish the average number of work related fleet accidents recorded and their causes within the beverage sector in Nairobi, Kenya in the last five years
2. To determine the level of awareness and driver behaviour on fleet safety
3. To identify the control measures currently being implemented to address fleet safety management.

1.5.3 Research Questions

1. What is the average number of work related fleet accidents and their causes that have been recorded in the last 5 years within the organization?
2. What is the drivers' level of awareness and behavior in regards to fleet safety?
3. What is/are the control measures being implemented by management to address fleet safety concerns?

1.6 Scope of the Study

The study was based in Nairobi County where five beverage industries were purposefully selected, data collected and analyzed to represent the food and the beverage sector. The research involved perusal of available records related to the fleet Safety within the organizations as well as interviews with the Safety and Health representatives, committee members, drivers, turnboys and forklift operators among other stakeholders so as to obtain information related to fleet safety implementation in the Kenyan beverage sector.

The casual employee's data was excluded to avoid bias, with the permanent and contract employee's feedback being analyzed. The study took into account the opinions of permanent and contractual employees due to the legally binding agreements they have with the respective organizations, as casual employee opinions were considered to be unreliable. The county was selected as it hosts over 60% of the beverage plants in the country.

1.7 Study Limitations

Although the objectives of this research were achieved, it was not without some challenges.

First, the data collection exercise from the various organizations on the number of accidents recorded over the past five years was not well perceived by the interviewees until confidentiality was guaranteed.

Secondly the sample population for this study comprised of drivers, turn boys and forklift operators who were available on the particular days and this sample

is a very small population of the entire driver's population within the county and the country at large.

1.8 Conceptual Framework

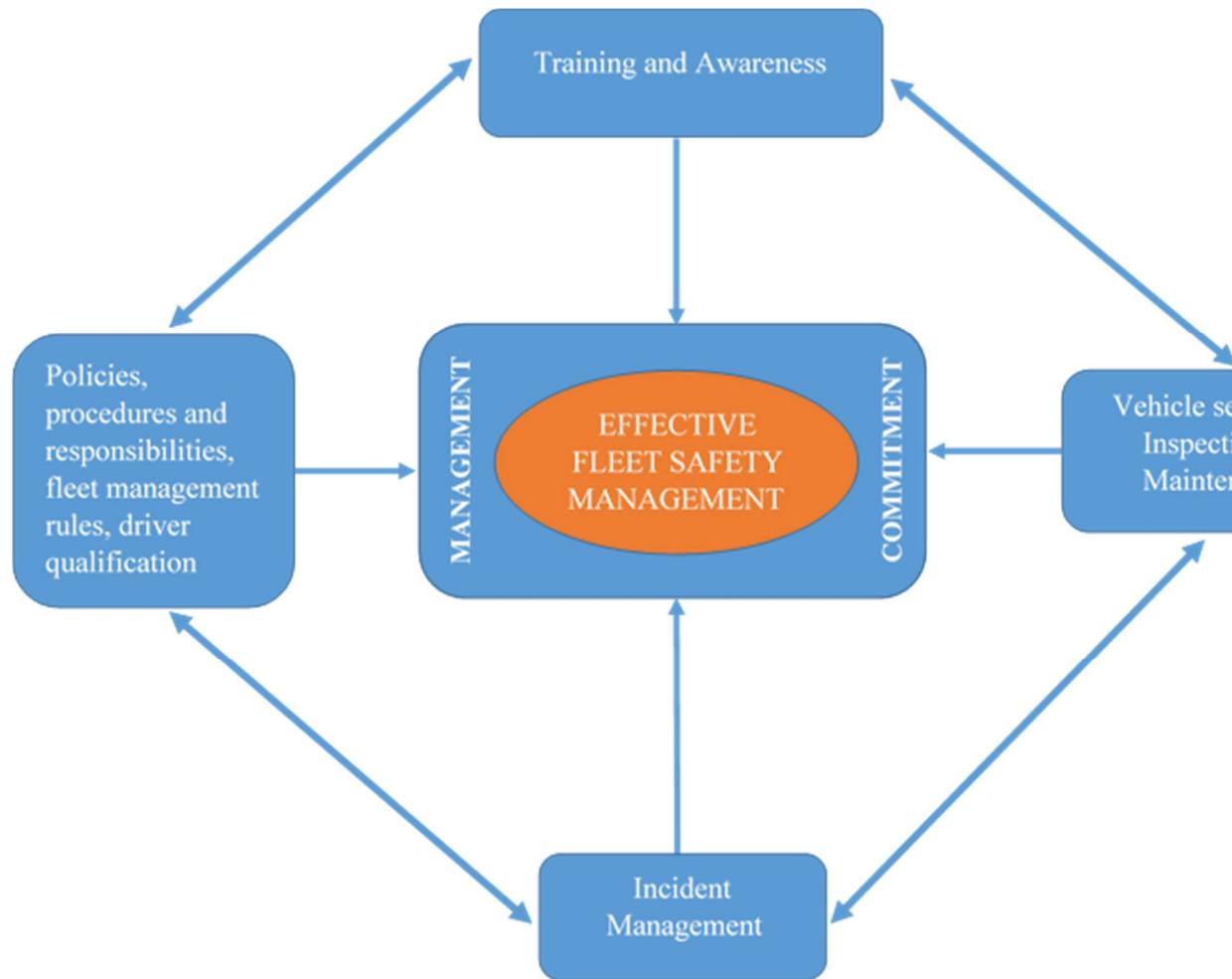


Figure 1.0: Conceptual Framework

For an effective fleet management system there should be clear laid down policies, rules and procedures, driver recruitment should be based on qualifications set out by an organization. A clear training and awareness plan

covering important topics related to the driving occupation should be in place. A culture of reporting and investigation of incidents should be cultivated with proper maintenance of the vehicles with all the programs fully supported by the top management.

CHAPTER TWO

LITERATURE REVIEW

2.1 Global Road Safety Position

According to the World Health Organization, there were over 1.3 million road traffic fatalities reported in the year 2004. This number is estimated to reach 2.4 million by 2030 mainly due to an increase in the number of vehicles on the roads as well as economic growth in low and middle income countries. This would place road traffic as the fifth cause of death up from the current 9th position (WHO, 2015).

Developing countries where rapid motorization is expected over the period to 2020 and beyond are therefore very likely to experience increasing road crashes and rising levels of fatalities and injuries. Motorists in such countries face increasing risks on the roads, unless appropriate and drastic measures are put in place. As the levels of motorization rise, pedestrians, cyclists and motor cyclists are also to be adversely affected due to their vulnerability on the roads. The Global status report by WHO indicates that out of 182 countries which is an equivalent of almost 99% of the world's population, only 28 of them, about 7% of the world population have well spelt road safety laws on drinking and driving, speeding, use of seatbelts and motorcycle helmets and child restraints. The road traffic accident casualties make up to about 75% of the economically productive age mainly males (WHO, 2015).

2.2 Road safety status in Kenya

WHO reports about 8,400 road crash related deaths per year on Kenyan roads (WHO 2013). According to past research road transport system is the main form

of inland transportation carrying more than 95% of passenger traffic (Odero et al, 2003). According to the Kenya Traffic Police Department there were 2893 road traffic deaths in 2007 with the trends data showing a steady increase over the last forty years.

The report further reveals that more than three-quarters of those killed on the Kenyan roads are males, with 75% being of economically productive age. Approximately half are children or young adults, with fifty-seven percent being vulnerable road users i.e. pedestrians, cyclists and motorcyclists. Speed has been identified as a major killer on Kenyan roads as well as the lack of use of safety equipment such as helmets, seat-belts and child restraints. The numbers of reported accidents have shown increasing trends from 10,300 in 1990 to 17,400 in 2009, an almost double in a period of twenty years. The annual economic cost of road traffic accidents is estimated at about 5% of the country's Gross National Product (Odero et al, 2003).

Fleet safety has grown in prominence in recent years, as the scale of the problem has emerged. This includes people involved in crashes whilst working by the roadside, or driving as part of their work, either in their own vehicle or a vehicle provided by their employer – all of which have a potential impact on organizations.

According to Whitelegg (2012), there are a range of societal, business, legal and cost reasons why organizations should focus on fleet safety. Typically, senior managers involved in marketing and branding are influenced by the CSR and business benefits, compliance and legal managers take notice of the legal requirements and accountants/business managers are most likely to be persuaded by strong financial arguments.

Overall, there are some strong legal, societal, business, and financial arguments

in favour of taking proactive steps to improve fleet or occupational road safety. The benefits of improving fleet safety include: a reduction in personal injury, at work and leisure, increased awareness of 'on the road' risks, improved safety and reductions in potential vehicle collisions. Financial benefits include: reductions in vehicle downtime and repair costs and higher productivity of employees through reductions in injury absence.

The purpose of the study was to evaluate the control measures that are currently implemented in regards to road safety and establish ways in which fleet/road related incidents can be reduced and hence sound fleet Safety in the Kenyan beverage sector in the Nairobi county and other industries at large.

Each year over 200 people in food and drink factories in the UK are struck by fork lift trucks (FLT) and other vehicles, frequently resulting in serious injuries. The main causes of injury are: Struck by vehicle (except FLT): 31%, Struck by FLT: 26%, Falls from vehicles: 22%, Trapped between vehicle and wall: 6%, Trapped by overturning FLT; 6% and Trapped between two vehicles: 5%. Where a person was struck by a FLT, it was reversing in 28% of cases (21% of cases for other vehicles (Sulzer-Azaroff et al, 2000)).

2.2.1 Factors leading to road accidents in Kenyan roads

Over the years, the number of road deaths and injuries on Kenyan roads has been on the rise. It was estimated that road crashes cost the Kenyan economy Kshs. 100 Million or 1.7 per cent of the GDP in 1981, by 1997, it was estimated that, 26 per cent to 52 per cent of the road transport sector earnings were lost due to road crashes. Today, the annual average cost of road crashes to Kenya's economy is Kshs. 14 billion or 5 per cent of the GDP. This far exceeds the annual average cost of road crashes to the economies of Third World countries, which oscillates between 1 -2 per cent of their GDP (GOK, 2009).

It is estimated that slightly over 1.2 million people die annually across the world from road accidents while 20-50 million people sustain injuries. The youths from the low and middle income countries of the world are the most affected. Human and environmental errors are some of the causes of road accidents globally. Kenyan roads claim about 10 lives every day and the trend seem to be surging upwards with the entry of motorcycles into the passenger transport sector. Individuals, families and institutions experience socio-economic, physical and psychological problems. Preventive and adoption of tried and successful measures of reducing road accidents and injuries may help solve the problem.

Road transport crashes ranks high among the greatest development challenges currently facing many countries of the world. The frequency, magnitude and impact of global road carnage has a huge impact on the economy. During the 1990s, the Asian and Pacific region alone registered over 2 million annual road accident fatalities and about 17 million road accident-induced physical disabilities. It is estimated that the global economy loses up to US \$ 500 billion annually through road crashes. 20 per cent of this loss, which is about US \$ 100 billion, occur in the developing and transition countries of Eastern Europe. Yet the funding for research and development in road safety is just tens of millions of dollars. In essence therefore, the annual loss incurred by the developing countries as a result of road transport crashes, far exceeds the total annual aid and grants received by these countries (Victoria, 2008).

A joint World Health Organization (WHO) and World Bank report, (2004) indicate that road crashes kill 1.2 million people annually and injure 50 million more. The majority of these people are in the developing countries. Globally, road crashes are the second cause of deaths for people aged between 15-29, and the third cause of deaths for those falling between ages 30 - 44.

In fact, road crashes are currently the ninth major cause of deaths and disabilities worldwide and are projected to rise by 65 percent by the year 2020, placing it third after heart diseases and depression, but behind current major killers like Malaria, Tuberculosis and HIV/Aids. Although motor-vehicle-related crashes in the developed world are projected to reduce by 30 per cent between the periods 2000 - 2020, it is expected to increase by 80 per cent in the developing world.

According to the World Health Organization and World Bank research, the developing world has only 20 per cent of vehicles in the world, but cause up to 80 per cent of vehicle related deaths (WHO & World Bank, 2004). While these global figures paint a gloomy picture of the developing countries in as far as road crashes are concerned, they conceal the realities of country-specific road carnage. Kenya for example, has experienced phenomenal increase in road crashes over the years. Between 1981-1990, road crashes in Kenya increased at an average rate of 4 per cent p.a from 7,250 to 10,308 while road accident fatalities increased at an average rate of 0.9 per cent p.a from 1,720 to 1856 people. In 1990 alone, Kenya had a casualty per road accident of 1.84. In the same year, there were 29 road crashes per 1,000 motor vehicles operating in the country and 53 fatalities per 10,000 motor vehicles. Between 1990 and 1992, fatal road crashes increased phenomenally from 17 per cent in 1990 to 21 per cent in 1992. Presently, Kenya witnesses an average of 13,000 crashes annually, out of which 3,000 lives are lost while more than 11,000 injuries are sustained annually from road crashes. In 2002 alone, 13,428 crashes occurred, involving 28,774 people, of which, 2782 or 10 per cent lost their lives, and 10,912 or 38 per cent sustained serious injuries, while 15,000 or 52 per cent were slightly injured. The data places road crashes as the third cause of fatalities in Kenya after malaria and HIV/Aids (Odero, et al, 2003).

The government of Kenya reports that, over the years, there has been an increase in the annual cost of road crashes costing the Kenyan economy an average of about Kshs. 100 Million or 1.7 % of the GDP in 1981. In 1997, an estimated 26 per cent to 52 per cent

was recorded as losses from earnings as a result of road crashes. This high cost translates to about Kshs.14 Billion worth of the Kenyan economy an equivalent of 5% of the Kenyan GDP compared to developed countries economies that ranges from 1-2% of their Gross Domestic product (Odero, et al, 2003).

Research based on Tadarera (2012) shows that, road transport is currently the most widely used transport mode in Kenya, handling close to 80 per cent of both passenger and cargo transportation. Road transport eases mobility of the factors of production, creates direct and indirect employment, provides income to the government and to the road transport service providers, and facilitates linkages within the economy. During the period between 1998 and 2002, for example, the average contribution of the transport sector to Kenya's economy stood at 8.5 per cent of the GDP, of which the road transport sub-sector had the lion's share of 2.9 per cent of the GDP. It is projected that between 2003 and 2007, the transport sector will grow at an annual rate of 6.26 per cent (Tadarera, 2012). From the surface of it, this looks meticulous. However, when one considers the fact that road transport crashes cost Kenya 5 per cent of her GDP, it becomes clear that road transport is a net robber of the national economy to the tune of 2.1 per cent of the GDP (Odero, et al, 2003).

Road traffic safety can be defined as means/ways of ensuring that those interacting with the road network are not subjected to the risk of injury or death. It's estimated that between 3000 and 13000 Kenyans lose their lives in road traffic crashes every year. The majority of these people are road users such as pedestrians, motorcyclists, and cyclists who are likely to be caught up in these crashes. In addition, nearly one-third of deaths are among passengers; many of whom are killed in unsafe forms of public transportation.

The industry heavily relies on transportation ensuring movement of its goods, services and persons from one point to another. This interaction coupled with industrial growth

has seen an increase in number of road crashes three fold impacting on the safety of those involved. The main causes of these accidents has been attributed to reckless/careless driving, poor roadworthiness of vehicles and poor roads conditions.

The beverage sector has thus continued to encounter increased fleet related incidents, some of them leading to fatalities of its employees and to the members of the public.

The increased accidents are very costly to the business in terms of loss of lives, repair costs to damage on company equipment and property/Replacement cost, medical and compensation costs, litigation resulting in unbudgeted legal costs, lost work hours attending to preventable accidents, higher insurance premiums, incidents denting the company's public image and affecting the Social license to operate which could lead to the eventual closure of the plant.

This research sought to identify the number of accidents and their causes recommending ways in which they can be addressed while seeking to evaluate if review of policies and procedures would also address some pertinent issues leading to a culture whereby the employees follow the rules because they 'want to' and not because they 'have to'.

Accidents and ill health disrupt normal operations and is a potential addition to the company's operating costs. Some of the health and safety losses that may arise as a result of the same include: Moral and social issues; pain, grief and suffering among the workforce and their families, negative publicity (Reputation), economic issues; poor safety performance due to injuries and ill health of employees, damaged plant and equipment, prosecution fines, claims for damages from injured party, fire damage to process or plant, increased insurance premiums and business interruption and loss of goodwill. It also includes: legal requirements; court time (due to Litigations), fines and costs, civil cases and notices.

This research gives a clear highlight of what needs to be done to resolve the current

issues by providing clear policies and procedures, proper enforcement for a positive fleet safety culture and reduced deaths and accidents on the roads at the Kenyan beverage sector.

2.2.2 Management Commitment to Safety

There's a lot of emphasis on the importance of management commitment in guaranteeing fleet safety. Majority of the writers agree that management commitment is key in regards to success of any safety and health program. This means that management must be ready and willing to provide all the support and allocate resources on program development, safety tools and equipment, workers training among others. The management can demonstrate its commitment through development of safe working procedures by calling out fleet safety requirements that should be adhered to by the workers and ensure that the information is made available to all in the simplest form possible to enhance good understanding of the content. The written information should include but not limited to minimum requirement for recruitment of drivers, reevaluation of the drivers and truck helpers' competency on the road, the frequency of refresher courses offered to the drivers annually, basic knowledge of the signs found on the road, basic skills on defensive driving and their awareness on the government's stipulated laws pertaining road safety. The program should also outline procedures for routinely inspecting the fleet safety program's success with clear responsibilities in a defined period of time.

2.3 Previous Related Studies

According to Wiegmann et al (2007) Fleet crashes impacts greatly on productivity within the industries due to work related fatalities and injuries. 25-33% of the deaths in the United States is as a result of road crashes. Finland as well estimates that road related

deaths accounts for about 38-68%, with France, Canada, Australia and Denmark/United Kingdom/Sweden recording about 40%, 30% , 47% and 25% work-related crashes respectively (Wiegmann et al (2007)

According to past research, fatigue has been categorized as a major factor leading to road crashes as it leads to slow reaction time, reduced alertness and information processing (Luke et al, 2014). Center for accident and research and road safety ranks fatigue as one of the leading factors resulting to road crashes (Anderson, 2005).

Principle in bad driving habits is the lack of respect for the set traffic rules (laws and regulations). It is estimated that about 70% of the fatal injuries and accidents are as a result of intentional and habitual driver's errors.

Often the contributing factors as per past research include inexperience, speeding, intoxication (from drinking or drugs) or just plain recklessness. Other more subtle causes are fatigue from overworked drivers who doze at the wheel and lose control.

Past research suggests that driver distraction is a primary factor in 12.9% of all crashes (Reber et al., 1993). Driver distraction includes such elements as talking on cell phones, talking to passengers, reaching to floor or into a pocket et cetera, smoking, eating or drinking, looking outside and so on.

Previous studies have reported factors that might be contributory to the high accident rates in developing countries as the road surface, vehicle condition and road-user behaviour.

2.4 Legal Framework

Kenya has made significant strides in road safety management through the creation of the lead national agency known as the National Transport and Safety Authority

(N.T.S.A) in the Ministry of Transport and Infrastructure as it takes the lead on road safety matters.

National Transport and Safety Authority (NTSA) is a state corporation whose mission is to continually improve accessibility of Kenya's roads transport system for all users and bring sanity on the Kenyan roads. NTSA coordinates motor vehicle registration, transport licensing and motor vehicle inspection, road safety, and driver testing and to some extent traffic law enhancement under the NTSA 2012. According to NTSA (2013), road traffic crashes exert a huge burden to the Kenyan economy. The report indicates that from the time Kenya attained independence from the British rule in 1963, there has been a dramatic increase in traffic deaths in Kenya; From 568 in 1963 to 3158 in 2008, a 476% increase over a period of 45 years. Other related regulations in road safety include the Traffic (Amendment) Act 2012, the Occupational Safety and Health Act, 2007 among others.

NTSA works hand in hand with the National Police Service units, County Governments, National Governments among other partners in ensuring that policies are formulated and implemented at various levels in regards to road transport sector. DOSHS under the Ministry of Labour in Kenya ensures the safety, health and welfare of all workers in the workplaces by enforcing the Occupational Safety & health Act, 2007.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Introduction

This chapter presents a detailed description of the research design, data collection procedures, target population and sampling; it defines the target population and sampling technique which was applied including data validity and data analysis.

3.2 Research Design

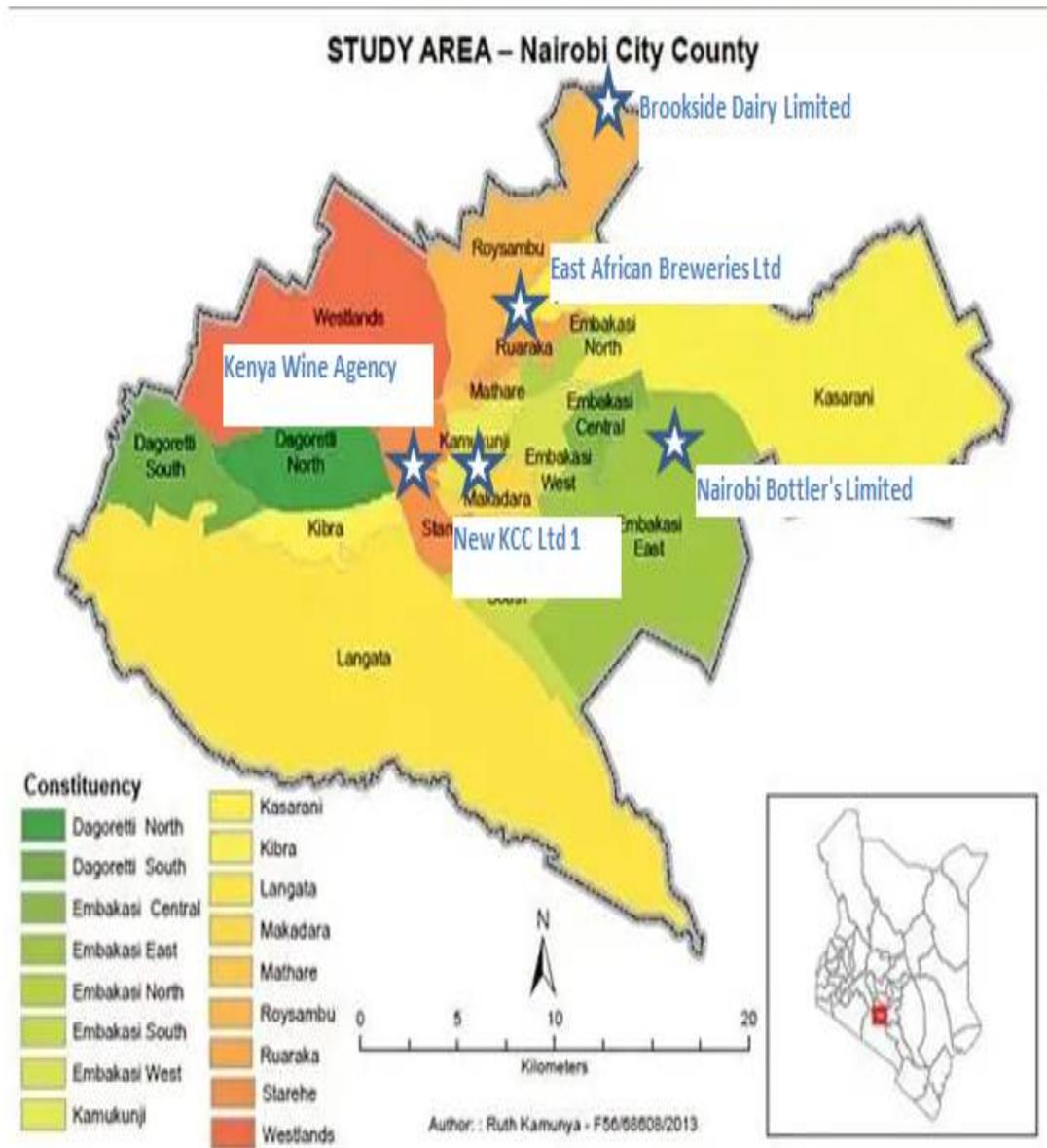
This study employed a cross sectional descriptive design incorporating both qualitative and quantitative data. The study focused on implementation of fleet safety management in the Kenyan beverage industries, Nairobi County. This design was adopted as the population was finite.

3.3 Study Area and Population

This study was based in the Nairobi county area where 80-90% of the industries are situated, with particular interest in five beverage industries that were coded to maintain confidentiality as per Table 3.1 below. The target population comprised of drivers, turn boys, forklift operators and management, with the safety departments facilitating collection of the relevant secondary data for research purposes. The exposed population was 600.

Table 3. 1: List of Selected Beverage Industries in Nairobi County

No	Name of the beverage industry	Number of fleet	Type of Fleet
1	Brookside Dairy Ltd.	Over 100	Outsourced/Owned
2	Kenya Wine Agencies Ltd.	Fleet Below 100	Outsourced/Owned
3	Coca-Cola Sabco-Nairobi Bottlers Ltd.	Over 100 fleet	Owned
4	Kenya Wine Agencies Ltd.	Fleet Below 100	Outsourced/Owned
5	East African Breweries Ltd.	Over 100 fleet	Outsourced



Source: (Kamunya, 2013)

Fig.3. 1: Location of Selected Beverage Industries in Nairobi County

3.4 Sampling design and procedure

Simple random sampling was used to obtain the representative sample to be used in the study. In this case, every member of the population had an equal opportunity to be selected to participate in the study.

3.6 Sample size determination

The sample size determination was based on Yamane (1967) formula that provides a simplified way of calculating sample sizes. A 95% confidence level and $P = 0.5$ are assumed for the Equation.

i.e.

$$n = \frac{N}{1 + N(e)^2}$$

Equation 3.0: Yamane (1967: 886): Sample size Determination

Where n is the sample size, N is the population size, and e is the level of precision. When this formula is applied to population of $N= 600$ of the exposed population, Equation 3.1 below is obtained.

$$n = \frac{600}{1 + 600(0.05)^2}$$

Equation 3.1: Yamane (1967): Sample size for exposed population

The sample sizes for the selected beverage industries within the Nairobi County were as below;

Table 3. 2: Sample Size Determination and Distribution

Company code	Exposed Population size	Sample size
A	170	68
B	200	81
C	100	38
D	70	29
E	60	24
Total Population size	600	240

The sample size for this study was 240 (n=240)

3.7 Data collection instrument

Data was collected using questionnaires, observation and interview schedules developed by the researcher. The instruments were designed to capture items on specific fleet safety implementation programs and challenges while some information was collected from the respondents by asking them specific questions using of face- to- face interview. Answers were recorded in the questionnaires and some photos taken to support the observations. Secondary data from existing trending records were also reviewed.

3.8 Data collection procedure

All necessary research protocols were followed. Participants at the various organizations

were informed in advance to prepare them to participate in the study. Questionnaires were administered and participants completed them in the presence of the researcher, while others were left and collected at later dates. Observation and face-to-face interviews were also administered. The completed questionnaires and other evidence collected during the site visits were put together for analysis.

3.9 Data analysis

Data in this study was analyzed using descriptive statistics including means, frequencies and percentages. Data was edited, entered, coded and summarized based on objectives. Where necessary, some data was analyzed qualitatively using content analysis. The Statistical Package for Social Science (SPSS) Version 20 was used to analyze data.

3.10 Validity and reliability

Both content and construct validity of instruments was determined .Content validity ensured that the items in the questionnaire were adequately representative of the subject area ; while construct validation ensured the instrument actually measures what it is supposed to measure (Warren & Russell, 2012). The researcher therefore carefully selected the items to be included in the instrument based on research objectives.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results and findings, discussions and interpretation of the study carried out on the fleet safety management in the Kenyan beverage industries, Nairobi County.

4.2 Characteristics of the target population

4.2.1 Response rate

The study targeted a sample size of 240 respondents in which 229 (180 truck drivers and 49 managers) completed the questionnaires making a response rate of 95.4%. Mugenda and Mugenda (2003) argue that a rate of 50 percent or higher is adequate for data analysis. This implies that the returned questionnaires which were properly filled and hence had completeness on data correctness which was adequate for the study.

Table 4. 1: Response rate

Organizati on	Truck Drivers		Managers	
	Frequen cy	Perce nt	Frequen cy	Perce nt
A(Non Alcoholic)	46	25.6	16	32.7
B(Alcoholi c)	55	30.6	18	36.7
C(Non Alcoholic)	38	21.1	5	10.2
D(Alcoholi c)	20	11.1	7	14.3
E(Non Alcoholic)	21	11.7	3	6.1
Total	180	100.0	49	100.0

4.2.2 Respondents' Demographics

In order to establish how fleet safety is implemented in the beverage industry, demographic data such as education, marital status, and gender for truck drivers was determined as shown in **Table 4.2** below. The level of education was also sought from the respondents. Overall results showed that almost two thirds (62.3%) of the study participants had secondary education with 27.2% having post-secondary education with 10.6% having primary education. This variation in education level ensured varied responses which richly contributed to getting very valuable information for the study.

Table 4. 2: Respondents' Demographics (Truck Drivers)

	Category	Frequency	Percent
Gender	Male	135	75.0
	Female	45	25.0
Marital status	Single	13	7.2
	married	153	85.0
	Widowed	10	5.6
	Divorced	4	2.2
	Primary	19	10.6
Level of education	Secondary	112	62.3
	Tertiary/College	36	20.0
	University	13	7.2
Total		180	100.0

In total three quarters (75%) of the respondents were male while female formed a quarter (25%) of the sample. Bureau of labour statistics, 2012 records that over 3 Million people who earn their living from truck driving; only 6% are female. This research also concurs with findings by Voic, 2010 and Lee Ellis, 2008 who reported that the truck industry is more likely to be male dominated. The study showed that 153(85.0%) participants were married, 13(7.2%) were single, 10(5.6%) widowed, while 4(2.2%) were divorced **Table 4.2**. Majority of the workers were married, therefore emotionally mature and from an occupational safety and health perspective expected to be risk averse as a result of implied behavioral stability and the family factor. The level of education was also sought from the respondents. Overall results showed that almost

two thirds (62.3%) of the study participants had secondary education with 27.2% having post-secondary education with 10.6% having primary education. This variation in education level ensured varied responses which richly contributed to getting very valuable information for the study.

Terms of employment were either permanent, contract or casual among the truck drivers as shown in **Table 4.3**. A total of 93(51.7%) were employed on contract terms, 60(33.3%) were employed on permanent terms while 15(8.3%) were casuals. Further, from focus group discussions with the managers majority of the drivers who were on contract terms were employed through outsourcing of services from logistics companies. Mostue (2001) observed that most firms with complex logistics consider outsourcing of logistics services to external logistics services providers. This has implication in terms of accountability of the workers and obligations at the workplace.

Table 4. 3: Terms of employment (Truck Drivers)

	Frequency	Percent
Permanent	60	33.3
Contract	93	51.7
Casual	15	8.3
No response	12	6.7
Total	180	100.0

Effective fleet safety is a factor of experience and training. Fleet safety training should be focused on increasing safety knowledge and improving drivers' response to safety issue with the aim of reducing the number of accidents, incidents and related casualties. At the beverage industry, this was sought in order to understand the drivers and

managers level of training and the experience in terms of years of working and as indicated in **Table 4.4** and **Table 4.5**.

Majority of the truck drivers (35.0%) had worked with their organization for 4-5 years while a good number (26.7%) reported to have worked with their organization for over 7 years. These results show that most of the truck drivers were familiar with the fleet safety in their respective industries and could thus give reliable information. Under the management of Health and Safety at work Regulations (OSHA, 2007), an employer has a responsibility of ensuring that young and new workers employed by them are not exposed to risk due to lack of experience or being unaware of existing or potential risk and or lack of maturity.

Table 4. 4: Length of work in the company (Truck Drivers)

	Frequency	Percent
Between 0-3 Years	31	17.2
Between 4-5 Years	63	35.0
Between 6-7 Years	25	13.9
Over 7 Years	48	26.7
No response	13	7.2
Total	180	100.0

Results for the managers showed that majority of them (42.9%) had been working in the fleet department in various organizations for 3-4 years while almost a third (30.6%) had been working for over 6 years which indicates a better understanding of the business from the fleet safety aspect.

Table 4. 5: Length of professional experience in fleet safety management (Managers)

	Frequency	Percent
Between 0-2 years	10	20.4
Between 3-4 years	21	42.9
Between 5-6 years	3	6.1
Over 6 years	15	30.6
Total	49	100.0

4.3 Fleet accidents and their causes

To obtain the average number of work related fleet accidents recorded annually within the beverage industries in Nairobi, Kenya, managers were asked to indicate the average number of fleet accidents their organization registered for a period of the past 5 years.

The organizations classified the accidents into 2 categories mainly major and minor. A minor accident was defined as an incident that did not lead to an injury, damage nor affect the road worthiness of the truck while a major accident was referred to as an incident that resulted to an injury which could include a fatality or an impact on the road worthiness of the vehicle.

Results in Figure 4. 1 shows an increasing trend of accidents across all the organizations. Company A recorded 10 accidents in year 2014 and 2015 up from 2.5 in year 2011 and 2012, having recorded 7 accidents in 2013, an increasing trend over the years. Company C had an increasing trend from year 2012 where zero accidents were recorded to 2015 where 10 accidents were recorded. This upward trend can be attributed to the increased vehicle ownership registered over the years.

The findings of this study support those of WHO (2012) that anticipated road traffic accidents increase due to increased motor vehicle ownership and use which is linked to the economic growth in both low- and middle-income countries stating that road traffic accidents continue to emerge as a leading cause of death and disability in developing countries (WHO, 2013).

A study by Adebisi et al. (2007) reported that developing countries where rapid motorization is expected over the period to 2020 and beyond are very likely to experience increasing road crashes and rising levels of fatalities and injuries. The research further reveals that motorists in such countries will face increasing risks on the roads, unless appropriate action is taken.

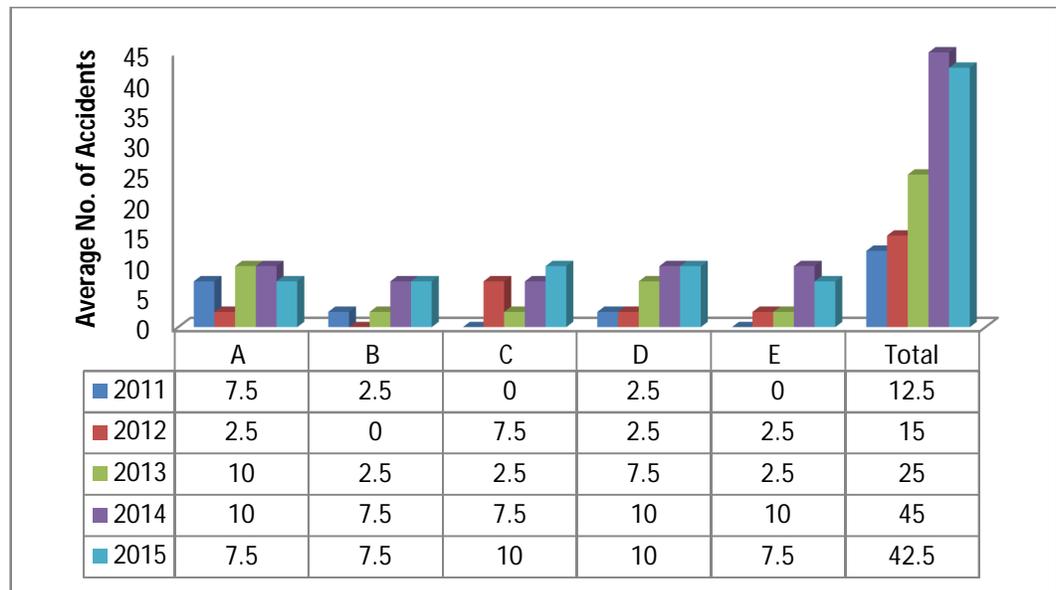


Figure 4. 1: Number of accidents reported annually over the past five years (Managers)

Managers were further asked to state the main causes of accidents in their respective organizations according to the incidents investigations. Results showed that driver

fatigue 30(68.2%), high speed 23(52.3%) and aggressive driving behavior such as overlapping, tailgating, cutting off other drivers among others at 17(38.6%) as the three main causes of accidents. Other causes included; Intoxication (Alcohol and drugs), Defective, hazardous and dangerous roads and Defective vehicles. Drivers cited use of mobile phones while driving as a major cause of distraction leading to accidents based on the questionnaires.

The findings support those of Odero, (2003) who documented that drivers have been blamed for careless driving, incompetence, over speeding, drunk driving and a myriad of other vices that render them prone to causing accidents that could have been avoided in the first place.

These finding also supports a research by Odero et al. (2003) that recorded that based on the Accident Cause Code Classification, Kenya Police reports reveal that 85.5% of crashes are caused by poor driver behavior, of which driver error represents 44.4%, pedestrians and passengers 33.9% and pedal cyclists 7.2%. Other proximal factors include vehicle defects 5.1%, road environment 2.9%, and other factors 6.4%.

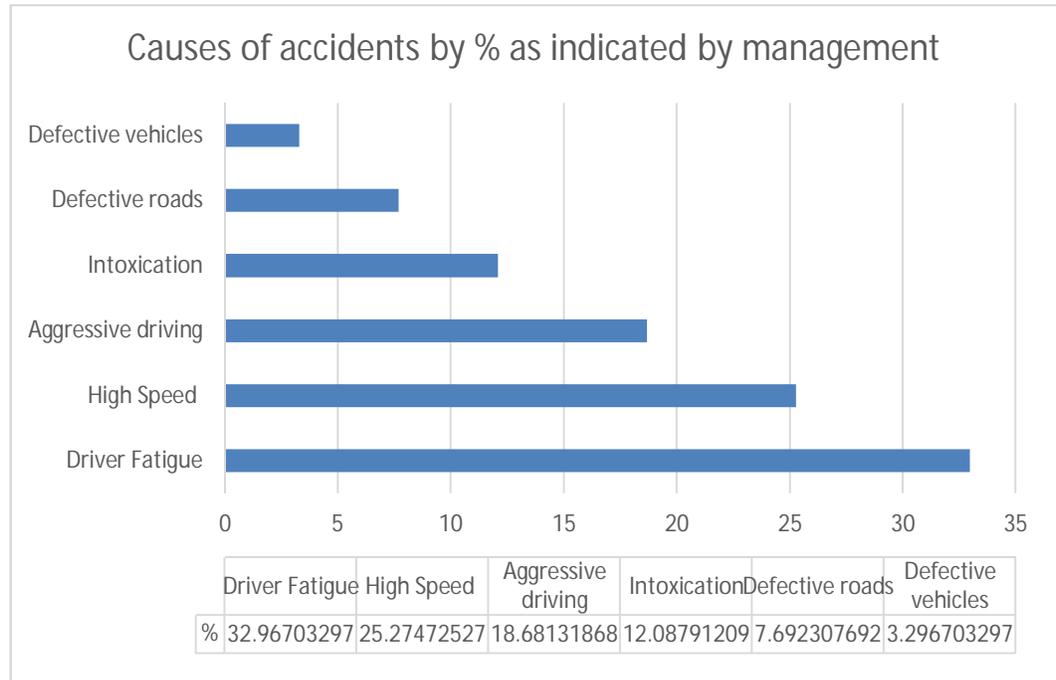


Figure 4. 2: Major causes of fleet accidents (Managers)

Association between respondents’ type of organization and the number of accidents reported over the past five years was sought and results displayed as shown in data on Table 4. 6. Where equal number of respondents (15) who reported between 0-5 accidents in the past five years for both non-alcoholic and alcoholic beverage industry. Similarly almost equal numbers of respondents reported over 5 accidents in the past five years for both non-alcoholic 9(37.5%) and alcoholic 8(40.0%) beverage industry. This association of respondents’ organization and average number of accidents reported over the past five years was statistically insignificant at 95% confidence level with χ^2 (df=1) =0.32 since $p=.858$ was greater than the conventional 5% level of significance. This indicated that the type of beverage industry whether alcoholic or non-alcoholic didn’t affect /influence the number of accidents recorded by organization within the said period.

Table 4. 6: Cross-tabulation of reported accidents by organization

Variable	Category	Average number of accidents reported over the previous five years		Chi-Square
		Between 0-5 accidents	Over 5 accidents	
Beverage industry	Non-alcoholic	15(62.5%)	9(37.5%)	$\chi^2=0.32$, df=1, p=.858
	Alcoholic	15(60.0%)	10(40.0%)	

4.4 Level of awareness and driver behavior on fleet safety

To determine level of awareness on fleet safety, drivers were presented with several yes/no questions on their level of awareness. Majority of respondents (93.4%) reported that recruitment of drivers in their company is based on adequate driving experience and competence. On the other hand most of the respondents (91.6%) had received an induction (orientation) course on joining their organization. Further, majority of the respondents (86.6%) were taken through an assessment (testing) for driver fitness and competence by an independent trainer after the induction (orientation) course. All respondents would like to attend future training programs of a similar nature. Most of the respondents (86.2%) reported that after initial induction (orientation) training, other training (such as defensive training) have been done and impacted positively on their driving performance according to 93.1% of the respondents. Almost all the respondents (95.8%) reported availability of road/fleet safety awareness education policy in their

organization and 91.0% of them could access it. Majority of the managers (83.8%) had participated in a road/fleet Safety Awareness Education seminar/workshop.

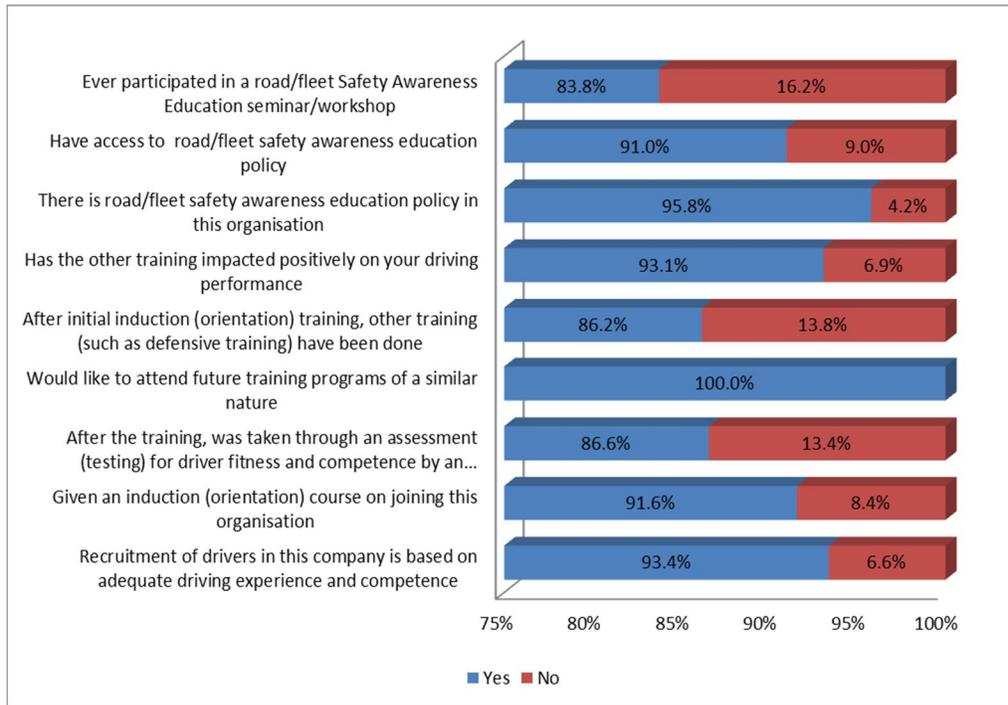


Figure 4. 3: Level of awareness on fleet safety (Truck Drivers)

Respondents were further asked to state the method of induction training and the time and number of days it took. Most of the respondents (40.1%) reported that the method used was both on the job training (illustrative) and off the job training (classroom). More than a third of the respondents (34.9%) had off the job training (classroom) while a quarter had on the job training (illustrative).

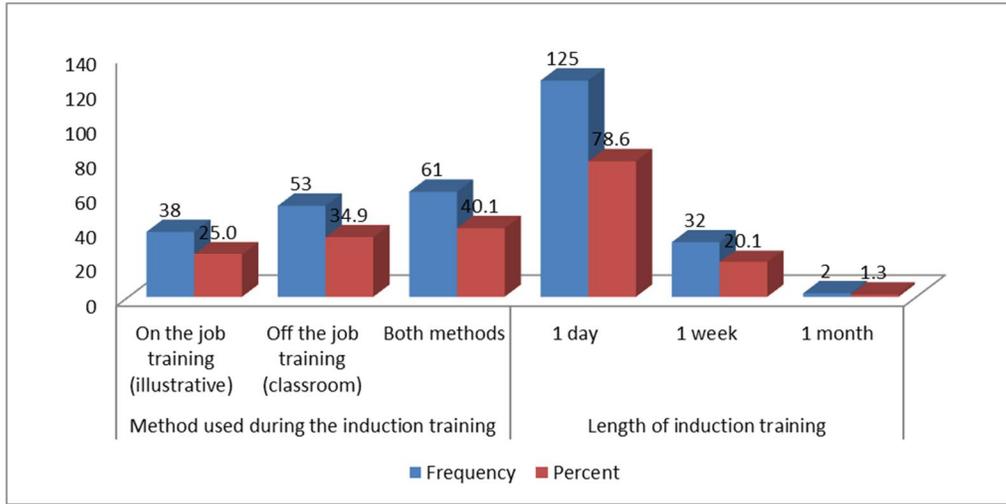


Figure 4. 4: Method and length of induction training (Truck Drivers)

When asked to rate the current level of road/fleet safety awareness in their organization majority of the respondents (46.1%) rated it as good while 45.5% as very good. More than half of the respondents (61.2%) rated management's current contribution to road/fleet safety awareness in their organization through awareness education as satisfactory while 38.8% rated it as fair.

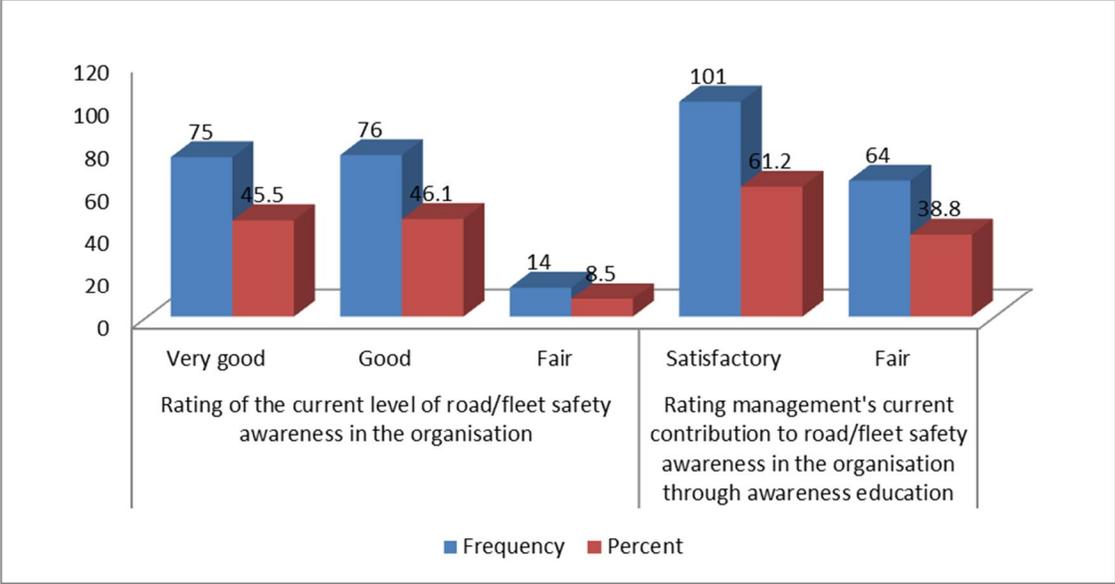


Figure 4. 5: Rating of fleet safety awareness (Truck Drivers)

The study also sought to find out the length of time the drivers worked in a day on average. Majority of the respondents (45.5%) reported to be working for 8-10 hours while close to a third (31.5%) reported to work for above 12 hours.

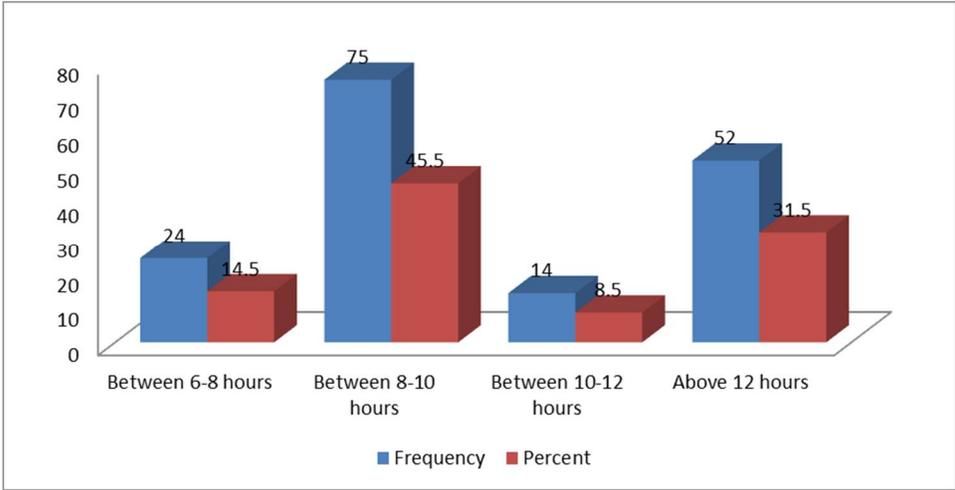


Figure 4. 6: Working hours in a 24 hours day (Truck Drivers)

The respondent's responses on recruitment of drivers was subjected to chi statistics against gender, level of education and experience parameters as shown in **Table 4.7**. Results showed that more male (90.9%) than female (72.7%) reported that recruitment of drivers in their company is based on adequate driving experience and competence. This association of recruitment of drivers and gender of the respondents was statistically significant at 95% confidence level with χ^2 (df=1) =4.381 since p=.036 and is less than the conventional 5%.

More respondents (29.4%) with primary education reported that recruitment of drivers in their company is not based on adequate driving experience and competence compared to those with secondary (4.0%) and post-secondary (10.2%) education. This association of recruitment of drivers and level of education of the respondents was statistically significant at 95% confidence level with χ^2 (df=2) =7.215 since p=.027 is less than the conventional 5%.

More respondents (21.3%) with over 5 years of experience reported that recruitment of drivers in their company is not based on adequate driving experience and competence compared to those with fewer years of experience (6.2%). This association of recruitment of drivers and years of experience of the respondents was significant at 95% confidence level with χ^2 (df=1) =9.719 since p=.021 is less than the conventional 5%.

Table 4. 7: Recruitment of drivers by Respondents' Demographics (Truck Drivers)

Variable	Category	Recruitment of drivers in this company based on adequate driving experience and competence			Chi-Square
		Yes	No		
Gender	Female	8(72.7%)	3(27.3%)	$\chi^2=4.38$ 1, df=1, p=.036	
	Male	110(90.9%)	11(9.1%)		
Highest level of education	Primary	12(70.6%)	5(29.4%)	$\chi^2=7.21$ 5, df=2, p=.027	
	Secondary	96(96.0%)	4(4.0%)		
	Post-Sec.	44(89.8%)	5(10.2%)		
Length of work at the company	0- 5 yrs	91(93.8%)	6(6.2%)	$\chi^2=9.71$ 9, df=1, p=.021	
	Above 5 yrs	60(78.7%)	9(21.3%)		

The respondent's responses on induction (orientation) course on joining the organization was subjected to chi statistics against gender, level of education and experience

parameters as shown in **Table 4.8**. Results showed that more male (88.5%) than female (64.3%) reported to have had induction (orientation) course on joining the organization. This association of induction (orientation) course and gender of the respondents was significant at 95% confidence level with χ^2 (df=1) =5.363 and p=.018.

More respondents (36.8%) with primary education reported not to have had induction (orientation) course on joining the organization compared to those with secondary (5.0%) and post-secondary (10.0%) education. This association of induction (orientation) course and level of education of the respondents was significant at 95% confidence level with χ^2 (df=2) =12.215 and p=.001. This indicates a better understanding of the induction process for those with secondary school education and above compared to the primary school level drivers. More respondents (13.0%) with over 5 years of experience reported not to have had induction (orientation) course on joining the organization compared to those with fewer years of experience (7.1%). This association of induction (orientation) course and years of experience of the respondents was significant at 95% confidence level with χ^2 (df=1) =6.767 and p=.031. This association indicates a scenario where the organizations are keen to induct newly employed drivers paying less attention to the very experienced drivers who have been on the job for a longer time. This approach should be reviewed to ensure sensitization on fleet safety continues even for the very experienced drivers.

Table 4. 8: Induction (orientation) course by Respondents' Demographics

Variable	Category	Induction (orientation) course on joining the organization		Chi-Square
		Yes	No	
Gender	Female	9(64.3%)	5(35.7%)	$\chi^2=5.363$, df=1, p=.018
	Male	108(88.5%)	14(11.5%)	
Highest level of education	Primary	12(63.2%)	7(36.8%)	$\chi^2=12.215$, df=2, p=.001
	Secondary	95(95.0%)	5(5.0%)	
	Post Sec.	45(90.0%)	5(10.0%)	
Length of work at the Co.	0- 5 yrs	91(92.9%)	7(7.1%)	$\chi^2=6.767$, df=1, p=.031
	Above 5 yrs	60(87.0%)	9(13.0%)	

The respondent's responses on availability of road/fleet safety awareness education policy in the organization was subjected to chi statistics against gender, level of education and experience parameters as shown in **Table 4.9**. Results showed that more male (94.3%) than female (86.7%) reported availability of road/fleet safety awareness education policy in the organization. This association of availability of road/fleet safety

awareness education policy in the organization and gender of the respondents was significant at 95% confidence level with χ^2 (df=1) =2.695 and p=.044.

More respondents (22.2%) with primary education reported lack of road/fleet safety awareness education policy in the organization compared to those with secondary (5.0%) and post-secondary (12.2%) education. This association of availability of road/fleet safety awareness education policy in the organization and level of education of the respondents was significant at 95% confidence level with χ^2 (df=2) =5.449 and p=.034. This confirmed the earlier association on the understanding gap that exists for the case of the primary school education level for the drivers.

More respondents (91.4%) with less than 5 years of experience reported availability of road/fleet safety awareness education policy in the organization compared to those with more years of experience (90.4%). This association of availability of road/fleet safety awareness education policy in the organization and years of experience of the respondents was insignificant at 95% confidence level with χ^2 (df=1) =1.540 and p=.468 implying that the drivers irrespective of their experience were properly inducted to fleet safety.

Table 4. 9: Availability of road/fleet safety awareness education policy by Respondents' Demographics

Variable	Category	Availability of road/fleet safety awareness education policy in the organization		Chi-Square
		Yes	No	
Gender	Female	39(86.7%)	6(13.3%)	$\chi^2=2.69$ 5, df=1, p=.044
	Male	115(94.3%)	7(5.7%)	
Highest level of education	Primary	14(77.8%)	4(22.2%)	$\chi^2=5.44$ 9, df=2, p=.034
	Secondary	95(95.0%)	5(5.0%)	
	Post Secondary	43(87.8%)	6(12.2%)	
Length of work at the company	0- 5 yrs	85(91.4%)	8(8.6%)	$\chi^2=1.54$ 0, df=1, p=.468
	Above 5 yrs	66(90.4%)	7(9.6%)	

Participation in road/fleet Safety Awareness Education seminar/workshop was subjected to chi statistics against gender, level of education and experience parameters as shown in **Table 4.10**. Results showed that more female (88.9%) than male (77.9%) reported to

have participated in a road/fleet Safety Awareness Education seminar/workshop. This association of participation in road/fleet Safety Awareness Education seminar/workshop and gender of the respondents was significant at 95% confidence level with χ^2 (df=1) =11.880 and p=.001.

More respondents (36.8%) with primary education reported not to have participated in a road/fleet Safety Awareness Education seminar/workshop compared to those with secondary (7.1%) and post-secondary (12.5%) education. This association of participation in road/fleet Safety Awareness Education seminar/workshop and level of education of the respondents was significant at 95% confidence level with χ^2 (df=2) =16.108 and p=.001.

More respondents (26.0%) with over 5 years of experience reported not to have participated in a road/fleet Safety Awareness Education seminar/workshop compared to those with fewer years of experience (8.5%). This association of participation in a road/fleet Safety Awareness Education seminar/workshop and years of experience of the respondents was significant at 95% confidence level with χ^2 (df=1) =13.399 and p=.001.

Table 4.10: Participation in a road/fleet Safety Awareness education seminar/workshop by Respondent's Demographics

Variable	Category	Ever participated in a road/fleet Safety Awareness Education seminar/workshop		Chi-Square
		Yes	No	
Gender	Female	40(88.9%)	5(11.1%)	$\chi^2=11.88$ 0, df=1, p=.001
	Male	95(77.9%)	27(22.1%)	
Highest level of education	Primary	12(63.2%)	7(36.8%)	$\chi^2=16.10$ 8, df=2, p=.001
	Secondary	92(92.9%)	7(7.1%)	
	Post Secondary	42(87.5%)	6(12.5%)	
Length of work at the company	0- 5 yrs	86(91.5%)	8(8.5%)	$\chi^2=13.3$ 99, df=1, p=.001
	Above 5 yrs	54(74.0%)	19(26.0%)	

To further assess the drivers' behavior on fleet safety, respondents were presented with a list of statements on Likert's scale and asked to rate the statements with scale running from a low of 1-strongly disagree through 3-neutral to a high of 5-strongly agree.

Results showed that majority of the respondents (78%) strongly agreed that when they drive, they have the responsibility for their safety and the safety of other road users and use of mobile phone while driving causes distraction leading to a majority of accidents. Additionally, close to three quarters of the respondents (71%) strongly agreed that talking on a cellphone or texting while driving, they increased the risk of collision. Most of the respondents strongly agreed that drunk driving is a cause of fatal accidents on the roads (73%) and majority never drive without seatbelt fastened (64%). More than half of the respondents strongly agreed that when going on a long trip, it is important to get plenty of rest before starting out and having a balanced diet (53%) and that alcohol is a depressant meaning it slows down how quickly ones brain works (59%). Majority of the respondents disagreed with the statement that they drink coffee while driving to help them stay awake (82%) and that they consider seatbelts to be uncomfortable (80%). Almost half of the respondents (45%) disagreed that they keep windows down to help them stay awake when really tired or on a long trip. Most of the respondents (95%) agreed that they ensure to put chokes on their truck wheels before any loading or unloading.

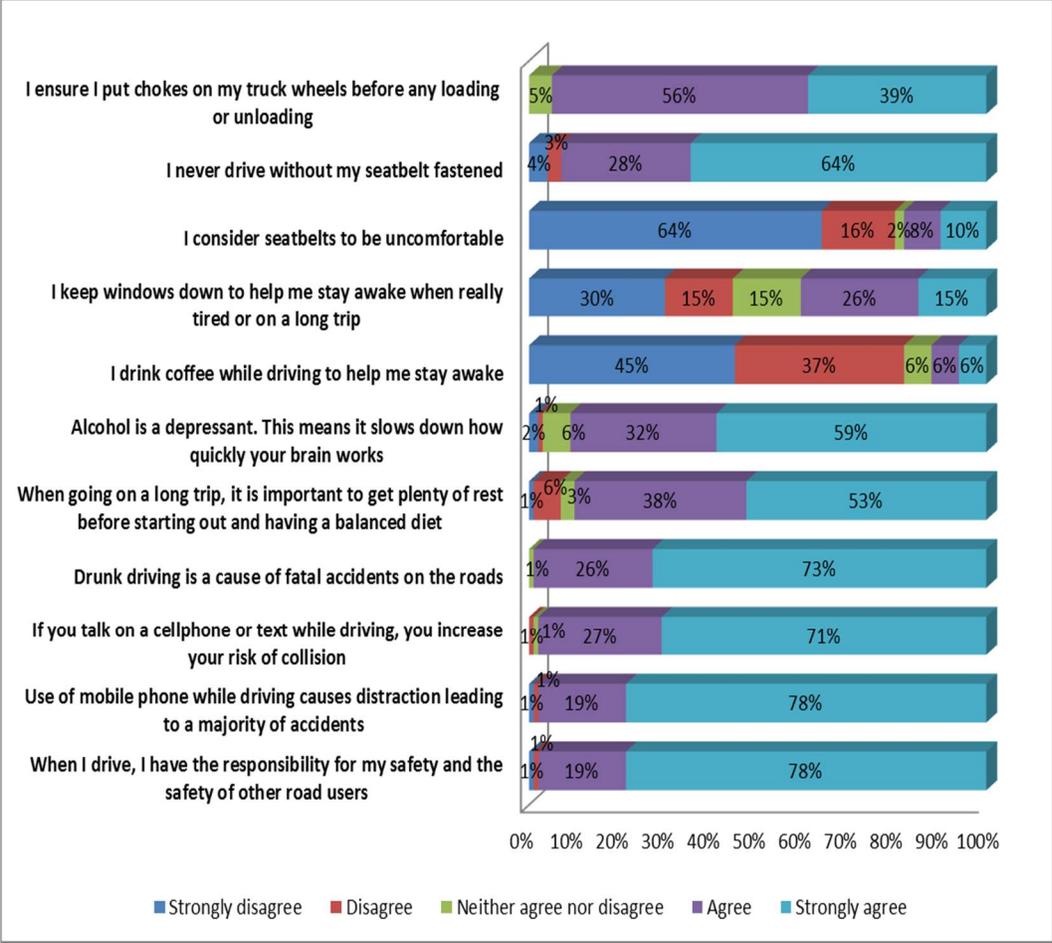


Figure 4. 7: Driver behavior on fleet safety (Truck Drivers)



Plate 4.1: Observed safety practice in company A



Plate 4.2: Observed safety signage in company B

The plate under 4.2 indicates good practices in regards to fleet safety by the drivers where the trucks are chocked during loading and offloading. The management also depicted commitment through provision of visual aids that alert the drivers and other workers as shown on Plate 4.3 of the risks associated with fleet safety as observed in company.

4.5 Control measures implemented to address fleet safety.

Respondents at the management category were presented with various questions to assess control measures being implemented by the various organizations to ensure fleet safety.

All of the respondents acknowledged availability of a fleet safety training program in their organization. Most of the respondents reported presence of a scheduled

maintenance record for each truck in their organization (95.8%) and companywide fleet safety initiative/program (89.6%). More than three quarters of the respondents (78.7%) had ever participated in a fleet safety awareness seminar/workshop. Most of the managers (71.4%) acknowledged that age of the drivers is considered during hiring by their organization with the most preferred age being 35-45 years (Figure 4. 8).The use of signage as a control measure was also observed in most facilities and this helped to minimize on site fleet accidents (Plate 4.3).

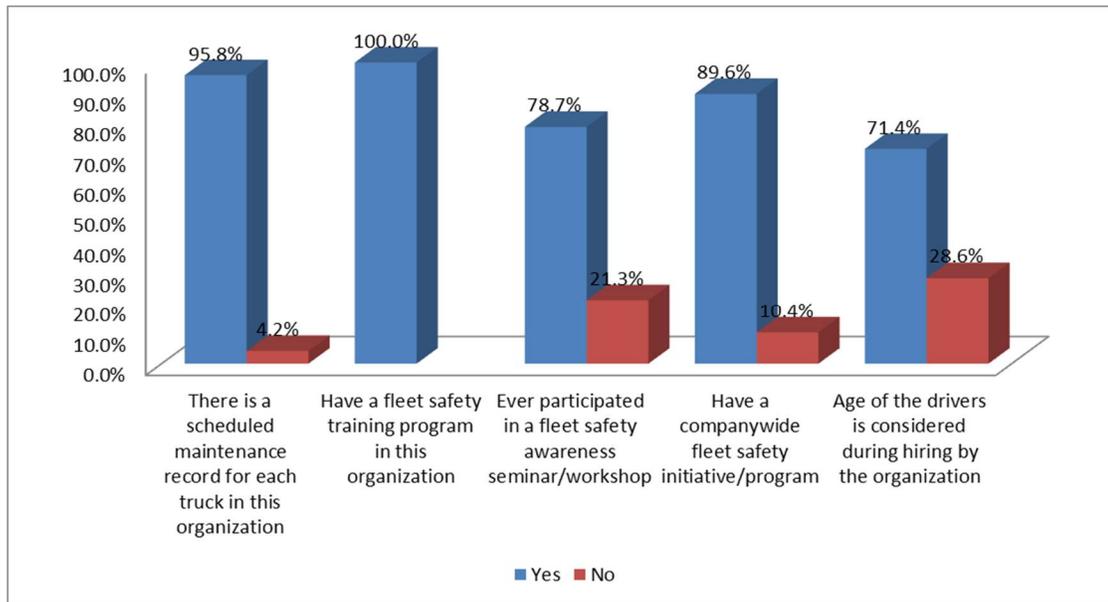


Figure 4. 8: Control measures being implemented to address fleet safety management

In an open ended question, respondents were asked to state the key elements in their organization’s road safety initiative / program where majority mentioned; Policies, fleet rules, training, management commitment, awareness campaigns, vehicle maintenance.

Respondents were further asked to indicate how fleet driving performance of individual drivers is evaluated in their organization. Most of the respondents cited top-down performance evaluation method, supervisor’s feed-back (81.2%) followed by 360-degree performance Reviews, consultative (22.9%) while between 3- 5 Years Peer-to-peer evaluation method (driver-to-driver feedback) was reported by minority (4.2%) (Figure 4. 9).

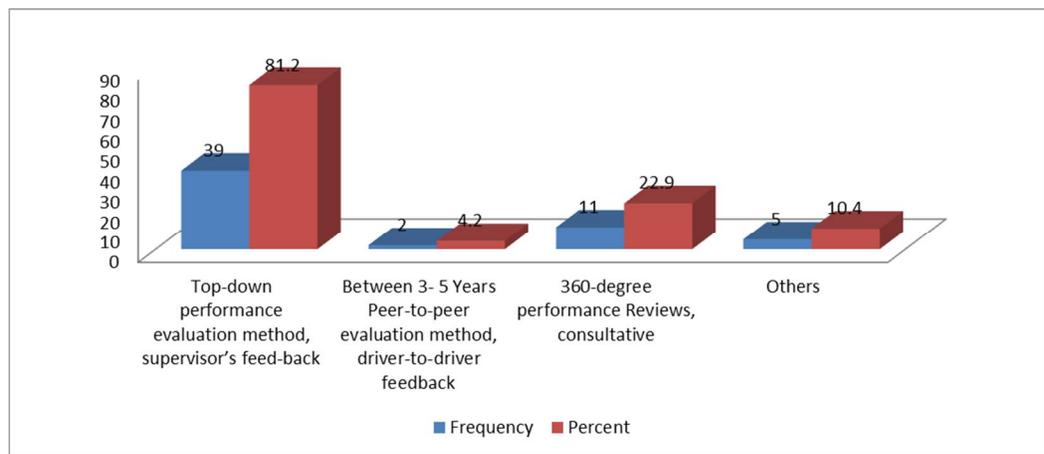


Figure 4. 9: How fleet driving performance of individual drivers is evaluated

When asked how their organization deal with company drivers who violate road safety rules, most of the respondents reported sacking (65.5%) followed by surcharging and fines (28.0%) and retraining (21.7%). Minority cited suspension from work (6.2%) (Figure 4.10).

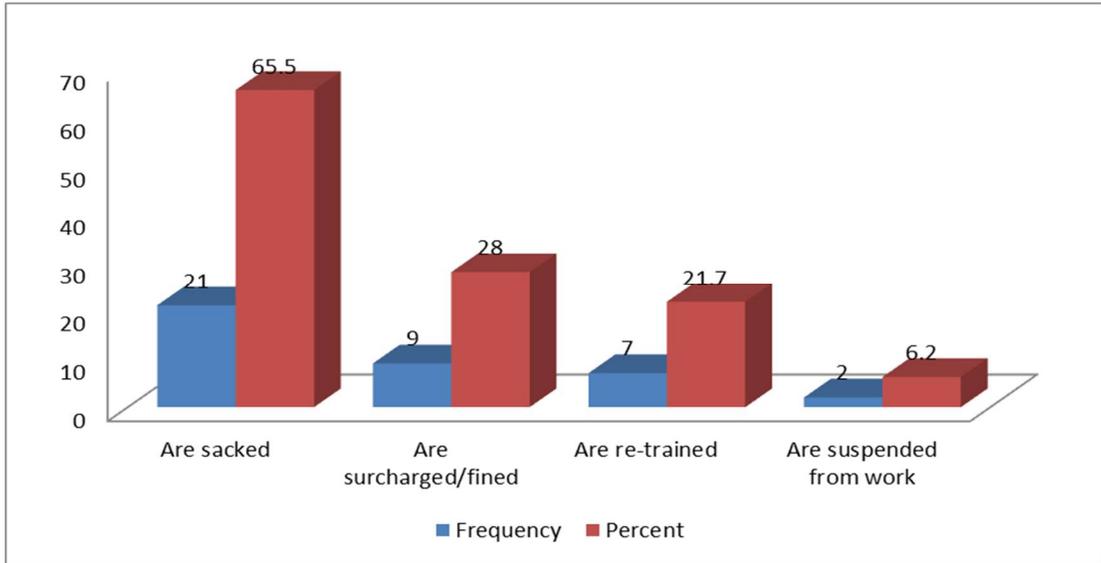


Figure 4.10: Dealing with company drivers who violate road safety rules

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The overall objective of this research was to assess the implementation of fleet safety management in the Kenyan beverage industries, Nairobi County. The study was guided by three specific objectives including; to review the number of work related fleet accidents and their causes within the beverage sector in Nairobi, Kenya; to establish the level of awareness and driver behavior on fleet safety; and to identify the control measures currently being implemented to address fleet safety management.

5.1.1 The number of work related fleet accidents recorded and their causes within the beverage sector in Nairobi, Kenya in the last five years.

Results showed an increasing trend of fleet accidents across all the organizations from about 12 accidents in the year 2011 to 42 accidents in 2015, an almost 4 times increase in 5 years. Fatigue, speeding and aggressive driving (overlapping/offensive driving from other motorists) was cited as the main causes of these accidents with fatigue being directly linked to the long working hours for the drivers in a 24 hours working day. The use of mobile phones was cited as a major cause of distraction while on the wheel by drivers leading to accidents on the road thereby making it a key aspect of the accidents causes on the road.

5.1.2 The level of awareness and driver behaviour on fleet safety

High level of awareness coupled with safe behaviour and training for the drivers was observed and noted as per the research. After recruitment, it was noted that the drivers are taken through an induction process for orientation, classroom and on the job trainings in various organizations. Safe behaviour such as placing of wheel chokes while loading and unloading was observed during site surveys and majority of the drivers strongly agreed to use of safety belts while driving which was determined by use of questionnaires. This however doesn't reflect in the number of accidents which were very high compared to what is expected based on the driver's awareness assessment.

5.1.3 The control measures currently being implemented to address fleet safety

Some of the control measures noted within the organizations included; Displayed fleet safety policies, fleet safety training program (induction, on the job training and defensive driving training) and scheduled maintenance records for individual trucks. The policies, programs, rules and regulations required close monitoring and enforcement in conjunction with NTSA and DOSHS for fleet safety to be successful. The control measures within the industries were therefore not adequate in ensuring an effective fleet safety management system.

5.2 Recommendations

Based on the three research objectives, the following recommendations should be pursued to ensure an effective fleet safety management system;

a). Long working hours for the long distance drivers without sufficient breaks and resting time leads to fatigue that results to the accidents. This study recommends introduction of a face detection mechanism within the trucks cabin as a control of how long a driver can be behind the wheel while driving. The interface within the trucks cabin should be able to alert the driver to take a break and gradually prompt the truck to come to a stop until the detected face has taken a timed break. This intervention will address fatigue experienced by the drivers as a result of driving for long hours without taking the recommended breaks/rest in between the journey.

b). Use of mobile phones while driving was rated as a major cause of distraction on the roads leading to accidents. The vehicles manufacturers should consider advanced technology on how to put a safety measure that cuts off phone signals while within the trucks cabin with the engine on.

c). Speeding has been cited as a cause to the road accidents in this study. Although most of the vehicles are fitted with speed governing gadgets as per the law, most of them have greatly been tampered with exposing the road users to this risk. Technology should be sought where the speed of the trucks is remotely controlled by the truck owners. This responsibility should not be left to the truck driver. Further, the system should generate a report that is automatically sent to the insurance company to ensure that future insurance premiums match respective records.

5.3 Recommendations for future research

Based on this research, the following are some of recommendations for future studies in relation to fleet safety implementation within the industries and the country at large.

There's need for an in depth study on;

- Other road users behavior on the road and how this impacts the fleets accidents on the roads
- The extent of the actual state of the roads ,the design and how this contributes to road accidents.

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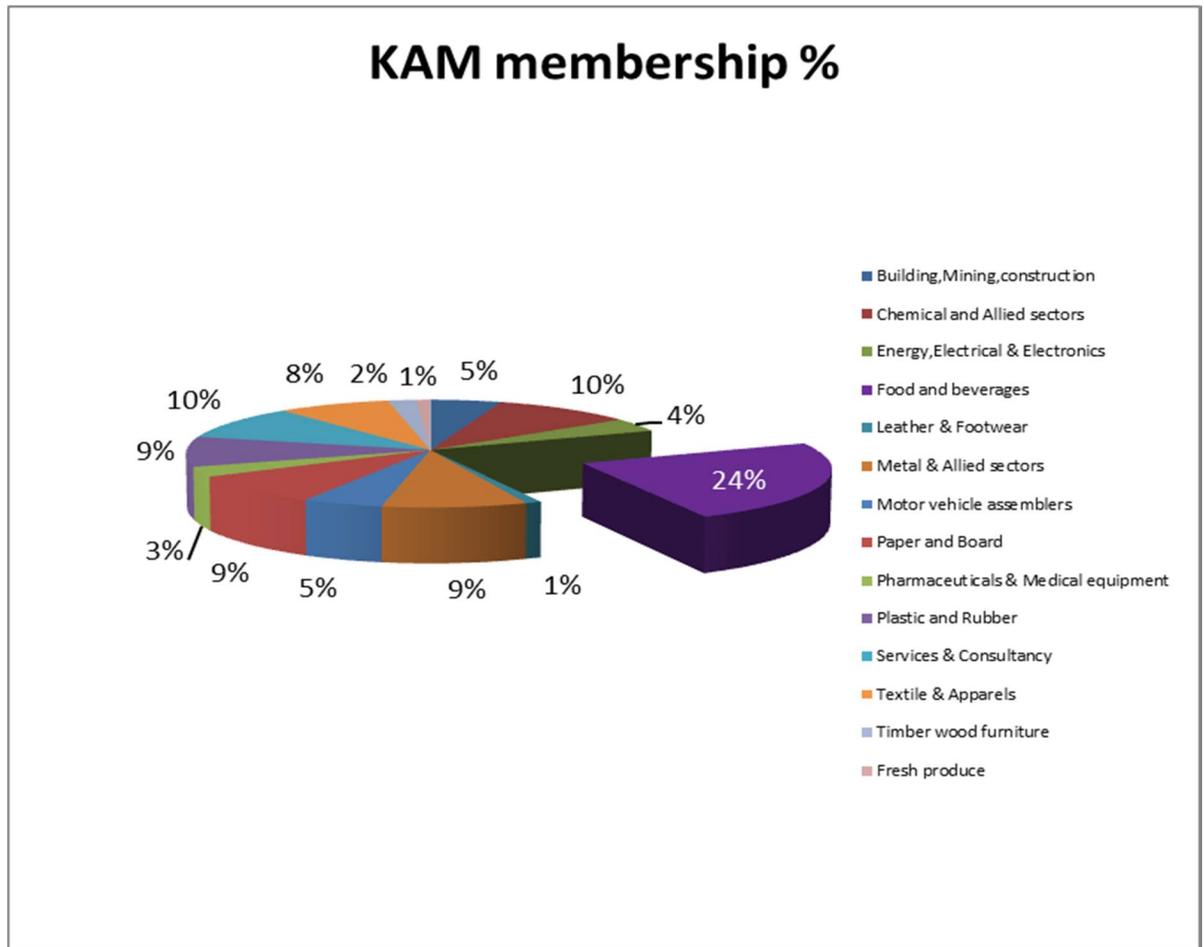
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APPENDICES

Appendix 1; Selected Beverage sector position in the KAM membership



Appendix 2; Sample Questionnaires

A Sample Questionnaire for Managers/Supervisory level

Kindly answer the following questions.

- 1) a) Please indicate the length of your professional experience in fleet safety management by ticking in the box below

Between 0-2 years	<input type="checkbox"/>
Between 3-4 years	<input type="checkbox"/>
Between 5-6 years	<input type="checkbox"/>
Over 6 years	<input type="checkbox"/>

- b) How many fleet accidents on average has your organization registered annually for

the last 5 years?

	201 1	201 2	201 3	201 4	201 5
None	<input type="checkbox"/>				
Between	<input type="checkbox"/>				

1-5 accident s					
Between 6-10 accident s					
Over 10 accident s					

2) Indicate three major causes of fleet accidents in this organization by ticking in the box below;

Driver fatigue	
High speed	
Aggressive driving behaviour	
Intoxication(Alcohol, drugs)	
Defective, hazardous and dangerous roads	
Defective vehicle	

3) Is there a scheduled maintenance record for each truck in this organization?

Yes	
No	

4) How is fleet driving performance of individuals drivers evaluated in this organization?

Top-down performance evaluation method (supervisor's feedback)	
Between 3- 5 Years Peer-to-peer evaluation method (driver-to-driver feedback)	
360-degree performance Reviews (consultative)	
Self-assessment performance reviews (drivers rate themselves)	
Others(Give a short text)	

5) How does your organization deal with company drivers who violate road safety rules?

Are sacked	
Are surcharged (fined)	

Are re-trained	
Are suspended from work	
Are reprimanded and verbally warned	

6) Do you have a fleet safety training program in this organization?

Yes

No

7) If your answer to 6) above is yes, how are the road safety training activities evaluated?

Using level-one evaluation (reaction survey at the end of the training)	
Using level-two evaluation (trainees given a quiz at the end of the training)	
Using level-three evaluation (driver performance appraisal method)	
Using all the above three evaluation methods	
Never evaluated	

8) Have you ever participated in a fleet safety awareness seminar or workshop?

Yes

No

9) In your opinion, how would you rate the management's current contribution to fleet safety awareness in the organization through awareness education?

Very good

Good

Fair

Poor

10) Do you have a 'companywide' fleet safety initiative / program?

Yes

No

11) If your answer to 10) above is yes, mention the key elements in your organization's road safety initiative / program.

12) Is age of the drivers considered during hiring by your organization?

Yes

No

13) If your answer to 12 above is yes, what is the most preferred age bracket?

14) Which gender is more preferred for drivers in your organization?

Questionnaire for Truck Drivers, Truck helpers, Forklift Operators

Kindly answer the following questions.

1) a) Bio data

A. Male	
B. Female	

b) Marital Status

Single	
Married	
Widowed	
Divorced	

2) Level of education

Primary	
Secondary	
Tertiary/College	
University	

3) Terms of Employment

Permanent	
Contract	
Casual	

4) How long have you worked in this company?

Between 0 -3 Years	
Between 4- 5 Years	
Between 6-7 Years	

Over 7 Years	
--------------	--

5) Is recruitment of drivers in this company based on adequate driving experience and competence?

Yes

No

6) Were you given an induction (orientation) course on joining this organization?

Yes

No

7) If your answer to 5) above is yes, which method was used during the training?

On the job training (illustrative)

Off the job training (classroom)

Both methods

8) How long did the course take?

1 day

1 week

1 month

If Longer, please specify period.....

9) After the training, were you taken through an assessment (testing) for driver fitness and competence by an Independent trainer?

Yes

No

10) Would you like to attend future training programs of a similar nature?

Yes

11) After the initial induction (orientation) training, has any other training (such as defensive training) been done?

Yes

No

12) If your answer to 10) above is yes, has the training impacted positively on your driving performance?

Yes

No

13) Is there any road/fleet safety awareness education policy in this organization?

Yes

No

14) If your answer to 13) above is yes, do you have access to this policy?

Yes

No

15) Have you ever participated in a road/fleet Safety Awareness Education Seminar/Workshop?

Yes

No

16) How would you rate the current level of road/fleet safety awareness in the organization?

	Very good
	Good
	Fair
	Poor

17) How would you rate the management's current contribution to road/fleet safety awareness in the organization through awareness education?

Satisfactory	
Fair	
Unsatisfactory	

18) How many hours do you work in a day?

Between 6-8 hours	
Between 9-10 hours	
Between 11-12 hours	

Above 12 hours	
----------------	--

19) Listed below is set of questions that require your views(s). In a scale of 1-5, with 5 being "Strongly Agree" and 1 being "strongly Disagree", how do you rate or view the issue in your opinion?

Aspect	Codes
	1= Strongly Disagree 2= Disagree 3= Neither Agree nor Disagree 4= Agree 5= Strongly Agree
i. When I drive, I have the main responsibility for my safety and the safety of other road users.	
ii. Use of Mobile phone while driving causes distraction leading to a majority of accidents	
iii. If you talk on a cellphone or text while driving, you increase your risk of a collision	
iv. Drunk driving is a major cause of fatal accidents on the roads	
v. Alcohol is a depressant. This means - It slows down how quickly your brain works.	
vi. When going on a long trip, it is the important to - Get plenty of rest before starting out, have balanced diet	
vii. I drink coffee when I'm driving to help me stay	

	awake	
viii.	I Keep windows down to help stay awake when really tired or on a long trip.	
ix.	I consider seatbelts to be uncomfortable	
x.	I never drive without my seatbelt fastened	
xi.	I ensure I put chokes on my trucks wheels before any loading or unloading	

Appendix 3: Consent Letter



JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY

INSTITUTE OF ENERGY AND ENVIRONMENTAL TECHNOLOGY

P.O. BOX 62000, Nairobi, Kenya. Tel: 00671 52751/5271/5221531-4, Fax: 00671 52164. Email: director@iset.jkuat.ac.ke

DATE: 10th December, 2015

The Managing Director,
New KCC Ltd,
P.O. Box 30130, 00100,
Dakar Road
Nairobi



SUBJECT: MILLICENT WANJIRU GIKUNJU- EET32-1801/2014

The above named person is a postgraduate student at the Institute of Energy and Environmental Technology (ISET) in Jomo Kenyatta University of Agriculture and Technology. She is pursuing the Master of Science degree in Occupational Safety and Health and she is currently undertaking her research on *"Study on fleet safety implementation in selected beverage industries in Nairobi County, Kenya"*.

Any assistance given to her will be highly appreciated and the information given thereof shall be treated professionally and shall only be used for the purpose of producing the thesis. The student has undertaken to follow the research ethics as stipulated by the university.

Thank you for your assistance.


PROF. R. KINYUA
DIRECTOR, INSTITUTE OF ENERGY AND ENVIRONMENTAL TECHNOLOGY



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Appendix 4: First Publication

Researchjournali's Journal of Operations Management

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1

Study On Fleet Safety Implementation In Selected Beverage Industries In Nairobi County, Kenya

Millicent Gikunju

*Researcher, Coca-Cola Beverages Africa-Nairobi
Bottlers Limited, P O Box 18034-00500, Nairobi-
Kenya*

Prof. Gatebe

Lecturer and Supervisor, KIRDI, Nairobi Kenya

Mr. C. Mburu

*Lecturer and Supervisor, IEET Dept. JKUAT, P O Box
62000-00200, Kenya*

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