

**ASSESSMENT OF ROAD USER'S AWARENESS ON STRATEGIES FOR
CONTROLLING ROAD TRAFFIC ACCIDENTS: A CASE STUDY OF
KIGOMA- UJJI MUNICIPALITY**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SOCIAL WORK
OF THE OPEN UNIVERSITY OF TANZANIA**

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CERTIFICATION

The undersigned certifies that they have read and hereby recommends for acceptance by Open University of Tanzania a dissertation titled: **“Assessment of Road user’s Awareness on Strategies for Controlling Road Traffic Accidents: A Case Study of Kigoma- Ujiji Municipality”**, in partial fulfillment of the requirements for the degree of Master of Social Work of the Open University of Tanzania.

.....

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.....

Date

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DECLARATION

I, **Shaban Haruna Juma**, do hereby declare to the Open University of Tanzania that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree.

.....

Signature

.....

Date

DEDICATION

This work is dedicated to my wife, Cessilia Shaban of Kigoma, my Children Salma, Shaimy and Shamir for their heartfelt love, care and support throughout my study. There is nothing I can give you in return but may God bless you abundantly.

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ABSTRACT

Road traffic accidents are on the increase in Kigoma, causing injuries, loss of lives and damage of properties. The process of urbanization, the resultant motorization and the recent developments in road infrastructure, more specifically the construction of tarmac roads, are seen to contribute to more road accidents. Therefore the study has endeavored to answer the question as to what extent road users in Kigoma-Ujiji municipality are knowledgeable and aware of road traffic rules. The study poses that knowledge of traffic rules is essential for application of safety measures, which leads to responsible behavior on the road and consequently result in reduction of road traffic accidents. Using a combination of qualitative and quantitative methods, the researcher chose the setting of his study to be Lumumba to Ujiji, Katonga and Mwandiga Roads, both being the heaviest traffic lanes and also the most affected by road accidents. Samples totaling 100 respondents were drawn from 4 major groups of respondents, namely pedestrians and passengers, drivers, and motorists/cyclists, and key informants. Data were collected using questionnaires, interviews and direct observation. Research results show that knowledge of traffic rules varies greatly among respondents by type of road user, with vehicle drivers scoring highest and pedestrians being the least knowledgeable of all. The researcher recommends increasing and diversifying road user education, tailored to specific needs of each group, and enforcement of traffic rules and strengthening with corrective measures, and improvement of road infrastructure through increase of road signs and markings.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
KIBOA	Kigoma Bus Owner Association
KIBOTA	Kigoma Bus Owners & Transporters Association
NBS	National Bureau of Statistics
NCTSS	National Council Of Traffic Safety And Security
RTO	Regional Traffic Officer
SUMATRA	Surface and Marine Transport Regulation Authority
TCD	Traffic Control Devices
TESC	Tanzania Emerging Strategic Cities
URT-MID	United Republic of Tanzania – Ministry of Infrastructure Development
WHO	World Health Organization
RSA	Road Safety Ambassador

CHAPTER ONE

INTRODUCTION

1.1 Background

Road traffic accidents are common hazard threatening the life and well being of everyone each day; and they can happen to anyone anywhere at any time. According to Komba (2006), the problem of road traffic accidents is increasingly becoming a threat to public health and national development in many developing countries. Komba further recognizes that generally road traffic accidents contribute to poverty by causing deaths, injuries, disabilities, grief, and loss of productivity and material damages. The World Health Organization (WHO, 2011) estimates that road accidents account for 1.2 million deaths worldwide every year. According to Gesinde (2010), road accidents are one of the major causes of death and morbidity in African countries.

Road accidents anywhere in the world are always disastrous. They are always associated with loss of lives of healthy and productive citizens as well as property. Working parents killed or injured in traffic accidents leave behind orphaned children, widows and widowers, and families without sufficient sustenance (NCTSS, 2003). Nearly 3,400 people die on the world's roads every day. Tens of millions of people are injured or disabled every year. Children, pedestrians, cyclists and older people are among the most vulnerable of road users (WHO, 2011).

In addition to loss of lives and personal sufferings, road traffic accidents cause unnecessary costs for the funerals, expenditure for medical treatment and care, and

costs of repairing or replacing damaged vehicles. All these resources could be devoted to other important sectors such as education, food production and health. According to Zacharias (2011, 2012) calculations, the total cost of one accident, different factors are taken into account is market losses account for 26 per cent, losses to public property 25 per cent, medical expenses 14 per cent, legal losses 5 per cent and losses to employer 2 per cent. For instance, in Abu Dhabi, car accident deaths fell from 376 in 2010 to 334 last year - a drop of 11.1 per cent. In the UAE, deaths fell from 826 in 2010 to 720 last year, a drop of 12.8 per cent. Emergency medical services 1 per cent, indirect losses due to traffic delays 11 per cent, household losses 9 per cent, insurance administration 7 per cent, legal losses 5 per cent and losses to employer 2 per cent. Road traffic accident rates increase the dependency burden as accidents cause loss of about 3% of GDP in many developing countries.

Globally, road traffic crashes are a leading cause of death by injury. Every year more than 1.2 million people die in road crashes around the world. 65 percent of deaths involve pedestrians - 35% of these, are children. Most people affected by road traffic crashes will never be able to afford a car. These are pedestrians, cyclists and users of public transportation. Road traffic accidents cost Africa US\$ 10 billion a year and remain the second leading cause of death for the 5-44 age-groups around Africa (Hamdok 2012).

According to UN global road safety week (2015) reveal that, around 186 300 children less than 18 years die from road traffic crashes annually, and rates of road traffic death are three times higher in developing countries (AFRICA) than in

developed countries. The Third UN Global Road Safety Week - SaveKidsLives - seeks to highlight the plight of children on the world's roads and generate action to better ensure their safety.

Motor accidents compete with malaria and HIV/ AIDS as major human killers in the region. Tanzania is the most affected than the neighboring Kenya and Uganda due to the increasing car imports and improved roads. In Tanzania, it is estimated that the cost of road accidents per year is about 190billions Tanzania shillings which is equivalent to USD 0.2 billions Aloyce Menda of JUSTA-AFRICA, (2009).

Reports (NCTSS, 2005) indicate that the problem of road accidents was in the increase for the last ten years. In 1994, the total number of accidents that had occurred was 10, 674 while in 2004 it had increase to 17, 039 accidents, an increase of 60%. The report of the 7: 30 breakfast debate – August 31st 2012 on road traffic accidents presented by Palfreman and Ruchyahinduru stated that, the proportion of citizens involved in road accidents each year exceeds the nation's annual population growth. Road accidents have increased by 3.4% since 2007, while road deaths and injuries have increased by an average of 10%.

In Kigoma, we have been continually registering annual increases of fatalities in urban road accidents from 51 in 2010, 75 in 2011, 78 in 2012, in 2013 80 and in 2014 63 a fall. So that we can see the increases in 2013 for 17 % percent compared to 2014 and decreases of fatalities in 2010 (Annual Report of Road Traffic Accidents in Kigoma, 2014). Further reports indicate that over 5000 people were killed by road accidents in 2009, while 32,218 people sustained injuries (Mukiza, 2009).

Four types of factors are cited to contribute to the increase in road accidents in Tanzania. According to Regional Traffic Officials in Kigoma in 2014 these factors caused more accidents: the human factor referring to road user negligence caused 11, and lack of awareness 13, the mechanical factor referring to vehicle defects 10, and the environmental factor referring to the status of roads and road planning 08. However, with the improvement of the quality of roads in the country, environmental factors are found to contribute only 8%, while mechanical factors account for 16% of road accidents (The Guardian, 19 Sept. 2012). A study in Dar es Salaam city only found that over 65% of road accidents involve pedestrians and are linked to people who are ignorant of traffic laws and driving (Menda, 2009). Thus, the human factor is considered to account for the majority of road accidents in Tanzania because most of the accidents are caused by human errors, like intoxication. In Kigoma Municipality, intoxication has contributed accidents as follows: drivers 1, motor cyclists 5, pedal cyclists 2, pedestrian 1.

Since the year 2000, Tanzania is pacing fast through urbanization and technological advances, making roads and traffic a very complex matter, especially for local road users. Due to programs such as the Tanzania Emerging Strategic Cities (TESC) started in 2010 towns like Kigoma are growing very rapidly with expansion of services and infrastructures, and mostly the roads and traffic. We have also witnessed a spurt in importation of motor vehicles; Bajaj's and motorcycles, including three wheelers commonly known as Bajaj for public transport in urban settings. The Table 1.1 shows the trend in importation of motor vehicles by comparing vehicle imports in the year 2009 and 2011:

Table 1.1: Trend in Importation of Motor Vehicles and Motorcycles

Type	2009	2011	% of Increase
Motor vehicle	147,499	561,190	280
Motorcycle	85,702	330,882	286
Three wheeler	2,124	9,532	349

Source: National Traffic Commander, (2012)

The Government of Tanzania has put in place several measures and programs for implementation of road safety initiatives. Several ministries in the country are involved in road safety work at different levels, addressing one or more of the four factors of road accidents. The Ministry of Works is responsible for road and traffic planning, engineering and infrastructure development; the Ministry of Communication and Transport is responsible for licensing of vehicles; the Ministry of Home Affairs enforces vehicle testing, issues driver licenses and records accidents; the Ministry of Health is responsible for treating the injured; the Ministry of Information manages public awareness; and the Ministry of Education oversees driver training and road safety curricula in schools.

Despite this huge arsenal of ministries, programs and regulations road accidents are found to be on the increase as shown earlier; which is an indication that not enough is being done to address the major cause of road accidents: the human factor. This research is an effort to look into the aspect of road user awareness, a human factor in the control of road accidents.

1.2 Statement of the Problem

The National Road Safety Policy (URT-MID, 2009) highlights a comprehensive strategy to curb road crashes comprising 5 E concepts that refer to: Engineering and

traffic environment; Education and Information; Enforcement and Legislation; Emergency Response and victim support; and Evaluation and other comprehensive actions. However, the same policy further recognizes that traffic rules and regulations are not observed in practice due to lack of knowledge among the population at large (URT-MID, 2009:34).

Even though the Road Traffic Act (2007) requires pedestrians on a public road to conduct themselves in a safe and responsible manner, lack of awareness of road safety rules among various road users leads to unsafe road user behavior and habits. Traffic accident data show that passengers, pedestrians, motorists and cyclists are particularly vulnerable and are involved in a large number of crashes. In one of his speeches, President Kikwete reported that of the 15,499 accidents that occurred in 2012, 33% involved pedestrians, 29% passengers, 16% motorists and 14% bicycle riders (The Guardian, 19 Sept. 2012). Errors play an important role in most road traffic accidents. Such errors are from drivers, pedestrians or other road users. Indications of lack of awareness of road use include bad road use behavior and non-respect of traffic safety rules by various road users.

Therefore, in order to improve road safety, we must in the first instance increase the knowledge and modify the attitude and behavior of the road users. However, it is evident that we lack accurate data as to what extent the people are ignorant, or to what degree lack of awareness contributes to road traffic accidents. The curiosity of this study is to try to find out to what extent the road users in Kigoma-Ujiji municipality are aware of road safety, knowledge of which would contribute to furthering the implementation of road safety at regional or national levels.

1.3 Objectives

1.3.1 The General Objective

To assess awareness of the road users on road traffic rules and related end-use practices and options in Kigoma-Ujiji Municipality.

1.3.2 Specific Objectives

- (i) To assess the knowledge of road users on essential road traffic rules and end-user options;
- (ii) To assess the ability of different road users to observe safety rules while on the road;
- (iii) To find out key gaps in public awareness of traffic rules and regulations.

1.4 Research Questions

This research was guided by the following specific questions:

- (i) What are the main road traffic rules for all commuters

Variables:

- (a) General traffic rules on the road;
- (b) Rules for pedestrians
- (c) Rules for drivers (vehicles, motorcycles, three wheelers)

- (ii) What safety options and responsible behavior do different road users practice while on the road?

Variables:

- (a) General safety options

- (b) Road signs and traffic structure
- (c) Observance of rules and regulations

- (iii) Which groups among the different road users are more knowledgeable /aware of safety rules and road traffic options than others?

Variables:

- (a) Drivers,
- (b) Pedestrians
- (c) Motorcyclists/ bicycle drivers.

1.5 Scope of the Study

The setting of this study was in Kigoma-Ujiji municipality, more particularly on Lumumba road (from Kigoma railway station to Ujiji) and on Kasulu road (from Mwanga to Mwandiga). Over the past 5 years, the municipality has registered a considerable number of traffic accidents. Despite having one main road, the municipality has recently witnessed the construction of new tarmac roads and the expansion of its road network. Road infrastructure development and the change in the town status as an “emerging town”, go in hand with rapid increase in daily traffic volumes, which increase incidence of road accidents as shown by statistics.

The study has focused on road user, awareness on traffic rules and safety use. The researcher has focused on the general rules that guide road user behavior on the road and the measures for safety, as they should be applied by the different categories of road users. More specifically, the study has focused on drivers, including public and

private vehicle drivers, motorcycle driver's three wheelers drivers, and the pedestrians.

1.6 Significance of the Study

This research may be providing important contribution to the efforts of reducing road traffic accidents in the country. It is expected to set the tone for more research on the contribution of the human factor, and more specifically the importance of education and information giving, in reducing the incidence and effects of road traffic accidents. The research may further shed light on how much has been done or not done to create awareness of traffic rules and regulations and safety measures among the road user public., as well as reveal on the policy level, this responsible behavior on the road.

The research will inform the public, government and traffic stakeholders about the severity of the traffic information gaps among road users, and hence appeal for more efforts that can help increase research.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Conceptual Framework

This chapter discusses the existing knowledge and theories about the topic under study by shedding a critical look at some relevant articles and publications, most of which range within the last six years of publication. A purposeful literature search was conducted Google scholar and WHO online resources. Also relevant traffic police literature and reports, as well as those of other relevant bodies and agencies, namely SUMATRA and KIBOA in Kigoma were consulted. The chapter employs a combination of theoretical and practical reviews (Justus, 2009) as it discusses the existing knowledge about youth groupings and gangs, and their relationship to youth psychosocial development in specific contexts. The chapter ends with a summary of the discussions highlighting the major research gaps in the matter.

Literature in the traffic profession indicates that there are several factors that can help reduce the incidence of road accidents and consequent fatalities and casualties. The concept of this research is that increased awareness of traffic rules and regulations as well as awareness of safety measures do increase responsible behavior among different road users, and hence contribute to reduction of road accidents, fatalities and casualties. This implies that mechanical, environmental and managerial factors to road accidents do find full meaning when, and only when they are paired with positive attitude that is shown by responsible behavior of road users while using the road. Knowledge, information and awareness are key to building responsible

behavior of road users. Research indicates that around 35% of all traffic-related deaths and injuries worldwide involve crashes between vehicles and pedestrians (Madely et al., 2002).

While there is a considerable body of literature that recognizes the importance of the human factor in causing road accidents and traffic safety, there has been a tendency to focus on driver behavior only. The concept of this study has given a considerable importance to other factors of human factor, especially the pedestrians and passengers. Mwaipopo (2006) refers to knowledge and awareness as determinants of responsible behavior for drivers, and de facto for other road users. The chart below (Figure 2.1) illustrates the relationship between the major variables as seen from the perspective of this study.

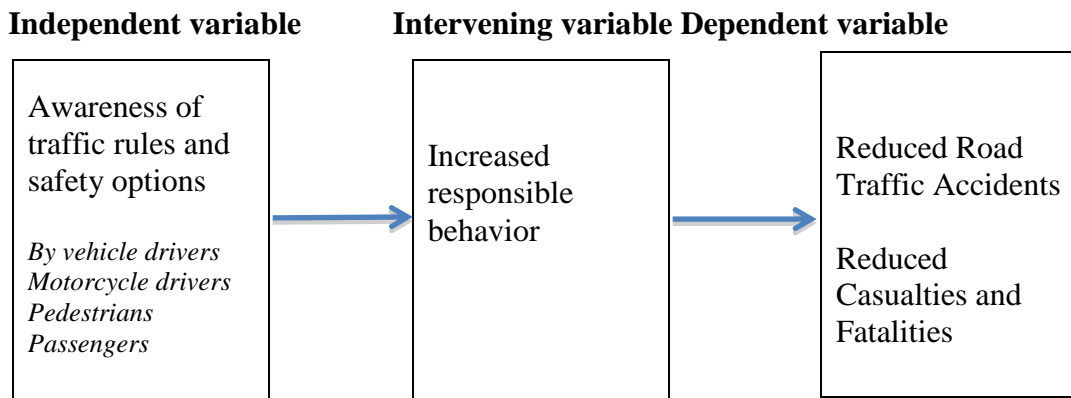


Figure 2.1: Conceptual Framework

Source: Current study

This conceptual chart shows that knowledge of traffic rules and safety options by various road users strengthens responsible and safe behavior on the road, which results in reduction of road traffic accidents as well as decrease in injuries and fatal outcomes after accidents.

2.2 Defining Key Concepts

2.2.1 **A road traffic accident** has been defined as a “*rare, random, multifactor event always preceded by a situation in which one or more persons have failed to cope with their environment*” (SUMATRA, 2007).

2.2.2 **Road user:** This term is used to refer to any person using the road, including those walking, cycling, riding motorized equipment or driving a vehicle. For the sake of this study, the term shall be used exclusively to refer to human beings, including pedestrians, cyclists, motorists, and drivers.

2.2.3 **Road traffic:** According to the free dictionary, it is the movement of people vehicle or parking in a particular place or for a particular purpose.

2.2.4 **Human factor:** This term is used to refer to causes of road traffic accidents that arise from the human error or human behavior.

2.2.5 **Safety options** (also referred to in this report as end-user safety option):

2.3 Empirical Literature Review

2.3.1 The Toll of Road Accidents

The World Health Organization estimates that about 1.24 million deaths occurred on the world's roads in the year 2010, a situation it considers unacceptable. It also reports that 50% of fatalities are vulnerable road users (23% motorcyclists, 22% pedestrians, 5% cyclists). The same report indicates that the African Region has the highest road fatality rates of all the world's regions. Young men are the most vulnerable road users. Despite significant variations among countries, in the African region, vulnerable road users – pedestrians, cyclists and motorized 2- and 3-wheelers

– constitute more than half (52%) of road users killed on the roads, with pedestrians alone being 37% (WHO, 2013).

A study by Menda (2009) indicates that 65% of road traffic accidents in Dar es Salaam city involved pedestrians, most of which were found to be caused by people who are ignorant of traffic laws and driving. In 2008, a report on road safety showed that about 79% of road accidents were caused by road users (Ruchyahinduru, 2012). The Tanzania National Bureau of Statistics, under the Ministry of Finance, recorded a total of 22,019 road traffic accidents in the year 2009 only, of which 20,717 people were injured and 3,851 killed (NBS, 2009).

The same source recognizes that there has been an increase in number of people who lost their lives and injured in road accidents (NBS, 2009). A statement by the WHO indicates that road safety is not an accident, and that road accidents don't just happen. Road traffic accidents happen when basic principles in the interplay between vehicle and men are violated on the road (Bantu, 2001).

WHO statistics indicate that the road traffic death rate for Tanzania is 22.7 per 100,000 inhabitants (WHO, 2013). Such a rate is almost twice the rate in the US (11.4), and a little less than in neighboring Uganda (28.9). In Tanzania, the proportion of citizens involved in road accidents each year has been found to exceed the nation's annual population growth where 3.4 % of the Tanzania's GDP is lost due to traffic accidents each year. Since 2007 the problem is increasing as road deaths and injuries have increased by an average of 10% (Palfreman, 2013).

2.3.2 Contributory Factors to Road Accidents

Road traffic can be seen as a system in which the components are constantly interacting with each other (SUMATRA, 2007). The system comprises 3 main components:

The human as road users. Road users are those people like pedestrian, animals, drivers of motorcycles, three wheels known as Bajaj's, motorcyclists. The vehicle, I mean all types of mobile that use road. Such as tax, daladala (Hiace), lorries and Busses and the road environment including the operating rules and Traffic Control Devices (TCD).

By adopting a systematic approach to the identification of contributory factors to road traffic accidents and development of safety measures we recognize that road traffic accident is an event with multi-factor causes. Under this approach, when there is a breakdown in the interaction of the components, a "system failure" or a road traffic accident is the result (SUMATRA, 2007). The National Road Safety Policy (URT, 2009) recognizes that:

"Personnel behaviour of road users are the dominant causes of accident i.e. short falls in human behaviour and particularly driver is the main cause of road crashes in Tanzania."

According to the same source, police records show that in the year 2006, inappropriate human behaviour accounted for 80% of 17,039 road crashes reported to the police. The problem of road user behavior in these cases has been associated with low level of education, among others.

Traffic literature further mentions five risk factors associated with road traffic accidents, namely:

- (i) Speed,
- (ii) Seat belts,
- (iii) Child restraint systems,
- (iv) Drink-driving and
- (v) Motorcycle helmets.

Research has shown that the majority of road crashes or collisions are caused by human factors (Kikoye, 2013). For instance, driver error was found to account for over 80% of all crashes on Irish roads, and more specifically reckless driving, speeding, overtaking, drink driving and non-wearing of seat-belts.

2.3.3 Road user Behavior and Road Safety

Every day drivers, passengers, and other road users die in road accidents. It is mostly the passengers and pedestrians who die in most road accidents. In their study, Manna et al. (2013) highlighted the interaction of several factors involved in the occurrence of road traffic accidents, including low awareness about the safety measures, lack of experience of drivers, and high speed.

According to Kikoye (2013), most the accidents caused to the pedestrians in Dar es Salaam are due to the fact that their pavements are being taken away. If drivers apply simple traffic rules such as parking considerately, leaving generous space for pedestrians to walk around their car, stopping for pedestrians at intersections, leaving space for cyclists on the sides of the road, driving at controlled speeds rather than

speeding and overtaking, many accidents can be avoided. Komba (2006) observed that the behavior of road users (pedestrians, passengers and drivers) requires a guidance and control for appropriate interaction with other components of the road. This is because researchers in Tanzania have concluded that human error constitutes over 80% of all road accidents and only small proportion of accidents can be directly attributed to: vehicle performance including defects or faults, and roads themselves including their design or maintenance. Traffic literature indicates that there are general road traffic rules but also specific expectation from the behavior of different road users, just as there are traffic rules, signs and measures specific to each type of road user. It is important in this review to highlight the most salient concerns related to the safety and road use behaviors of different road users.

2.3.4 Drivers: Bad driving habits

There are a number of things that other drivers do more frequently that can be extremely dangerous and thus cause accidents. Bad Tailgating, poor lane discipline, not indicating and undertaking are just a few of them. According to RTO Kigoma (2013), such habits can be very irritating and annoying to other drivers and road users.

(i) Tailgating

Drivers often condemn tailgating as one of the greatest problems linked to driver behaviour. Some drivers are extremely impatient, some do it without thinking, just following traffic they get a bit close, but then they back off as you accelerate away. Some drivers tailgate deliberately though and these are the ones that are the most dangerous. They sit behind you flashing their headlights in an effort to move you, but of course there is nowhere to go as you are in the process of overtaking and

there is no room to pull in on the left. To this kind of driver, the two second rule means that they can just about cope with another vehicle in front of them before they decide to intimidate them by driving inches away.

Undertaking: -Tailgaters that do not get their way will often resort to undertaking if they can. Yes, there are also those selfish individuals out there that hog the middle and the outside lane. They have no idea that there is a queue of traffic waiting to get past them, probably because they are in their own little world thinking about what to have for dinner. This causes some individuals to lose patience and undertake.

(i) Poor lane discipline

Some drivers are all over the place and they don't seem to realise that they are supposed to stay in between those white dashed lines.

(ii) Indicators

Some people have no idea what these pretty orange flashing lights are actually for! They move here and there and go wherever they please without any thought of letting the rest of the road users know what their intentions are. Some other driver behaviours that can be linked to road accidents include the following:

- (a) Cutting corners abruptly, particularly at junctions;
- (b) No headlights in conditions that require them;
- (c) Throwing cigarettes out the window;
- (d) Leaving main beam on, or dipping only at the last minute;
- (e) Inappropriate use of the horn;
- (f) Impatient people pushing in ahead of a queue of traffic.

(iii) Speeding

Speed is often singled as biggest factor contributing to road accidents in the world. Speed has been identified as a key risk factor in road traffic injuries, influencing both the risk of a road crash as well as the severity of the injuries that result from crashes. Over 40% of fatal collisions are caused by excessive or inappropriate speed. A 5km/h difference in speed could be the difference between life and death for a vulnerable road user like a pedestrian. For instance, it has been ascertained that, hitting by a car at 30km/h, 1 out of 10 pedestrians will be killed, and hitting by a car at 50km/h, 5 out of 10 pedestrians will be killed, while hitting by a car at 60km/h, 9 out of 10 pedestrians will be killed.

Excess speed is defined as exceeding the speed limit. Inappropriate speed is defined as driving at a speed unsuitable for the prevailing road and traffic conditions. Excess and inappropriate speeds are responsible for a high proportion of the mortality and morbidity that result from road crashes. Controlling vehicle speed can prevent crashes happening and can reduce the impact when they do occur, lessening the severity of injuries sustained by the victims. Roads in towns and cities are usually shared by pedestrians, cyclists, other users of public transport as well as higher speed traffic.

It is established that while 50km/h is considered best practice for urban speed limits, there is much evidence to support reducing these limits to 30 km/h as a way of traffic calming in areas with high pedestrian concentration (WHO, 2013). Being a good driver is not just about the ability to control a car and having good reflexes, it is also

about attitude and being able to spot and understand dangers on the road. The following are pieces of advice for safe behaviour in the road:

- (i) Watch your speed
- (ii) Expect to encounter different road users
- (iii) Be patient
- (iv) Give others time and room
- (v) Be ready for others to make mistakes
- (vi) Concentrate on your driving
- (vii) Never drive and use a mobile phone – it can distract and loosen your concentration
- (viii) Never drive while drunk,

Komba's research in Kibaha District (2006) found that driving while using cell phone is one of the human behaviour factors contributing to the cause of road traffic accidents. According to a social security officer (Komba, 2006) "*A hand –held cellular phone is used in a variety of circumstances by road users in Kibaha district, while walking down the street (pedestrians) or operating motor vehicle.*"

The various tasks entailed in using a cellular phone each require a different amount of time, mental energy, and coordination, leading to potentially different complications of the driving task and resulting risk of collision. Interviews with accident victims often reveal that their accidents were caused by the drivers when using the mobile phone just before the accident. As the driver concentrates on the cellular phones, accident victims notice unstable movements of the vehicle before a crash or collision to another vehicle happens.

3.2.5 Pedestrians' Inappropriate Behavior

Pedestrian deaths account for 1 in 5 deaths on Great Britain's roads. Walking is an every day activity for most people worldwide. Walking, even for leisure or sport, involves mixing with other pedestrians, cyclists, cart pushers, motorists and drivers. Pedestrians need to behave responsibly, exercise care and not endanger themselves or inconvenience other users of the road when walking. Appropriate behaviour for pedestrians on the road involves, among other things, being able to stop, look and listen before engaging in crossing the road.

Passengers and pedestrians were found to be the most vulnerable road users in Kibaha district (Komba, 2006). The same applies in Kigoma Municipality, passengers for the year 2013 were injured 72, pedestrians were 34, and death passengers were 13, pedestrians were 0 in 2014 passengers were 27, pedestrians were 16, death passengers were 9, pedestrians were 0. Unguided pedestrians increase the risk of accidents to occur by causing confusion and misleading other road users, their movement towards the use of the road remains inconsistent while they are unprotected.

Pedestrians behavior can be widely variant quite inconsistent, difficult to control and is linked to many other related and unrelated factors. Lack of traffic safety education is one of the factors affecting the behavior of pedestrians in risk taking behavior towards road traffic accidents. It is very common to pedestrians crossing the road without paying proper attention to the vehicular traffic in Kibaha, and this shows that their behaviors in using the road is also one of the risk factors contributing to traffic accidents.

(i) Walking beside or along a road

In Kigoma Municipality in 2013 pedestrian injured were 34 and in 2014 were 16, many pedestrians, especially children do not know the right side of the road to walk on. Uneducated pedestrians may not know that they must use the footpath if there is one, that they must walk as near as possible to the right hand side of the road facing the oncoming traffic; that they should not walk more than two abreast, especially if the road is narrow or carries heavy traffic, and that they should instead walk in single file. May drivers when referring to pedestrians mention the issue of visibility; especially at night or when the weather is not clear enough, pedestrians need to take on measures that ensure they are safe to use the road.

In a study on road accidents involving a pedestrian and since vehicle in the UK in 2002 (Modedale et al., 2004), it was ascertained that over 90% precipitating factors in such accidents were assigned to the pedestrian mainly as *pedestrian entered the road without looking properly*. Factors in about a third of these accidents related to carelessness and inattention (18%) and a failure to look before crossing (38%), or looking but not being able to see (13%), most likely as the pedestrian tried to cross from behind a parked vehicle (31%).

(ii) Crossing the road

There are simple but essential measures that guarantee safety for pedestrians as lay down by road safety literatures. Unfortunately, most road users do not know these tips. We may consider the following as an illustration:

- (a) Look for a safe place to cross.

- (b) Stop and wait near the edge of the road.
- (c) Look right and left and listen for traffic.
- (d) Let any traffic travelling in each direction pass and then look right and left again.
- (e) Quickly walk across the road when it is clear.
- (f) While crossing continue to watch and listen for traffic coming.
- (g) Don't cross at a corner or bend in the road.
- (h) Don't cross near or at parked vehicles.
- (i) Don't run across the road.

(iii) Zebra Crossing

This is a safe crossing place for pedestrians. The place is marked by yellow flashing beacons or signs, while the actual crossing area is marked by black and white zebra stripes. There are rules that guide the use of zebra crossing places for both drivers and pedestrians. For instance, it is expected that drivers must let pedestrians cross. As they approach the crossing, drivers should slow down and be prepared to stop. But there are rules for pedestrians as well, which they should know and observe.

For instance, a pedestrian does not have the right of way (or priority) over other traffic until he/she actually steps on the zebra crossing. A pedestrian should actually refrain from stepping onto a zebra crossing if doing so would cause a driver to break or swerve suddenly. Pedestrians should also watch carefully for approaching traffic, always before stepping in, and it is recommended to place one foot on the crossing to indicate that one wishes to cross.

Appropriate behaviour by both drivers and pedestrians interacting at zebra crossing can help to avoid unnecessary crashes or accidents. Fortunately, the roads in Kigoma are still not yet too complex as they have no traffic lights, and other high traffic signals and mechanisms. Where such mechanisms exist, there is more pressure on pedestrians and drivers' behaviour.

3.2.6 Motorists and Cyclists: Like drivers

While cycling can a great way for people to get around and keep fit at the same time, it's important to be wary of safety while cycling on the road. In much of the African Region, for example, walking and cycling are important forms of mobility for a large proportion of the population (WHO, 2013). But like pedestrians, two-wheeled motorists and cyclists are among the vulnerable population in the case of road accidents. It is estimated that half of the world's road traffic deaths occur among motorcyclists-23%, pedestrians-22% and cyclists-5% (WHO, 2013).

In the UK, about 3/4 of the two vehicle accidents involving a car and a motorcycle were found to take place on urban roads in 2002. In 39% of those accidents, the precipitating factor was assigned to the two-wheeled motor vehicle; and in all those cases the precipitating factor was attributed to excessive speed -26%, lack of judgment of own path-24%, inexperienced driving-17%, inattention-13% and reckless/careless behavior-10% (Mosedale et al., 2004).

Most motorists, and all cyclists in Kigoma, like in all other parts of Tanzania, ride without formal training, and less so without education on road safety. Training of motorists and cyclists can increase safety and help reduce congestion on the road.

Like pedestrians, cyclists are vulnerable to road accidents. Traffic rules require cycle riders to behave in the same manner as motorists and drivers; they should obey the road rules. For instance, cyclists are not expected to ride on the wrong side of the road or coast through red lights. Other measures such as related to turning, overtaking, speeding, etc. are required to ensure that cyclists do not expose themselves or other road users to danger.

An important aspect of safety for cyclists on the road is visibility. Traffic literature mention a number of suggestions that may enhance cyclist's safety, including:

- (i) Wearing brightly or fluorescent coloured clothing;
- (ii) Have lights fitted to the bike, front and back, especially for night riding.
- (iii) Reflective garments, including reflectors fitted to the back of the rider's shoes.

2.3.7 Strategies to Curb Road Accidents

Because most traffic accidents are the product of several factors, the probability of accidents can be reduced in a number of different ways. The WHO (2013) reports that:

“Only 28 countries, covering 7% of the world's population, have comprehensive road safety laws on five key risk factors: drinking and driving, speeding, and failing to use motorcycle helmets, seat-belts, and child restraints.” The same report further indicates, *“Over a third of road traffic deaths in low- and middle-income countries are among pedestrians and cyclists. However, less than 35% of low- and middle-income countries have policies in place to protect these road users.”*

Therefore, it gives recommendations to curb the increasing toll of road traffic accidents that focus on three strategic areas:

- (i) The institution of comprehensive legislations that meets best practice on all key risk factors;
- (ii) The investment of financial and human resources in the enforcement of these laws, with a component of raising public awareness on increasing understanding of and support for such legislative and enforcement measures.
- (iii) Putting in place efforts to make road infrastructure safer for pedestrians and cyclists.

Rapid economic development is being observed in many low- and middle-income countries, including Tanzania, resulting in rapid urbanization and increased motorization. The increasing number of motorized vehicles makes roads more dangerous for those road users who use alternative modes of transport including those who walk, cycle and use motorcycles. Action is needed in terms of effective policies and programs to make vehicles safer for non-car road users.

The WHO (2013) recommends: *“In the context of rapid global motorization, governments must work to increase safety and mobility for all road users, especially those most at risk.”*

Overall, the following three main strategies have been proved to prevented the increase in accidents:

1. Education and training of (a) children in school by road-traffic instructors and school teachers; and of (b) adolescents in the principles of safe driving and in good driving attitudes; by (c) refresher courses for older drivers to bring

home safe-driving principles and to refresh their knowledge of traffic law; and by means of (d) newspaper, radio television, and other publicity, to draw the attention of all road users both to dangers and to safe practices on the road.

2. Enforcement by (a) adopting reasonable and enforceable traffic laws which, at the same time, are best designed to prevent accidents; (b) concentrating the time and energy of traffic officers on the offences, locations, and times that feature frequently in accidents; and (c) thoroughly testing new drivers to ensure they will not be liable to cause accidents.
3. Engineering of vehicles and roads: Vehicle engineering, comprising (a) regular inspection for a “warrant of fitness” to ensure that the main components of the vehicle are safe; (b) improving the design of the vehicle to give ease of vision and control to the driver and so reduce the likelihood of injury in an accident; (c) fitting safety equipment, such as seat belts.

Speaking at the launch of the National Road Safety Week on September 17, 2012 President Kikwete of Tanzania spelled out measures for controlling road accidents in the country, including the following:

- (i) To use a point system on drivers' licence so as to ban drivers found to be repetitively causing accidents;
- (ii) Update road traffic laws and regulations so they match current developments;
- (iii) Reinforce the traffic police section and the police force in general to enable them curb crime, including road accidents;
- (iv) Promote public education and awareness on the impacts of road accidents

- (v) To provide education to drivers, police and other road users; educate truck and bus owners on their role in ending road traffic accidents; and
- (vi) Enforcement of standards and signs are in place and roads are regularly maintained; mandatory vehicle inspection by traffic police to ensure that only roadworthy ones on the roads.

Road or traffic engineering comprises (a) the design of new roads which are inherently safe (separating opposing traffic flows, eliminating cross traffic, and providing wide shoulders and traffic lanes and good visibility); (b) Improving existing roads by realignment, improving vision, and resurfacing slippery surfaces; (c) Regulating traffic movement by installing traffic signals, traffic islands, road markings, and regulatory signs such as “stop” and “give way” signs; and (d) assisting the driver with warning and destination signs to avoid danger and confusion.

Driver training is another factor in addressing road traffic accidents. Driving is a complex activity that involves factors associated with the driver, vehicle, road and traffic environment. Traffic accident survey in different places tends to show that human factors specifically driver error are the most prevalent contributory factors in traffic accidents. Driver education/training is a sensible alternative to trial and error learning that many young drivers apply, especially given that errors can have such profound negative consequences such as resulting in vehicle crashes and collisions on the road. Driver instruction must have as principal goal to produce safer drivers. In other words, it is assumed that drivers exposed to formal instruction should have lower crash rates than those who learn to drive informally (Komba, 2006). All in all,

Tanzania as a country has adopted a 5 E's strategy (URT, 2009) for reduction and prevention of road accidents, involving:

- (i) Engineering and traffic environment;
- (ii) Education and information;
- (iii) Enforcement and legislation;
- (iv) Emergency response;
- (v) Evaluation and other comprehensive actions.

2.3.8 Who Is Responsible for Road Safety?

Everyone is responsible for driving, walking, and biking safely on the roads. The engineers and planners have the responsibility to make sure that roads are designed and operating properly, bearing in mind the safety of all road users. Drivers and pedestrians have the responsibility to always be alert and obey the traffic rules. Passengers should always buckle up and act responsibly. The government has the responsibility to make sure that the traffic and pedestrian laws are known and effectively enforced. Public safety agencies have the responsibility of responding to and securing crash locations and enforcing traffic laws. Local communities and county and state governments need to allocate funding for safe roads and increase public awareness about road safety. Everyone should take responsibility for roadway safety.

However, it is indispensable for countries to have a lead agency for road safety, which should have the authority to make decisions, manage resources and coordinate efforts of all participating governmental sectors. Such a lead agency may take the

form of a designated stand-alone bureau, or a committee or cabinet representing several different government agencies (WHO, 2013).

2.4 Summary of Literature Review and Key Research Gaps

This review of literature has revealed that the toll of road traffic accidents is high and very costly in Tanzania, just like in other low- and middle-income countries. Road traffic accidents were found to affect mostly vulnerable users including pedestrians, cyclists and motorists. The rapid economic expansion that most developing countries experience results in spurt of two-wheeled motorcycles in emerging urban areas, with dire consequences on road traffic safety. The rapid increase in motorized transport means, the growth of urban populations, the new developments of road infrastructures and other contextual factors increase risk for road users.

However, the most important factors for road traffic accidents remain those related to human behavior. The behavior of drivers, motorists and cyclists, as well as that of pedestrians has been blamed to account for the largest proportion of road accidents. This means, any efforts to control road traffic accidents must be primarily directed at improving the human factors among different road users. Unfortunately, the data have shown that this is not always the case. Most strategies at national levels have not put enough emphasis on increasing road user knowledge on road safety rules and options, or enhancing responsible behaviors on the road.

While it is established that pedestrians, cyclists and motorists are the largest victims of road accidents, and de facto the most at risk groups, the literature could not ascertain how much effort has been put in place targeting these groups with measures

that address their vulnerabilities. The contribution of this research is therefore to be seen in the sense that it will attempt to shed a light on the level of awareness of essential road safety rules and options, as a predicament of the education received on road traffic rules and measures.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter concerning the methods that were used for collecting information in the field. The chapter is about how this study was conducted, the applied methods and techniques in data collection and the reasons as why they were used according to the research aims and main objectives of the study. According to Webster (1985), to research is to search or investigate exhaustively. It is a carefully or diligent search studious inquiry or examination especially investigation or experimentation aimed at the discovery and interpretation of facts revision of accepted theories or laws. Also can be the collection of information about a particular subject. The chapter will involve the discussion of the research process, the selection of the data site. Sampling methods and sources of data used in the study. This chapter will involve the discussion, data selection.

3.2 Selection of the Study Area and Population

3.2.1 Study Area

Kigoma region is located on the shores of Lake Tanganyika at the North - West corner of Tanzania. The region is located at the far West of the country, situated at longitudes 29.5° and 31.5° East and latitudes 3.5° and 6.5° South of the Equator. The region shares boundaries with Burundi and Kagera region to the North, the DR Congo to the West, Tabora and Shinyanga regions to the East, and Katavi region to the South.

The setting of this study was in Kigoma-Ujiji Municipality. It has focused on the main tarmac road of Lumumba Street at Mwanga and town areas, and on Kasulu road at Gungu and Mwandiga junction areas. Both roads are the major traffic lanes characterized by high traffic activity for vehicles, two wheelers and three wheelers motorcycles, pedestrians and other road users. These lanes are also associated with most traffic accidents, especially at the targeted areas.

3.2.2 Population

Kigoma Region is one of Tanzania's 30 administrative regions. The regional capital is the city of Kigoma. According to the 2012 National Census, the region had a population of 2,127,930, which was higher than the pre-census projection of 1,971,332. For 2002-2012, the region's 2.4 percent average annual population growth rate was tied for the fourteenth highest in the country. It was also the sixteenth most densely populated region with 57 people per square kilometer. Therefore Kigoma-Ujiji Municipality has a population of 427,024 people who live in Kigoma urban district.

The study population included in the study was all people found on the road on the days of the study. This population included people using the road by various means including drivers and passengers using vehicles, motorcycles, three wheelers known as Bajaj's and pedestrians. The total number of transport vehicle in Kigoma municipality that registered is as follows: - Hiace (daladala) are 500, taxi cab are 1050. Bajaj's are 108 and motorcycle are 1200. The total numbers of pupils are 200 and their teachers are 20. The numbers of Traffic Police are 40 in Kigoma Municipality RTO (2015).

3.3 Sampling Design

3.3.1 Sampling Frame

A complete list of public transport vehicles was obtained from the office of KIBOA and KIBOTA, comprising a total of 157 registered public transport vehicles. This list formed sampling frame to obtain driver respondents for the study. This list also provided the basis for categorization of the vehicles by daily rosters, which helped in the process of stratification of the sampling procedure. Also lists of Bajaj's obtained were 108, and motorcycles comprised a total number of 1200. Similar sampling frames could not be established for the other sampling units, namely the pedestrians, the passengers, students, 10 other official officers from SUMATRA and TANROAD and 05 Police officers were involved.

3.3.2 Sampling Units

The sampling units in this study were the people found on the road at the specified study settings on the days of study. These included vehicle drivers, vehicle passengers, motorcycle riders including three wheelers known as Bajaj's, and pedestrians. Also including pupils, student, teachers and traffic police.

3.3.3 Sample Size

$$n = \frac{N}{1 + N(e)^2}$$
 Where: n=Sample size: N=Total population of household of the twelve villages an acceptable error, $e = 0.1$ (the estimate taken to be within 10%

of the true value). Applying the formula; $n = \frac{427024}{1 + 427024(0.1)^2} = 9998 = 10000$

N = 427024

Therefore a minimum of 100 is an acceptable sample size. For drivers a sample of 60 was selected from the group of drivers only, based on a daily roster of 75 drivers; while the other 90 units were solicited from other sample groups as follows: 40 pedestrians, 30 motorists, 5 cyclists, 5 passengers and 10 key informants from SUMATRA, Regional Traffic Office and KIBOTA.

Sample size for the drivers was determined by application of Krejcie & Morgan (1970) sampling formula, whereby at least 59 units must be sampled from a population of 75. Sample size is critical because it provides a basis for the estimation of sampling error (Hair, Anderson, Tatham, & Black, 1995).

According to this same source, a sample size of at least 100 is recommended to conduct a confirmatory factor analysis because a sample less than 100 may not provide enough statistical power to reject the null hypothesis. The reasons as why I conducted this sample size is to get information about road traffic accidents, knowledge to each group and to know which group are aware with road traffic rules.

3.3.4 Sampling Procedure

The sampling was done using a combination of probability and non probability methods. The difference between non probability and probability sampling is that, non probability sampling does not involve random selection whiles probability sampling does. Researchers have observed that in applied social research, there may be circumstances where it is not feasible or practical to use probability samples (Flick 1998). (Baker 1999) notes that there are two major goals that sampling can achieve. The first is to establish representatives of what is being studied and conversely to reduce bias, and the second is to be able to make inferences from

findings based on a sample to a larger population from which that sample was drawn. A study based on a sample that does not conform to the above conditions has to use non-probability sampling considering the aim of the study and the respondents to be interviewed.

Sampling of drivers was done using a stratified random method from the sampling frame, based on vehicle day rosters, service route and type of vehicle. Sampling of pedestrians, passengers and motor cycles was conducted using a simple random technique, basically due to absence of sampling frame, whereby the research assistants spotted a respondent at a specified setting every thirty minutes. Each assistant sampled and administered a questionnaire to only 20 respondents within any one category of respondents.

3.4 Data Collection Methods

Data collection is defined as the ongoing systematic collection, analysis, and interpretation of health data necessary for designing, implementing, and evaluating public health prevention programs. WHO, page 5, 2011). The methodology and procedure for data collection employed in the field was based on both qualitative and quantitative methodologies. Questionnaires were provided to the pedestrian, interviews were conducted to the motorcyclists to, observations and review of secondary data were done accordingly.

In the social science literature, the use of both qualitative and quantitative methods in research is commonly referred to as triangulation. Baker (1999) notes that, triangulation enable a researcher to gather evidence from multiple sources to address

the questions at hand from different points of view. One advantage of triangulation is that it can broaden the research and at the same time strengthen the validity of the research.

Baker (1999) notes that, triangulation method is the best method to use when a researcher wants to look at the broad patterns of social life or describe widespread social reactions. Kummar (1996) notes that:

“Both qualitative and quantitative approaches have their strengths and weaknesses, neither one are markedly superior to the other in all types... In many studies you need to combine both qualitative and quantitative approaches”.

The study of factors to road traffic accidents is a complex issue, and this explains the need to involve different aspects, in order to have broader end view on research findings.

3.4.1 Quantitative Methodology

Quantitative methods help to provide comparisons and statistical aggregations of data. Typically quantitative methods are characterized by the use of close ended questions for yes or no answers or set of predefined answers like in the form of Likert scale (example strongly agree or strongly dis-agree) which can be quantified, comparable and measurable to provide numeric results.

During this study, the researcher used a questionnaire as the main tool of data collection. It was administered to the study units through a team of research

assistants who received a full-day preliminary orientation session conducted by the researcher himself on how to carry out the task. The tool consisted of self-reported knowledge and behavior assessment. The questions were framed in a manner as to enable self-administration by respondent, and only when a respondent was not literate enough or for reason of time did the researcher or the assistants administer the questionnaire.

3.4.2 Qualitative Methodology

A qualitative research methodology covers a number of alternative techniques, including interviews, participant observation and focus group discussions. Qualitative methodology helps to understand life experiences and to reflect on the understandings and shared meaning of peoples' everyday social life and realities (Limb, 2001).

In this study qualitative approach has been used to collect the primary source of data through semi-structured interviews with selected drivers and motorists, and key informants among traffic officers, transport officers and pedestrians. The researcher also used his personal observation during the fieldwork to note elements of road user behaviors linked to knowledge/ awareness and application of road traffic and safety rules while using the roads at different points. More specifically, the researcher observed how pedestrians use the road in four different localities (Kwa-Mchaga area, Kigoma Railway Station roundabout, Zulu area at Gungu and Mwanga Sokoni T-section), and different road users respond to the road signs especially the areas where people cross the road frequently.

The researcher himself administered this type of tool. The researcher opted for this type of interview to allow flexibility and give the study some sense of spontaneity that is important for the respondents to produce reliable answers. The interviews have helped to deepen the contents of the questionnaire and captured more views and thought patterns of the respondents.

3.5 Data Types and Sources

This study has used a combination of primary and secondary data for complementarily.

3.5.1 Primary Data

The data collection was based on qualitative techniques, the instruments used, includes, questionnaires, interviews, and direct personal observations, and the focus group discussion.

(a) Questionnaires

Questionnaires were provided to the respondents such as drivers, pedestrian, motorcyclists, pedalists and other official's person like police officer and pupils/student. This was done accordingly, in order to obtain information from all the group that use road.

(b) Interviews

Interviews is to listen to what people say about their lives, listen to them express their views and learn from their view side daily life experiences. The qualitative research attempts to understand the world from the subject point of view. In view of

the above, I needed to hear from other responsible officials their views and opinion about road traffic accidents.

When I was in the field collecting data, I had to introduce myself together with my research assistances explaining who we are and what the purpose of our visit is. In order to receive a warm welcome from the respondents and they should be free to air theirs views and share with us their life experiences. Introducing ourselves helped respondents to be free in giving out their views without being skeptical. The mode of communication was both English and Swahili the choice depended on to what extent a respondent is comfortable with his own language preference between these two languages, so as we can understand each other.

Due to such situation our interview guide was in English and it had to translate to Swahili because most of the drivers, pedestrians, and motorcyclists understood much Swahili and they felt like using it for better understanding. And Swahili is the fist important language for effective communication in Kigoma Municipality. English is the second language for official communication. In collecting data from respondents during conversation we were taking notes. After conversation we made cross checking together with research assistance and whatever they noted down to make sure that details were not omitted.

(c) Focus Group Discussions

A focus Group Discussion is interviews with a small group of people usually six to eight people participants in the interviews for about one to two hours (Patton, 1990). Patton argues that, focus group discussion is the highly efficient qualitative data

collection techniques, which provide some quality controls on data collection. Participants tend to provide checks and balance on each other and it is fairly easy to assess the extent to which there is a relative consistent shared view among the participants.

A group discussion was held at the office of KIVIDEA center in the meeting room of youth development, where by almost eight members were invited from different offices, one member one member from **KVIDEA**, two drivers representative of daldala, one officer from **KIBOA**, one member from **TANROAD** one traffic office and one pedestrian and one executive ward officer from majengo area. The language used were Kiswahili only, where by the officials were happy, openly and willingly to share ideas the meeting took two hours and a half (90 minutes). Also one research assistance included in the meeting.

(d) Observations

More information and awareness about a phenomenon can be obtained through direct personal observation (Burges, (1984) Denzin, (1989) and Patton (1990) note that direct personal observation gives the researcher a valued sources and tools to relate the information obtained from the questionnaires, to crosscheck information gathered through house hold interviews and relevant institutions. It also provides necessary background information on the problem being studied.

Observation was therefore vital qualitative methods used during the data collection period, it involved the process whereby I visited along Lumumba, Kasulu, and Katonga main roads and observed how people make use of the main roads. I did

observe that most cars, motorcycles and bajaj are in hurry, it does not stop at zebra crossing, it overtake each other unnecessarily, road signs of speed limit it is not followed. Pedestrian also tend to cross the road at no zebra crossing even when zebra crossing is available.

3.5.2 Secondary Data

The researcher consulted and used existing data from local and national traffic reports, daily traffic inspection reports and other official traffic files, published and unpublished research reports, and professional publications to compliment, contrast and triangulate the primary data of the study.

3.6 Validity and Reliability

Validity is the extent to which a *concept*, conclusion or measurement is well-founded and corresponds accurately to the real world. The word "valid" is derived from the Latin *validus*, meaning strong. The validity of a measurement tool (for example, a test in education) is considered to be the degree to which the tool measures what it claims to measure. However, in *psychometrics*, validity has a particular application known as *test validity*: The degree to which evidence and theory support the interpretations of test scores. Validity refers to how well a test measures what it is purported to measure (Colin P & Julie Wren, (2005-6) and reliability is the degree to which an assessment tool produces stable and consistent results.

According to Baker, (1999) added that, doing social research is not just a matter of collecting facts based on carefully observation. This type of fact information as an end in itself could be called positivism. According to Bacon (1561- 1626) postulated

that positivism concept that only knowledge is the true knowledge of the world perceived through sense (observable phenomenon).

From the above point of views, this study was exploratory with the aim of assessing awareness of road users and controlling road traffic accidents in Kigoma Ujiji Municipality to all main roads especially tarmac roads that are Lumumba, Katonga, Kasulu Road Via Gungu at Mwandiga Junction. Specifically to assess the awareness of road users such as pedestrian, motorists, and stakeholders in the towns.

The research used both qualitative and quantitative in order to reduce bias that will be caused by chosen one method over the other. In this regards the researcher gathered evidence from multiple to addresses the research questions from different point of view including the interview were done accordingly. More over the fact that the study is not full quantitative and the finding of this research can be or not replicable anywhere even though the method used of data collection can be the same. This is because, the setting of the study and the periods of time in which the study was carried out can and may affect the findings.

3.7 Data Processing, Analysis and Presentation

3.7.1 Data Processing

Before undertaking analysis of collected data, the researcher reviewed the whole data set for errors and omissions, and then classified them according to each data type. Thereafter researcher undertook a thematic coding of the data, reflecting the key issues addressed by the questionnaire and interview questions, which he linked directly to the key variables of the research.

3.7.2 Data Analysis

This process was facilitated by the use of the statistical software, in the recording and analysis of the data. Analysis was done using Univariate, (nonparametric) descriptive statistical procedures, and by applying frequencies distributions, percentages, and measures of central value (mode, mean and median).

3.7.3 Data Presentation

Based on SPSS, different data outputs were created using a combination of tabular and graphical representations in the form of result graphs and charts. These data representations formed the basis of interpretation of the findings of this study and the conclusions and recommendations that followed from it.

3.8 Limitations of the Study

First and foremost, the researcher undertaking this study is a member of the Tanzania Police Force – Traffic Unit. During the study, the researcher was faced with the reluctance of respondents for fear of repression or future trials, especially some of them who had previously been involved in road traffic accidents. The researcher used assistant researchers and KIBOA/KIBOTA leaders, as well as clear assurance that the responses would only serve for study purposes, to convince many fearful drivers to participate. Despite this, the doubts of respondents might have compromised the quality of the responses given. Apart from that, in dealing with this limitation I conducted a meeting with a targeted group official and address the issues of road traffic accidents, mind that in traffic division I am educator, So that I were doing so to overcome the challenges without themselves to know my intention.

On the other hand, the participation of many respondents in answering the questionnaire or the interview was not maximal due to the setting, especially since most respondents were spotted while on the road, in a vibrant and noisy street, amid dense traffic and in the middle of their daily business. Such an environment seemed to reduce the attention of respondents and might have impacted on the quality of their responses as well. Fortunately, the researcher was able to triangulate most survey data with qualitative (interview) responses of respondents.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Background Variables of Respondents

This study has looked at three important demographic variables for respondents, due to their relevance and implications on the implementation of study results. The three variables considered were age, sex and educational level. The rationale for consideration of the above variables is that road use affects people differently according to their age. The researcher also found it opportune to consider how men and women are affected differently; and how they differ in terms of their knowledge, awareness and behavior regarding road use. Educational level is another factor that can affect a person's awareness of and behavior towards road use due to exposure to learning. In looking or observing the situation of road traffic accidents you must consider gender issues, this is because the behaviors of male and female when they were on road, it seems that female obey road signs more than male. That is why probably most people involved in accidents are male. Thus in order to get proper findings gender issues and considerations should be taken on board.

4.2 Demographic Variables of Respondents

4.2.1 Age

The first demographic variable that has been considered in this study was the age of respondents. The findings revealed that the age of all 100 respondents ranged from 6 to 60, and varied according to respondent categories as shown in the summative Table 4.1. Segregated data on age indicate that 8% were aged 6 – 10, 30% aged 11 –

19, 50% aged 20 – 50, and 12% aged 51 – 60. Lower and higher age brackets, namely 6 -10 and 51 – 60 years old, were registered for children and elderly among pedestrians and “daladala” passengers; however, they constituted only 30% of all respondents. Bicycles riders and motor circlers were within the age brackets of 19 - 30, while vehicle drivers were mostly in the age bracket of 30 – 50 years, and these two groups constituted 63% of all respondents. The other 7% was from key informants. This involvement of ages in the study helps to determine which groups are more vulnerable to the road accidents and which groups are more safe or knowledgeable on traffic rules.

4.2.2 Sex

Distribution of respondents based on sex indicates 40% for female respondents against 60% of males. For instance, Komba (2006) found a correlation between age, sex and road traffic accidents in his study in Kibaha district. The most important factor that contributed to having more male respondents than females was that vehicle drivers, bicycle riders and motor cyclers are predominantly men. The researcher tried to compensate for female participation by increasing the number of female respondents among pedestrians and passengers. We can realize that, most injured people in Kigoma municipality involved on road accidents are men rather than female.

4.2.3 Education Level

According to findings from the study, the proportion of the respondents with primary, secondary and tertiary education was as follows: 67% for primary, 25% secondary and 8% tertiary education. The increased number of primary level

respondents can be attributed to the inclusion in the study of children, and drivers who had only primary school education thereafter attended short courses of 6 months or less on driving and were counted as primary school level. I needed to compare the level of education because we have seen that drivers with low level of education several times are involved on road accidents rather than tertiary.

Table 4.1: Summative Table on Demographic Data of Respondents (n=100)

Age	Frequency	Percentage
6 – 10	12	8%
11 – 19	25	30%
20 – 50	45	50%
51 – 60 and above	18	12%
Total Age	100	100%
Sex		
Male	70	60%
Female	30	40%
Total Sex	100	100%
Education		
Primary	50	67%
Secondary	37	25%
Tertiary	13	8%
Total Education	100	100%

Source: Research Data (2013)

4.3 Knowledge of General Traffic Rules

Knowledge of traffic rules is essential for the manifestation of responsible behavior on the road. Knowledge is a human factor. This study has found that the majority of respondents did not know basic traffic rules, which every road users is supposed to know. In fact, while 54 % of drivers in public transport could mention 5 basic traffic

rules on the road, a stunning 80 % of pedestrians, bicycle riders and motor cycles failed to mention beyond 3 rules. The five basic rules considered referred to the following:

- (i) Road side;
- (ii) Traffic signals
- (iii) Road crossing;
- (iv) Priority; and
- (v) Turning.

Table 4.2: Knowledge of General Traffic Rules by Respondents

Variables: <i>ability to recognize/mention appropriate rule</i>	Could not mention 5 rules	%	Could mention 5 rules	%	Total %
Drivers	41	45.6%	49	54.4%	100
Bicycles	4	80%	1	20%	100
Motor cyclers	22	73.3%	8	26.7%	100
Pedestrians and passengers	39	86.7%	6	13.3%	100
Total	106	70.7%	44	29.3%	100

Source: Research Data (2013)

This Table 4.2 shows that there is more knowledge among vehicle drivers than among other road users. Such a gap could be attributed to the fact the drivers have been exposed to some training in order to obtain a driving license for employment prospects. Such a condition may not exist for bicycle riders and motor cycles.

In fact, a key informant observed that, “*we are concerned that many young people rush into the business of being bodaboda riders without prior formal training on*

driving and road traffic rules” (RTO Kigoma, 2013). According to Mwaipopo (2006), responsible behavior is dependent on knowledge and awareness, which determine decision and act.

Knowledge of general traffic rules was higher among people of age bracket between 20 – 50 (79%), and 51 – 60 (68%), and lower among respondents of lower age brackets. Children below 10 were the least knowledgeable, which was indication that they had neither learned the rules in school nor at home. This lack of knowledge extended to ages until 17 – 19 for some, when the probability would be that they were either exposed to some learning through experience or through some informal education means such as the public media.

With regard to gender distribution, research data show that men were more knowledgeable than women, where 30% of men showed that they knew most of the general road traffic rules against 70% women. This difference could be explained by the fact that all drivers who were surveyed were men, while it has already been ascertained that drivers had more knowledge of the traffic rules than all other road users surveyed in this study.

Knowledge of general traffic rules was found not to vary much with the level of education. Among respondents of primary school level knowledge was 67%, while it was 84% for secondary school and 77% for respondents of tertiary level. Graphically the data on knowledge of general traffic rules by age, sex and education can be represented as follows:

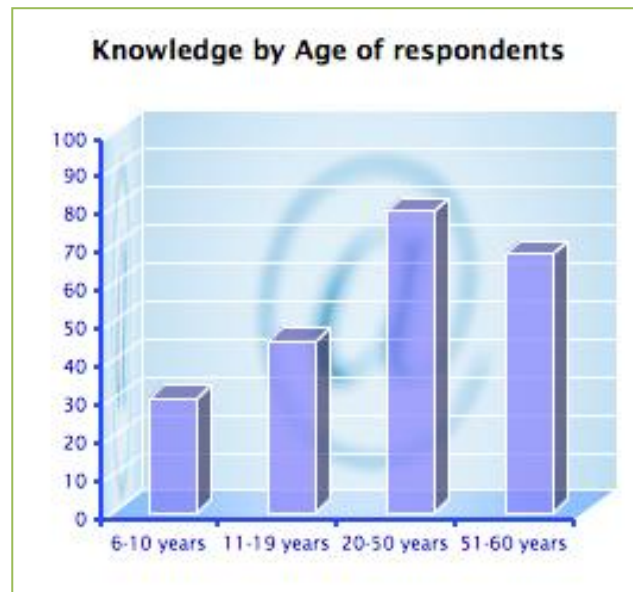


Figure 4.1: Knowledge of General Traffic Rules by Age

Source: Current study

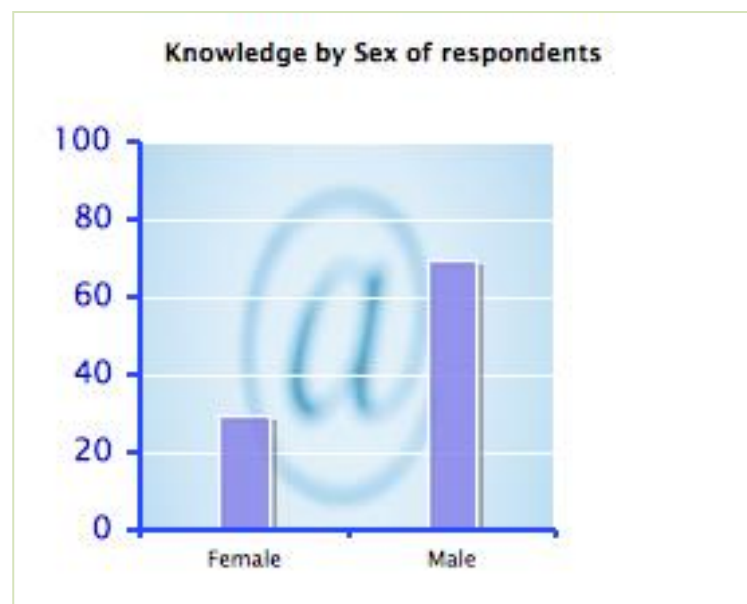


Figure 4.2: Knowledge of General Traffic Rules by Sex

Source: Current study

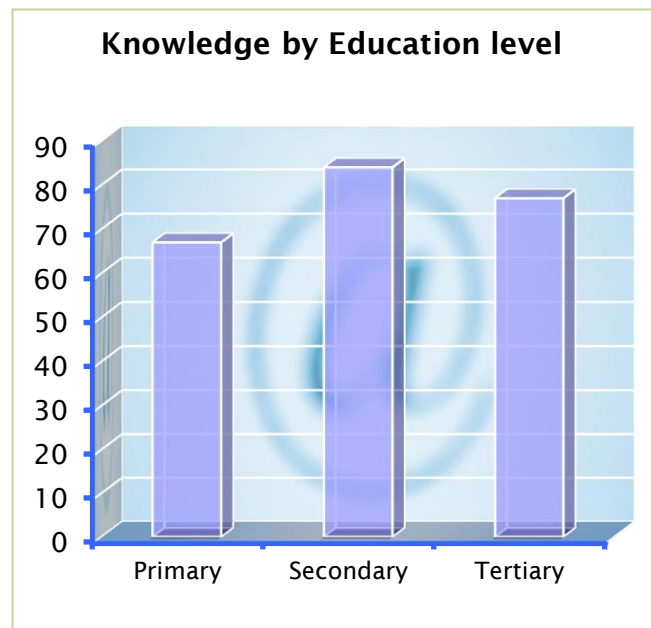


Figure 4.3: Knowledge of General Traffic Rules by Education

Source: Current study

4.4 Knowledge of Rules Specific for Pedestrians

This study revealed that 76% (n=50) of respondents among pedestrians and passengers are not aware of essential road traffic rules that relate to their safety on the road. Beside the general traffic rules, there are specific rules and expectations for pedestrians and passengers of public transport to know while using roads.

This study investigated on the knowledge of pedestrians and passengers about rules and road signs such as recognition of road markings and traffic signals, and understanding road instructions intended to guide pedestrians, consciousness on the road that includes ability to look and the decision taken. Knowledge of traffic rules by pedestrians increased their ability to recognize danger/accident, the measures to avoid it and the ability to act in time. Once again, this agrees with Mwaipopo's (2006) view that responsible behavior is dependent on knowledge and awareness, which determine decision and act.

Table 4.3: Knowledge of Traffic Rules for Pedestrians and Passengers

n= 50	Recognize road markings		Understand traffic signals		Pedestrian sight		Road crossing	
	Yes	No	Yes	No	Yes	No	Yes	No
6 – 10 years	1	3	1	3	2	2	3	1
11 – 19 years	6	9	4	11	11	3	12	3
20 – 50 years	18	7	16	9	21	4	22	3
51 – 60 years	6	0	4	2	6	0	6	0
Total	31	19	25	25	40	10	43	7

Source: Research Data (2013)

The Table 4.3 indicates that, like in the preceding question, respondents' knowledge varied with age. Respondents in the age bracket between 20 – 50 years happened to register more knowledge of rules than other ages on all 4 variables. Knowledge also varies among the dependent variables (recognize road markings, understanding of traffic signals, pedestrian sight and road crossing rules). Overall knowledge remains low for all variables, with some relatively high percentage (35%) registered for knowledge of road crossing rules.

When interviewed with one of the pedestrian a Road Safety Ambassador (RSA) in Kigoma Municipality about the role of pedestrians in road traffic accidents, Mr. Kobe (2014) explained that:

“the problem of most pedestrians is lack of attention while using the road; some walk or cross carelessly on the road, others are as if they are absent minded... perhaps because of personal problems they have at home.”

The same view was supported by a staff of SUMATRA who preferred to remain anonymous that:

“we [government, traffic regulatory bodies] have not put enough efforts in educating people, especially pedestrians on how to use the

roads appropriately. Our education has so far focused more on drivers, but many accidents are caused by drivers trying to avoid careless pedestrians, cyclists and cart pushers.”



Plate 4.1: Children are One of the Most at Risk Groups, but they are the Least Knowledgeable About Traffic

4.5 Knowledge of Rules for Drivers, Bicycle Riders and Motorists

Unlike pedestrians, this group of respondents happened to have better awareness of road traffic rules on driving, but the overall mean remained low as well. Vehicle drivers scored higher with 82% showing good awareness, while bicycle riders scored the lowest with only 52% being knowledgeable. The study measured knowledge of this group of respondents on 4 variables including speeding, overtaking, parking, and priority regulations.

Like for pedestrians, the above table shows that respondents' knowledge varied with age. This time the age brackets changed, with respondents less than 20 years being mostly motorists of “bodabodas”. Respondents in the age bracket between 20 – 40

years were more “youthful” drivers of public transport, while a few drivers were over 50. The older drivers (40 and above) happened to register more knowledge of rules than other ages on all 4 variables.

Table 4.4: Knowledge of Traffic Rules for Drivers, Bicycle Riders and Motorists

n= 95	Speeding rules		Overtaking rules		Parking rules		Priority rules	
	Know	Don't know	Know	Don't know	Know	Don't know	Know	Don't know
Under 20 years	4	18	8	14	15	7	9	13
20 – 40 years	7	5	8	4	10	2	9	3
41 – 50 years	14	4	16	2	13	5	12	6
Above 50 years	7	0	7	0	6	1	5	2
Total	32	27	39	20	44	15	35	24

Source: Research Data (2013)

Here again, the level of knowledge of respondents varied on the dependent variables. Overall knowledge remained medium (45% - 60%) for all variables, with some relatively high percentage (88%) registered for knowledge of speeding rules. The good proportion of knowledge observed on this question can be attributed to the big number of vehicle drivers, most of whom had undergone some formal training on driving and regular traffic checks while on the road.

4.6 Application of General Road Safety Options

The application and respect of essential road safety rules can help to reduce road traffic accidents and related casualties (fatalities and injuries). A study by Komba (2006) in Kibaha District, in Tanzania, found that passengers and pedestrians are always at highest risk of being injured or killed on the road. The toll of road accidents can be reduced to a great extent if awareness of safety measures while on the road is increased among all road users.

This study has investigated the knowledge of road safety options among respondents, focusing on the following measures: use of seat belt, use of helmet, mobile phones and drinking/alcohol use while driving. The field data show while 74% of respondents said they were aware of the measures/rules, only 31% acknowledged adhering to these safety procedures. Further analysis of the data indicates that 83% of all respondents said they only use or apply these measures between 25 - 50% of the times they use the road, which corresponds to “rarely” and “sometimes” in the Likert Scale.

Table 4.5: Application of Road Safety Measures by Road users While on the Road

N= 140	Use seatbelt		Use helmet		Use mobile phone		Drink & drive	
	Yes	No	Yes	No	Yes	No	Yes	No
Drivers	9	51	N/A	N/A	49	11	34	26
Motorists /cyclists	N/A	N/A	30	0	27	3	19	11
Passengers	0	5	4	1	5	0	N/A	N/A
Pedestrians	N/A	N/A	N/A	N/A	37	3	N/A	N/A
Total	9	56	34	1	118	17	53	37

Source: Research Data (2013)

Research worldwide shows that the use of helmet can reduce the risk of fatal injuries for motorists by 85% (Thomson et al, 1989). The same view was shared by Rivara who also reported the effectiveness of the helmets in pedal cyclists and motor cyclists (Rivara 1985). The effectiveness of helmet use is dependent up on the speed of the motorcyclist. It is more protective at low speed and less effective at higher speeds.

On the other hand, safety belt use by front seat occupants has been found to reduce motor vehicle related injuries (MMWR, 1992; Leon, 1996). In England it was observed that compulsory seat belt wearing was beneficial (Broughton, 1991). Seat belts for older, children and adults prevent approximately 50% to 60% of all fatalities resulting from motor traffic accidents (Rivara, 1985).

During a televised educational program, Palfreman (2013) gave the following observations:

“Wearing a seatbelt reduces the risk of a fatality among front seat passengers by 40-50% and of rear seat passengers by between 25–75% and Wearing a motorcycle helmet correctly can reduce the risk of death by almost 40% and the risk of severe injury by over 70%.”

Kikoye (2013) shared this view when he observed that wearing a seatbelt reduces the risk of a fatality among front seat passengers by 40-50% and of rear seat passengers by between 25–75% and wearing a motorcycle helmet correctly can reduce the risk of death by almost 40% and the risk of severe injury by over 70%. As for pedestrians, the researcher observed the application of measures related to road crossing and careful behavior on the road.

For instance, the research data show that 73% of pedestrians said they use their mobile phones on the road, including reading and sending text messages, as well as chatting on Facebook while walking on the road. Though all interviewed pedestrians recognized that such behaviors increase the risk of being knocked by a vehicle or other road users, only 20% of them said that they cared about it. During the research

period, a vehicle knocked a teenager at Gunguarea as the youth who was playing football on the road tried to run after the ball as it crossed to the other side of the road.

4.7 Respect for Road Signs

Road signs comprise traffic safety signs and traffic control signs. These signs are essential to ensure the safe operation of motor traffic and to guide other road users. Pedestrian Signs are one of the most important traffic signs on the road today. Unfortunately, despite the growing road traffic density in the area, most new roads in Kigoma are simple, single lane and not endowed with enough traffic signs, much less with pedestrian traffic signs. For instance, there are no traffic lights available throughout Kigoma town; therefore the researcher did not investigate traffic signs. In this way, the roads in Kigoma still have the same characteristics of rural roads. Road signs serve three major purposes, namely:

- (i) Giving orders or instructions,
- (ii) Warning, and
- (iii) Informing

During this study, the researcher investigated whether road users recognize and respect some essential road signs while using the road. The variables considered here were: recognition of signs related to on-street parking, slow down, speed limit and lane markings for drivers and motorists; and recognition of sign related to walkways and crossing for pedestrians. The results were that 72% (N=43) of drivers said that that traffic control signs on the road were generally lacking, while 19% (N=11) said they did not find it important to have the signs. According to these respondents,

having the signs would not help much because of the quality of the roads (too narrow). Table 4.6 shows results per group respondents.

Table 4.6: Recognition of Road Signs by Drivers and Motorists

<i>What is your opinion on the following availability of the following road sign or traffic instruction? (N=90)</i>	Not needed	Non-existent	Very few	Enough	Total
On-street parking signs	0	32	46	12	90
Slow down signs	5	44	14	27	90
Speed limit signs at critical areas	2	51	10	27	90
Lane markings	0	4	38	48	90

Source: Research Data (2013)

The Table 4.6 speaks volume to explain the reason why the number of road traffic accidents is found to be high in areas with high pedestrian traffic in Kigoma. Poor parking on the verge of a narrow road with high traffic is very dangerous as it can obstruct pedestrians, cyclists and other road users; thus increase the risk of collision. Respondents in this study recognized that there are parking signs for public transport vehicles or “daladala”, but there are no signs for private vehicles. According to Mussa, a daladala driver:

“Private drivers park carelessly on both sides of the road even at high traffic areas, and this is a major problem, especially as the road is very narrow.”

A pedestrian who identified himself as Kajo complained saying:

“Drivers park their cars everywhere, without being concerned about other road users. They force us to walk in the middle of the road, exposing us to risk of accident!”

On the other hand, driver respondents observed that the road in Kigoma passes in residential zones with intensive economic activities, such as Kigoma Mjini, Mwanga, Gungu and Bakwata areas. Due to this situation, it is important to have road instructions related to speed limits, and road warnings for slowing down, crossing zones and parking. Unfortunately, apart from drawings of Zebra signs on the road, there are no other signs and warnings to guide drivers. Still, Bula, another interviewed driver objected saying, *“Those Zebra markings on the road quickly wear out due to poor quality of the materials; only after a few weeks you can hardly read them today.”*



Plate 4.2: Non-Respect for Sight and Failure to Read Communication from other Drivers Lead to Accidents Like this

It goes the same for lane markings. These are supposed to help set the boundaries of the road, to indicate the carriageway from the walkways. Even though there are lane lines on Lumumba road and Kasulu road, most drivers recognized that, *“you cannot always guarantee to drive within the lane”*. 61% of drivers said they drive outside

the lanes, either across the two lanes or over the walkways. Again, drivers mentioned the reasons for not respecting lane boundaries being bad parking and narrow roads. As for pedestrians, the Table 4.7 shows that 38% only of pedestrians understand the meaning of lane markings, walkways and zebra markings; while about 43% said they don't usually realize there is a Zebra crossing and so do not use it.

Table 4.7: Recognition of Zebra Markings and Walkways for Pedestrians

<i>What is your opinion on the availability of the following road sign or traffic instruction?</i>	I understand the use	%	I don't understand the use	%
Walkways (pavement)	12	38%	28	62%
Zebra crossing	23	57.5%	17	42.5%

Source: Research Data (2013)

At Mwanga-Kwa Mchaga, one of the high pedestrian traffic areas in Kigoma town, pedestrians complained that petty traders occupy walkways, and that the zebra markings are not visible enough on the road. Though there are zebra markings in many places, there are not other signs to indicate the presence of the markings, and so they often go unnoticed by both pedestrians and drivers. At nighttime, these zebra markings are not reflective, so they are totally unseen.

Besides, 5 out of 7 interviewed pedestrians said they had not seen the parking sign for “daladala” before. Pedestrians lamented the behavior of drivers not respecting walkways for non-motorized users. Pili, a youth respondent said, “*Drivers behave as if they are the only ones entitled for road use.*” Kobelo (2013) supports this accusation of pedestrians when he says, “*In urban areas, pedestrians are forced to*

walk on the carriageway since some vehicles usually park on the sidewalks and sometimes the sidewalks are used by petty traders.”



Plate 4.3: Narrow Walkway Pavement Like Seen in this Photo of Lumumba Street are not Appropriate for use Pedestrians

A Traffic Inspector acknowledged the challenge of narrowness of the road and admitted that, *“There are more and more vehicles, motorcycles and other users on the road every day, so this is a challenge for everybody to understand that everyone has a right to be on the road and respect that.”* According to Chiduo (2001), the growing number of pedestrians and in some cases also the bicycles that use the same carriageway as motorized traffic causes problems in many urban areas. He notes, *“Even where there is sufficient space, physical segregation between the various road users is not commonly used”*.

It has been ascertained that the presence of direction signs for cyclists and pedestrians, as well as the availability and respect for pedestrian crosswalks can help to reduce road traffic accidents. The results from this research indicate that such important signs and instructions are non-existent on Kigoma roads, and thus constituting an important factor related to the rising toll of road traffic accidents.

4.8 Respect for other Road Instructions

A good and safe road takes considerations for the needs of the different road users.

Chiduo, (2001) observes that:

“In ... areas where walking is a major mode of transport, pedestrians are placed at considerable risk due to the higher speeds of traffic and lack of pedestrian facilities.”

Apart from road signs that aim at controlling speed, there are also measures such as road bumps, parking areas, loading and offloading areas, speed limits. These measures have to do with drivers rather than pedestrians. While there are no road bumps anywhere on the road in Kigoma town, research data indicate that there are enough parking bays for public transport or “daladala” on Lumumba road and Mwandiga road, but no parking directives for private vehicles on both roads, and no road signs giving speed direction/instructions at key areas.



Plate 4.4: This Parking Bay at GTZ on Lumumba Road does not have a Parking Signpost

Observation of traffic routines at parking places spotted passengers rushing to board or disembark from a bus while it is in motion, especially during the rush hours when there are more passengers than the number of buses. The research further observed the crowding of parking bays, as large trucks and private vehicles also shared the same parking facilities. When interviewed, 77% of drivers said they knew it was not appropriate but they had no options; while 46% said very often they are obliged to park outside the parking bay because the place is not enough or there are private vehicles parked there.

In general, 54% of drivers said they park outside parking areas for loading or offloading passengers. When interviewed about the reasons for doing so, these drivers attributed the fault to poor road structure. With regard to speed limiting, the researcher asked to know whether the drivers would prefer having the speed limit signs in place and if so, whether they would be willing to follow them. The results were as in the Table 4.8.

Table 4.8: Driver's View on the Application of Speed Limits

<i>Driver's willingness to driver at this speed(N=60)</i>	Never	Sometimes	Often	Usually	Always
Between 20 - 40km/h	1	19	24	15	2
Between 40-50km/h	0	4	20	30	6
Between 50 - 70km/h	0	15	29	14	2
Over 70km/h	2	41	10	7	0

Source: Research Data (2013)

This Table 4.8 gives us a clear cue on how speeding is an issue in relation to control of traffic accidents. While most traffic rules indicate that the ideal driving speed in a

town like Kigoma is 50km/h, research data show that most drivers have used higher speeds than the ideal limit. Interview data give a more complete picture of the issue as most of the respondents (75%) reported that they know/understand the speed limit, but it is difficult to always follow it. Among the reasons given are:

- (i) Competition from other transporters (daladala);
- (ii) The need to have more trips and thus more income; and
- (iii) Passengers complaining.

For few respondents (12%), lack of speed control was also an issue; especially, they mentioned that *“if there were no enforcement measures, nobody would be following laws and rules”* just because they are there!

Speeding was a general and major issue for motorists. While 80% of motorists did not know the speed requirements/regulations, most of them acknowledged that over speeding is risky and the cause of most motor accidents. For 40% of motorists, speeding was associated with overtaking, drinking or drug use, and what they called “learner syndrome”, referring to the excitement of youngsters just experiencing driving.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In concluding the findings of this study, it is important to fall back on the objectives that the research set forth at the beginning. In this way, it is easier to see what findings the study has yielded from the field, and how those findings help to answer the initial questions that justified the investigation. In the following paragraphs, the researcher outlines the key ideas that stand out of the data analyses and discussions presented in the previous chapter.

5.1.1 With Regards to the Knowledge of Road users on Essential Road Traffic Rules and end-user Options

The study has found that knowledge of traffic rules varied greatly among respondents by type of road user. There was overall more knowledge among vehicle drivers than among other road users. Motorists and cyclists happened to have better awareness of road traffic rules on driving than pedestrians, though the overall mean remained low as well. Pedestrians were found to be the least knowledgeable of all categories of respondents.

Furthermore, knowledge of general traffic rules increased with age, as respondents above 50 years showed more awareness of rules than those of lower ages. Children below 10 were the least knowledgeable all. The study also found that men were more knowledgeable than women, but there was no evidence that awareness of traffic rules varied much with the level of education. All in all, knowledge of traffic rules by

pedestrians increased their ability to recognize danger/accident, the measures to avoid it and the ability to act in time.

5.1.2 With Regard to the Ability of Different Road users to Observe Safety

Rules While on the Road

The field data further indicated that despite the level of awareness of traffic rules, only 31% showed dispositions for using safety measures while on the road. More specifically, when inquired about the use of seat belt, helmet, mobile phones and alcohol while driving, about 80% reported breaking or caring less about these rules. Though all interviewed pedestrians recognized that such behaviors increase the risk of being knocked by a vehicle or other road users, only 20% of them said that they cared about it.

The results were that 72% of drivers said that traffic control signs on the road were generally lacking, while 19% said they did not find it important to have the signs. The study observed poor presence and respect for road instructions related to speed limits, and road warnings for slowing down, zebra crossing, lane markings and on street parking.

As for pedestrians, 38% only understood the meaning of lane markings, walkways and zebra markings; while about 43% said they don't usually realize there is a Zebra crossing and so do not use it. Overall, the data indicate that there is poor observance of traffic instruction and safety regulations among the various road users in Kigoma-Ujiji municipality. Several reasons have been given to account for this situation, including the following:

- (i) Poor road structures;
- (ii) Not enough safety signs;
- (iii) Not enough control signs;
- (iv) Ineffective driver and motorist education; and
- (v) Low education of pedestrians, cyclists;

5.1.3 To Find out Key Gaps in Public Awareness of Traffic Rules and Regulations

It has transpired from this study that there has not been enough effort to increase the awareness of the road users on life saving road traffic rules and safety measures. The following gaps in terms of public education on traffic rules and regulations:

- (i) First, pedestrians and cyclists have not been educated on road signs, road instructions and safety measures to use while on the road;
- (ii) Second, most drivers have inadequate training, or no formal training at all; which makes them unfit to operate vehicles on high traffic roads and in the complexity of a modern urban environment;
- (iii) Third, motorists are increasingly important stakeholders in the road use, but they are equally or even more affected by lack of road use knowledge. This is shown by their consistent display of carelessness while using the road.

5.2 Recommendations

Basing upon the results of this study and the conclusions drawn from them, the following recommendations are essential to help fill the gaps and shortcomings:

5.2.1 With Regard to Education and Training

- (i) Improve the knowledge of road traffic rules and instruction for all road users through public education activities. Awareness campaigns and education should be tailored to the specific contexts and needs of different road users such as children, adults, disabled persons and the illiterate;
- (ii) Education needs to be comprehensive, in that it should address/cover essential traffic information, instruction and rules, and safety measures to be followed by each category of road users;
- (iii) Education should also employ a diversity of methods and means to reach to most at risk, yet underserved groups of road users. Specific education campaigns in the form of school curricula, visual/audio and print media, as well as other types of public information means should be used;
- (iv) Driver training and in-service education should be stressed; motorists and cyclists also need to have basic training and education on road traffic rules and safety.

5.2.2 With Regard to General Traffic Policy Enforcement

- (i) Efforts need to be done to increase enforcement of traffic laws, rules and regulations; the Traffic officers are responsible to ensure that safety measures are not sabotaged by all road users, and therefore they must work responsibly to ensure effective and responsible behavior on the road is applied by all;
- (ii) Traffic officers should also monitor more effectively driver training and licensing, and this should include motorists as well;

- (iii) And at the same time Traffic Officers should apply effective corrective measures against drivers, motorists, cyclists and pedestrians who display careless/reckless behavior on the road.

5.2.3 With Regard to Road Environmental

- (i) Road design and maintenance should also be improved to ensure essential facilities are available and functional all the time to serve the specific needs of all road users.
- (ii) This includes for instance, the construction and maintenance of pedestrian walkway pavements, availing of parking spaces for both private and public vehicles, increase of sign posts that give essential traffic instructions and information to various road users, etc.

5.2.4 Intervention

Although the government has put in place the construction of road in Kigoma until the main road and small roads in the streets there are need to make sure that all roads has walking way that is pavement in order to help innocent people like pedestrian to pass through without any problems. We have seen that the group of people those has no education or awareness are pedestrian because every day there are group of people from villages. The pedestrian who live in town are aware of road safety regulation but not who live in the villages.

As a social worker, in order to reduces the number of fatalities in Kigoma municipality education in all parts of the Regional should be emphasized rather than now days education is provided in the schools of towns and not in the villages.

Remembers that people are always moving from one places to another. It is better to organize meeting in the villages and talk with the natives the burden and lose of road traffic accidents.

Motor cycles anywhere are always in hurry, they don't know how to drive in a reasonable speed, they do not stop in a zebra crossing, they overtake randomly without to obey the law. All this is done due to moderate punishment they receive from law enforces like traffic Police, they punish to pay Tshs. 30,000/- only. I suggest that for those who done mistake like driving in a speed beyond limit should be send before the court to answer his charge.

TANROAD in Kigoma should ensure that any road constructor should build walking way for pedestrian and also law enforces should displine those drivers who pass in the pavement. As a social worker, I think if this be emphasized and every law enforces take his or her responsibility road traffic accidents can be avoidable and diminishing if not to reduce.

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APPENDICES

Appendix 1: Questionnaire For Pedestrians

Dear Sir/Madam,

First of all I would like to introduce myself briefly. My name is Shaban Haruna; I work with the Ministry of Home Affairs – Traffic Police Department in Kigoma. But currently I am also a student of the Open University of Tanzania pursuing Master of Social Work. It is a requirement of the University for all students of Masters level to undertake research in an area of their interest in order to graduate.

This is the reason why I am asking you to answer the following questions brought to you by my research assistant who is giving this form to you. I guarantee that the information collected will be used for improve the project not otherwise and kept strictly confidential. Therefore, I ask you to answer the questions freely and without any pressure.

A few questions about you:

Location/Place of interview: _____ Time: _____

Your Sex (*Tick*): (i) M (ii) F Your Age: _____

Education (*Please tick one*):

(i) Primary

(ii) Secondary (0'Level)

- (iii) Advance (A'Level)
- (iv) College (Technical)
- (v) University

Please, answer all questions:

1. Please, mention any 5 traffic rules you know that should be followed while one is walking on the road (*write in the spaces provided*):

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____
- (v) _____

2. What is the meaning of this traffic sign according to your understanding:
(*Show sign cards and ask respondent to tell the meaning*)

3. What is the correct side to walk on the road for a pedestrian:

- (i) The left side of the road
- (ii) The right side of the road
- (iii) Opposite the traffic
- (iv) In the same direction of the traffic
- (v) I don't know.

4. What are the correct rules for crossing the road among the following (*tick all correct options*):

- (i) Cross in front of a parked vehicle

- (ii) Cross from behind a parked vehicle
- (iii) Cross at a bump
- (iv) Cross at a zebra sign
- (v) Cross when there is no traffic

5. What is your opinion on the following behaviours: It is ok to/I do the following

- (i) Talk on mobile phone while walking on the road: Yes () No ()
- (ii) Read & write a text (sms) while walking on the road: Yes() No ()
- (iii) Read a newspaper while walking on the road: Yes() No ()
- (iv) Walk on the road while drunk: Yes() No ()

6. What is your opinion on the availability of the following road sign or traffic instruction? (*Tick what applies*) *I understand that ...*

- (i) Walkways rules: Yes() No ()
- (ii) Zebra crossing rules: Yes() No ()

Thank you very much for your cooperation when answering to the questions.

Appendix 2: Interview Guide for Pedestrians

1. What are according to you the causes of road accidents in Kigoma-Ujiji municipality?
2. Who according to you is to blame the most for causing road traffic accidents in Kigoma-Ujiji municipality? Motivate your answer
3. What efforts do you think have been/are being taken by the responsible authorities or bodies to educate road users in Kigoma-Ujiji municipality?
4. Are these efforts according to you enough? Motivate your answer
5. What would you reproach to other pedestrians/passengers in relation to accidents?
6. What advice would give to help control road accidents in Kigoma-Ujiji municipality?

Appendix 3: Questionnaire for Drivers & Motorists

Dear Sir/Madam,

First of all I would like to introduce myself briefly. My name is Shaban Haruna; I work with the Ministry of Home Affairs – Traffic Police Department in Kigoma. But currently I am also a student of the Open University of Tanzania offering Master of Social Work. It is a requirement of the University for all students of Masters level to undertake research in an area of their interest in order to graduate.

This is the reason why I am asking you to answer the following questions brought to you by my research assistant who is giving this form to you. I guarantee that the information collected will be used for improve the project not otherwise and kept strictly confidential. Therefore, I ask you to answer the questions freely and without any pressure.

A few questions about you:

Location/Place of interview: _____ Time: _____

Your Sex (*Tick*): M(☐) F (☐) Your Age: _____

Education (*Please tick one*):

- (i) Primary (☐)
- (ii) Secondary (O'Level) (☐)
- (iii) Advance (A'Level) (☐)
- (iv) College (Technical/vocational/Driving school)(☐)
- (v) University

Have attended a formal driving school? Yes() No ()

Thank you, now please answer the following questions:

7. Please, mention any 5 traffic rules you know that should be followed while one is driving (*write in the spaces provided*):

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____
- (v) _____

8. What is the meaning of this traffic sign according to your understanding:

(*Show sign card 02 and ask respondent to tell the meaning, then ask the respondent to indicate his/her answer in the spaces below*)

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____
- (v) _____

9. Briefly answer the following questions according to your understanding:

- (vi) What is the most appropriate speed to drive in town?
- (vii) Mention 1 condition in which it is appropriate to overtake

- (viii) Mention a general rule for priority at a T- Junction (section).
- (ix) How do you know a place other than a parking bay is appropriate for parking or not?

10. How often do you use these safety measures while driving (*choose the most applicable option*):

(vi) Use seatbelt:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐
Always

(vii) Use helmet:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐
Always

(viii) Use a mobile phone:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐
Always

(ix) Drink and drive:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐
Always

11. What is your opinion on the availability of the following road signs? (*choose the most applicable option*):

(v) On-street parking signs:

☐ Not needed ☐ Non-existent ☐ Very few ☐ Enough

(vi) Slow down signs:

☐ Not needed ☐ Non-existent ☐ Very few ☐ Enough

(vii) Speed limits at critical areas:

☐ Not needed ☐ Non-existent ☐ Very few ☐ Enough

(viii) Lane marking:

☐ Not needed ☐ Non-existent ☐ Very few ☐ Enough

12. How often do you drive at the following speeds in town?(*choose the most applicable option*):

(iii) Between 20 - 40km/h:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐

Always

(iv) Between 40-50km/h:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐

Always

(v) Between 50 - 70km/h:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐

Always

(vi) Over 70km/h:

☐ Never ☐ Rarely ☐ Sometimes ☐ Usually ☐

Always

Thank you very much for your cooperation when answering to the questions.

Appendix 4: Interview Guide for Key Drivers and Motorists

1. What are according to you the causes of road accidents in Kigoma-Ujiji municipality?
2. Who according to you is to blame the most for causing road traffic accidents in Kigoma-Ujiji municipality? Motivate your answer
3. What would you reproach to other drivers in relation to accidents?
4. What is your assessment of the road infrastructure as a factor for road traffic accidents in Kigoma-Ujiji municipality?
5. What efforts do you think have been/are being taken by the responsible authorities or bodies to educate road users in Kigoma-Ujiji municipality?
6. Are these efforts according to you enough? Motivate your answer
7. What advice would give to help control road accidents in Kigoma-Ujiji municipality?

Appendix 5: Interview Guide for Key Informants

1. What are according to you the causes of road accidents in Kigoma-Ujiji municipality?
2. Which group of road users would be blamed the most for causing road traffic accidents in Kigoma-Ujiji municipality? Motivate your answer
3. What is your opinion on the road infrastructure as a factor for road traffic accidents in Kigoma-Ujiji municipality?
4. What efforts do you think have been/are being taken by the responsible authorities or bodies to educate road users in Kigoma-Ujiji municipality?
5. Are these efforts according to you enough? Motivate your answer
6. What advice would give to help control road accidents in Kigoma-Ujiji municipality

Appendix 6: Direct Person Observation Checklists

Crossing the road

- (i) Look for a safe place to cross.
- (ii) Stop and wait near the edge of the road.
- (iii) Look right and left and listen for traffic.
- (iv) Let any traffic travelling in each direction pass and then look right and left again.
- (v) Quickly walk across the road when it is clear.
- (vi) While crossing continue to watch and listen for traffic coming.
- (vii) Don't cross at a corner or bend in the road.
- (viii) Don't cross near or at parked vehicles.
- (ix) Don't run across the road.

Zebra Crossing.

- (i) How pedestrian use to cross zebra.
- (ii) If they place one foot on the crossing to indicate that one wishes to cross.
- (iii) If the drivers let the pedestrian cross the road at zebra according to the rules.
- (iv) Pedestrian watch carefully when approaching traffic.
- (v) How motorist obey Zebra crossing by stopping and allow pedestrian to cross Zebra crossing.
- (vi) Drivers of vehicles as they approach zebra crossing if they slow down and be prepare to stop.

Walking beside or along a road

- (i) I wanted to observe if the pedestrian walking beside or along the road.
- (ii) If they walk to the right hand side of the road facing the oncoming traffic.

Bad driving behaviours

- (i) Poor lane discipline
 - If they drive in between those white dashed.
- (ii) Indicators.
 - Cutting corners abruptly, particularly at junctions;
 - No headlights in conditions that require them;
 - Leaving main beam on, or dipping only at the last minute;
 - Inappropriate use of the horn;
 - Impatient people pushing in ahead of a queue of traffic

(iii) Speed

- Expect to encounter different road users
- To be patient
- To give others time and room
- To be ready for others to make mistakes
- To concentrate on your driving
- Never drive and use a mobile phone
- Never drive while drunk