

**THE EFFECT OF ROAD SAFETY MEASURES IN REDUCING ROAD
TRAFFIC ACCIDENTS IN DAR ES SALAAM: THE CASE STUDY OF
KINONDONI DISTRICT**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS
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CERTIFICATION

This is to certify that I have ready and hereby recommend for the acceptance by the Open University of Tanzania (OUT) a dissertation entitled “The Effect of Road Safety Measures in Reducing Road Traffic Accidents in Dar Es Salaam: The Case of Kinondoni District” in partial fulfilment of the requirements for the Master Degree at the Open University of Tanzania.

Dr. Raphael Gwahula
(Supervisor)

Date

DECLARATION

I, Ajuae Heri Msese, do declare that this dissertation is my own work and that; it has not been presented to any other University for a similar or any other degree award.

.....

Signature

.....

Date

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DEDICATION

This dissertation is dedicated to my family. I say thank for their support, tolerance during the whole period of my study

ABSTRACT

The general purpose of this study was to examine the effects of road safety measure in reducing road traffic accidents in Dar es Salaam city. The study wanted to fill the gap that why despite of all efforts made by the government in establishing and implementing road safety measure, still the problem of road traffic accidents is increasing? The study applied exploratory research design which has helped in understanding the nature of problem. In particular, qualitative and quantitative research methodologies and methods were also employed by the study, in gathering and analysing required information's related to the topic under study. The findings of the study found that road safety measure have little contributions in reducing the problem of road traffic accidents. It was noted that the causes of road accidents are many and varied such as human factor, infrastructural, environmental, situational and mechanical factors. Therefore, the occurrence of road traffic accidents could not be explained by the violation of road safety measures alone. Moreover, the study also noted that road safety measures are many and they are known by various road users, but they are not followed. The reason behind was that road traffic accidents is strongly linked to available recourses and capacity of the national and local authorities to put road safety strategies in place. The assumption was shortage of resources and power to follow up on control and enforcement can result in lower motivation of police force. Finally, the study recommends that implementing road safety measure should go together with the efforts in reducing poverty. Furthermore, enforcement and education are the most common and results indicate that enforcement efforts should be accompanied by public information campaigns.

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ABBREVIATIONS AND ACRONYMS

BICO	Burea for Industrial Cooperation
GDP	Gross Domestic Product
GNP	Gross National Product
LIC	Low Income Country
MBA	Masters Of Business Administrations
NRSC	National Road Safety Council
OUT	Open University of Tanzania
RTA	Road Traffic Accident
SUMATRA	Surface and Marine Transport Regulatory Authority
TNRSP	Tamil Nadu Road Sector Project
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

It is common knowledge that road transport is very crucial for the movement of goods and people which marks the backbone of the economy and sustainable development. However as important as it is the system has always been accompanied by a good deal of catastrophe emanating from tragic road accidents, which have been increasing year after another. Millions of people are reported death and other millions injuries because of road traffic accidents. Its associated consequences are ranging from social and economic; it affects individual, families and the country. In so doing, the study was interested to examine the effects of road safety measures in reducing road traffic accidents.

1.1 Background to the Study

It was evident that road safety is a very old problem in the world (Rassool, 2007). Evidence from literature by Jacobs (2000) noted that, In Great Britain, for example, there were over 1,000 deaths a year even before the advent of the motor car. By 1970 this figure had reached 7,500, with over a third of a million people being injured. In 1974, in those countries of Europe making returns of road accidents to the United Nations, 90,000-persons were killed and 1,800,000 injured by motor vehicles.

In the same year in the United States over 55,000 were killed (Jacobs, 2000). It is acknowledge that, despite the enormity of these figures, road deaths and injuries seem to have very little impact on the general public. For some time comfort was taken, in most European countries, in the fact that the accident rate per vehicle-kilometer travelled had been decreasing and it was conveniently forgotten that the

absolute numbers of accidents and the economic cost to the community were rising steadily.

The facts presented above are similar to what is happening in developing countries. It is noted that there is an increase in road traffic accidents which associated to death and injuries. As reported by Transportation Research Board (2006), this increase in road traffic accident is associated with the rapid expansion of motor vehicle use in developing nations, road traffic-related deaths and injuries are rising sharply. It is reported that at least more than 1 million people died from road traffic crashes in low- and middle-income nations in 2000; according to the World Health Organization (WHO) that number could nearly double by 2020. Noticeable, Children are particularly vulnerable; WHO calculates that in 2002, road traffic injuries were the second-leading cause of death globally among those aged 5 to 29, and 96 percent of those killed lived in low- and middle-income countries. Nonetheless, it is suggested that on the order of 20 serious injuries are estimated to occur for every road death. Beyond the human toll, road traffic injuries impair the growth and development of low- and middle-income countries by draining at least 1 percent of their gross domestic product, or \$65 billion annually (World Health Organization, 2013).

Basing on the report from International Transport Forum, (2013) road safety performance depend somewhat on what indicator is used as a measure of exposure to risk; population, number of registered vehicles or distance travelled by motorized vehicles. However, there has been considerable debate over which indicator is most appropriate to measure exposure to risk. Those in the health sector prefer the use of

population as the denominator, since it permits comparisons with other causes of injury and death, including infectious diseases. As the health and transport sectors increase their level of co-operation, fatalities per 100 000 populations is becoming more widely used as the standard indicator. In the transport sector it has been common, where data are available, to use fatalities per distance travelled (e.g. fatalities per million vehicle-kilometers) as a principal indicator, or fatalities per 10 000 vehicles.

All the same, this shows that Road Safety is a serious problem all over the world; its severity is more pronounced in the developing countries, especially in Africa. Tanzania being one of the African countries is no exception in this regard. The Tanzania Road Safety Policy, (2009) report that road accidents are on the increase; at the same time vehicle registration is also increases. As noted by Chiduo et al (2001) the government of Tanzania has made a commitment to tackle the road safety problem by developing and implementing a comprehensive road safety program. However despite this commitment by the government, the frequency of accidents over the past ten years has increased. The cost of road accidents in Tanzania has recently been estimated at TShs. 20 billion annually. Overloading on the major highways is estimated at 20-25% hence being one of the causes of undue damage to the road pavement. This study therefore is interested to examine the effects of road safety measures in reducing road traffic accidents in Tanzania.

1.2 Statement of the Research Problem

Although road transport system is the most important mode of transport in developing countries and Tanzania in particular, the government and the public are

concerned about the safety of the system. It is evident that at least 1.3 million people die and more than 50 million are injured each year worldwide as a result of road crashes TNRSP, (2009). Nonetheless, the number of road traffic accidents is increasing while more effort and intervention of reducing the problem have put in place. In the same manner SUMATRA, (2007) noted that Road Traffic Accidents contribute to economic decline with an estimation of 2% of the GDP in 2002. The problem is compounded by the fact that the total population of vehicles in the country has been growing year after year.

The report by Tanzania Road Safety Policy (2009) shows that the average growth in the years 1998 – 2007 was 10%, registered vehicles as of December, 2005 were 231,197 nation-wide, while in December, 2006 and December, 2007 registered vehicles stood at 311,712 and 382,152 respectively. Out of the vehicles registered as of December, 2007, commercial vehicles, which include both passenger and freight vehicles, were estimated at 295,558 (passenger vehicles numbered 199,021 and freight vehicles numbered 96,537).

It was anticipated that the initiated road safety measure and other effort would have reduced the increases of road traffic accidents in the country. However, this is not the case because the problem of road traffic accident is still increasing. As noted in Police records until 2008 alone, a total of 379,699 road crashes occurred in the country. In these crashes at least 48,754 people died and 347,657 persons were injured and a substantial amount of property damages. Noticeable, majority of these accident victims are pedestrian and bus passengers. On the other hand, the study by BICO, (2007) estimated that, the annual loss due to road accident in Tanzania

amounts 3.4% GDP whilst the WHO has estimated that the total crash cost in low income countries (LIC) is are equivalent to at least 3% of GNP. For Tanzania, this corresponds to Tshs 508 billion in 2006 prices. This is a loss which Tanzania can ill-afford it therefore is important that efforts to reduce road carnage should be taken in social, economic and political agenda. Therefore, this shows there is a problem which needs to be addressed and it is the researcher's interest to study the contribution of road safety measures on reducing accidents.

1.3 Research Objectives

1.3.1 General Objective

The main objective of the study was to examine the contribution of the road safety measures on reducing accidents.

1.3.2 Specific Objectives

- i. To identify road safety measures in Tanzania
- ii. To explore the relationship between increase number of vehicles with road traffic accidents
- iii. To examine the level of awareness of the road safety measure on various road users

1.4 Research Questions

- i. What is the road safety measures established to reducing road traffic accidents in Tanzania?
- ii. What is the relationship between increase numbers of vehicles with road traffic accidents?

- iii. To what extent road users understand various road safety measures?

1.5 Significance of the Study

The reason why this study was significant can be explained from three aspects. First, this study added knowledge towards existing stock of knowledge in road traffic accident, and road safety measures. Consequently, this research offered some empirical messages for policy makers, road users and other stakeholders. Second, the results of how to reduce road traffic accidents can inspire the government to take appropriate measures. Third, it was hoped that this study may help researcher to widen capacity of look at issues of public concern.

1.6 Scope of the Study

This study focuses on the contribution of road safety measures in reducing the road traffic accidents. In particularly the study wanted to find out main causes of road traffic accident, establish the relationship between the increase in number of vehicle and the increase in road traffic accidents. Finally, the study was trying to understand awareness level to various road users.

1.7 Organization of the Study

Chapter	Content
Chapter One	The study introduces the problem, background of the study, statement and described the objective of research and research questions to be addressed by the study
Chapter Two	The chapter presented a review of literature and relevant research associated with the problem addressed in this study
Chapter Three	The chapter presents the methodology and procedures used for data collection and analysis.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The main objective of this study is to examine the effects of Road Safety measures in reducing road traffic accidents. The focus is to obtain a greater understanding of the problem of road accidents in developing countries and Tanzania in particular. In this case, this section presents a literature review especially by reviewing the relevant document, books, article, research and journals that have discusses about Road Safety, road accidents particular in the knowledge related to accident rates and trends, causality, effects and the appropriateness of preventive measures that has been taken by the government and other stakeholders. In its specificity, this section aimed to look for available knowledge about the problem for the purpose of identifying a research gap which needs to be filled in by this study.

2.2 Concepts and Definitions

2.2.1 Safety and Road Safety

It is important first to understand the concept safety in order to understand the road safety. Collins English Dictionary (2012) define the concept risk to mean the following; the quality of being safe, freedom from danger or risk of injury, a contrivance or device designed to prevent injury. This means that road safety could be conceptualize as that the condition of being protected against the road traffic accidents. Safety can also be defined to be the control of recognized hazards to achieve an acceptable level of risk. This can take the form of being protected from the event or from exposure to something that causes health or economical losses. It

can include protection of people or of possessions. From this definition it is reasonable to argue that safety comes before a certain risk happened or can be developed to reduce future risk for a certain exposure. Second, this also shows that accidents as one form of risk can be prevented.

2.2.2 Road Traffic Accident

According to Global Status on Road Safety Report (2013) conceptualize that, road traffic accident, occurs when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole. Traffic collisions may result in injury, death, vehicle damage, or/and property damage. A number of factors contribute to the risk of collision, including vehicle design, speed of operation, road design, road environment, driver skill and/or impairment, and driver behaviour. Worldwide, motor vehicle collisions lead to death and disability as well as financial costs to both society and the individuals involved.

2.3 Theoretical literature

2.3.1 Human Factor

There are varieties of theoretical literature concerning the causes of road traffic accidents one among them is account for human error. It is noted that human error is a problem of great concern within complex sociotechnical systems, being consistently implicated in a high proportional of accident and incidents Salmon (2006). Recently, research within the road transport domain indicates that human error contributes to as much as 75% of all roadway crashes. The literature review conducted by Salmon, Regan, and Johnston, (2005) indicated that the key aspects of error management within complex sociotechnical systems include the recognition of

the fallible nature of humans and the inevitability of error occurrence and the enhancement of error tolerance throughout the system. Rather than attempt solely to enhance system safety through the eradication of errors, system should also be made safer by increasing their tolerance of error.

However, they concluded that despite road safety professional's best efforts, safety interventions, strategies, new technologies and countermeasures will never completely eradicate road user's error. Drivers, pedestrian and other road users will continue to make error for as long as the road system exists. It was therefore, concluded that rather than focusing entirely upon removing road users error through training, awareness campaigns and enhanced technology, effective error management in road transport should as a complementary aim, focus on increasing capacity of the road transport system to tolerate error. Therefore, it can be summarizes as follows human factors in road accidents include all factors related to drivers and other road users that may contribute to a collision. Examples include driver behaviour, visual and auditory acuity, decision-making ability, and reaction speed. The feeling of being confident in more and more challenging situations is experienced as evidence of driving ability, and that 'proven' ability reinforces the feelings of confidence. Confidence feeds itself and grows unchecked until something happens a near-miss or an accident

2.3.2 Fuzzy Set Theory

Another theory that explains the road safety measure in reducing road traffic accidents is Fuzzy set Theory which developed by Loft in 1965. The assumption of the theory state that controlling the occurrence of road traffic accidents starts with an

individual through safe driving. Based on this fact he developed the concept of Fuzzy to explain how the human thinking is capable in preventing or influencing the occurrence of traffic accidents. Actually, Fuzzy logic deals with the problems that have fuzziness or vagueness (Reddy et al, 2013). In Fuzzy logic, a particular object has a degree of membership in a given set that may be anywhere in the range of 0 (completely not in the set) to 1 (completely in the set) [4]. Fuzzy logic is basically the way human brain interprets a given data and performs a decision based on this data. The theory suggests that most accidents occur when a person is under mental stress or in the influence of alcohol/narcotics or lack of responsibility (Reddy et al, 2013).

Other researchers have also used the theory to interpret the increase in road traffic accidents in various countries. Massami (2014) is one among them. He offered some explanation on safety and road accidents. The study acknowledges that there has been a drastic increase of road traffic accidents (RTA) in Tanzania. The incidents result into unexpected economic losses (i.e. about 3.4% of the county's Gross Domestic Product). With the use of an insurance system, it is possible to predict such losses before they occur. Consequently, the costs of such losses can be financed and redistributed in advance.

He uses Fuzzy Set Theory to make sense of the safety and road traffic accidents. The theory state that when risks of traffic accidents are evaluated by the road transport safety regulators and the underwriters in motor insurance, there is usually more than one factor that initiates the risk. When multiple risk factors are considered to make a comprehensive decision, a process is called comprehensive evaluation. When

referred to fuzzy factors, it is called fuzzy comprehensive evaluation. In explaining road traffic accidents the theory follow the following steps factor set formulation and evaluation set formulation

Nonetheless, the theory suggest thus, it is useful to collect information on the prevalence rates of road traffic accidents and to find out the relationship between prevalence rates and risk factors of these traffic accidents for auto-insurance and policy formulation. In fact, Massami (2014) uses the risk factors (i.e. causes) of RTA in Tanzania Mainland are established by the Ministry of home affairs-Traffic Police Department. According to the official statistics over the past two decades the major causes of road traffic accidents are: Reckless driving (i.e. Inappropriate speed), Defective Motor Vehicles, Careless Pedestrians, Excessive speed, Careless Motor Cyclists, Careless Pedal Cyclists, Intoxication, Others thatis Bad road, Slippery. Since the boundaries of these influential factors cannot be precisely determined, it is better to treat them as fuzzy factors.

2.3.3 Political Ecological Approach

Like other theory presented above, another theory that can explain the road safety measures in reducing road traffic accidents is Political ecology. The theory addresses the relationship between social, environmental, biological and political factors that is bio-cultural-political complexity, and a significantly humanized nature (James et al 1994). Despite its broad interdisciplinary emphasis, it is possible to delineate two major theoretical thrusts that have most influenced the formation of political ecology. These are political economy, with its insistence on the need to link the

distribution of power with productive activity and ecological analysis, with its broader vision of bio-environmental relationships.

However, the origins of political economy may be found in the works of seventeenth to nineteenth century thinkers such as Hobbes, Adam Smith, Malthus, Ricardo, and Marx. In fact Marx, perhaps, came closest to defining the dialectic between individuals, their productive activity in human society, and nature (Mészáros 1970:104) that political ecology seeks to address by his insistence that one must begin not with abstract premises or dogmas (Marx and Engels 1970 [1846]:42), but with the productive activities of real individuals. This focuses attention on political economy as it transforms and is transformed by individuals and nature. Nature and society are both socially constructed to significant degrees, yet both are determined to some extent by what may be glossed as system-like constraints that are neither the deliberate nor inadvertent products of human purposive activity. This approach can also explain the problem of road traffic accidents.

Applying this theory in road traffic accidents one cannot deny that the hard ship productive activity have increased human distress. On the other hand, most developing countries and Tanzania in particular there is changes in the interaction between individual and nature. Human beings are now depending on selling their labor power; this has influenced most individual and families to become not unit of production rather the unit of consumption. Therefore, while driving people are overwhelmed with thinking and mental distress. This is manifested also in the theory of Loft (1965) who found that mental distress is the main cause of road traffic accidents and Komba (2007) who explain the political ecology as the main cause

influencing the accidents.

2.4 Empirical Literature

2.4.1 Empirical Literature Review Worldwide

Evidence from literature by King, (2005); WHO, (2013) shows that road safety and accidents is also a problem in developed nations. Like other continent the increase in road crashes is associated to increase in motorization. For instance Jacobs (2001); Rassool (2007) noted that Britain's first motorized vehicle appeared on our streets in January 1896. In August 1896, a pedestrian was killed by a car travelling at four miles an hour, becoming the first of Britain's 430,000 road accident fatalities (Mitchell, 1997). In 2002, nearly 1.2 million people worldwide died as a result of a road traffic crash. This represents an average of 3,242 persons dying each day around the world (WHO, 2004). In Britain, the latest Government Statistics (2002) show that over three and a half thousand people die each year on our roads. In a similar manner Jacobs (2001) in 1974, in those countries of Europe making returns of road accidents to the United Nations, 90,000-persons were killed and 1,800,000 injured by motor vehicles. In In the same year in the United States over 55,000 were killed. Despite the enormity of these figures, road deaths and injuries seem to have very little impact on the general public.

Contrary to other part of the world it is noted that in developed world the trend and incidence of road traffic accidents are decreasing. International Transport Forum (2013) report that, in 2011, there was a 1.1% decrease in the number of fatalities in Argentina; however, the number of injury crashes increased by 11%. On the other hand, according to provisional data, there were 4 923 road fatalities in 2012, a 2.3%

decrease in comparison with 2011. It is noted that motorization is growing very fast in Argentina. The car fleet rose by 860 347 units in 2011, i.e. a 6% increase in new vehicles compared to 2010. The motorcycle fleet grew by 541 017 units, i.e. by 15% compared to 2010. The motorcycle fleet is growing twice as fast as the car fleet. In recent years there have been significant changes in relation to road crashes in Argentina. The data shown below reveal a downward trend in total road fatalities between 2008 and 2011. There was a 12.5% decrease in total road deaths and an 11.8% decrease in the number of people killed at the scene of the crash. Between 2008 and 2011, the mortality rate, expressed in terms of deaths per 100 000 inhabitants, decreased by 15% and the fatality rate, expressed in terms of the number of fatalities per 100 000 registered vehicles, decreased by 29%.

In the last three years, the reduction in fatalities has accelerated. Effective safety measures, tough winter conditions in 2010 and 2011, and possibly the economic downturn might explain this sharp decrease in fatalities. Also, a possible change in speed habits may have had some influence. There is some indication that although mean speeds only slightly decreased, the top speeds have reduced more significantly. This may be more to do with saving fuel than saving lives in traffic. Fuel has become expensive. Therefore, these are some of the examples indicating that road safety measure is critical in reducing road traffic crashes

2.4.2 Empirical Literature Review in Africa

In comparison with the countries of Western Europe and North America, developing countries are also experiencing the problem of road safety. Like developed countries, the increase in road traffic crashes is also associated with the increase in

motorization. It appeared that with the rapid expansion of motor vehicle use in developing nations, road traffic related deaths and injuries are rising sharply TRB (2006). It is reported that More than 1 million people died from road traffic crashes in low- and middle-income nations in 2000; according to the World Health Organization (WHO) that number could nearly double by 2020. The most affected population are children especially aged between 5 to 29, and 96 percent of those killed lived in low- and middle-income countries. Beyond the human toll, road traffic injuries impair the growth and development of low- and middle-income countries by draining at least 1 percent of their gross domestic product, or \$65 billion annually.

Like other researcher, Aderamo (2012) have also studied about Road Traffic Accident Injuries and Productivity with a view towards reducing the incidence of Road Traffic crashes and improving road safety. The results show that a clear relationship exists between road traffic accident injuries and productivity. He noted that the increase in road traffics crashes affect the labour sector. Finally, recommended the need to improve road safety in the country. This implies that road traffic accidents contribute to poverty by causing deaths, injuries, disabilities, grief, and loss of productivity and material damages.

All the same, WHO (2004) studied about road safety in developing countries. The findings show that over 3000 Kenyans are killed on our roads every year, most of them between the ages of 15 and 44 years. The study continues to note that the cost to economy from these accidents is in excess of US\$ 50 million exclusive of the actual loss of life. In fact the WHO were also iterated to investigate the social and economic impact emanated from the said road crashes. It is noted that Kenyan

government appreciates that road traffic injuries are a major public health problem amenable to prevention. In 2003, the newly formed Government of the National Alliance Rainbow Coalition took up the road safety challenge. It is focusing on specific measures to curtail the prevalent disregard of traffic regulations and mandating speed limiters in public service vehicles. Along with the above measures the Government has also launched a six-month Road Safety Campaign and declared war on corruption, which contributes directly and indirectly to the country's unacceptably high levels of road traffic accidents.

2.4.2 Empirical Literature Review in Tanzanian

Like many other countries, Tanzania also is facing the problem of road safety. Several researcher and institutions have attempted to make sense of this issue in order to come up with ways that could improve road safety in the country. Chiduo (2010) have studies issues related to road safety in Tanzania. The purpose of their study was to investigate the problems that have caused the current road safety situation in Tanzania giving emphasis on the institutional set up of road safety activities, traffic legislation, law enforcement, training and education, vehicle safety and inspection, road traffic management and post collision assistance. Like other researcher, they acknowledge that Road Safety is a serious problem all over the world; its severity is more pronounced in the developing countries, especially in Africa (National Road Safety, 2009).

Tanzania being one of the African countries is no exception in this regard. It is reported that in Tanzania alone the cost of road accidents in Tanzania has recently been estimated at TShs. 20 billion annually. Overloading on the major highways is

20-25% hence being one of the causes of undue damage to the road pavement. They reported that the government of Tanzania has made a commitment to tackle the road safety problem by developing and implementing a comprehensive road safety program with the following objectives: first, to establish a road safety organization capable of managing a multi sectorial integrated approach to the road safety problem. Second, is to improve the quality of life in Tanzania by reducing the frequency of road accidents and minimizing their consequences. Finally, to improve undue damage to road pavements through stringent vehicle and axle load control.

The findings of their studies support the main objective of this study because their study revealed that road safety measures put forward by the government to reduce road traffic accidents have failed. This is manifested in the increase in frequency of accidents over the past ten years. The fact that developed world have managed to minimize the frequency of accidents, strengthens the will of this study to examine the effects of road safety measures in order to reduce road traffic accidents. Actually, this study shared with Madiro et al, (2013) that the problem of road traffic accident needs to be analyzed within a multiple dimension such as the rapid increase in urbanization, poor traffic management and corruption. According to them these factors are some of the forgotten dimension in the study about road safety and traffic accidents. They concluded that improving traffic signals, penalty and vehicle inspection. However, these factors cannot be generalized because they extracted in the context of Zimbabwe.

Likewise, Mwakapasa (2011), have also researched about road safety in Tanzania, the main objective of his study was to find out ways of minimizing the consequences

of motorcycle accidents in terms of mortality and disability. The findings of his study noted road safety measures are ignored by road users especially motorcycle drivers such as non-helmet use. He fatherly noted that motor cycle riders they perceive that use of helmet increases rather than decreases the risk of an injury by reducing field of vision and creating discomfort.

Other reasons for not wearing helmet include the idea that helmets are necessary for the drivers of powerful engine motorcycles that travel in a high speed and not necessary for moped and scooter drivers; inconvenience of carrying the helmet as it could be stolen if left on the vehicle, and the inconvenience of removing it now and then for taking calls on the hand-held mobile phones while driving. However, not wearing Helmet is only a single factor, therefore, his findings cannot be generalized because road transport used by various means of transport. Second, the study did not show how they interpret the increase in road traffic accidents but also if they don't want to use helmet what kind of safety measure they have proposed instead.

Apart from above expression, SUMATRA (2007) also raised concern about road safety in the country; the concern influence this institution undertakes the study in said topic. The overall objective of the study was to propose short, medium and long term measures which will minimize the occurrence and consequences of road traffic accidents, effective road traffic legislation and its enforcement and to develop an effective and efficient road traffic accident database accessible to all stakeholders. It is reasonable to argue that neither road safety measure, nor road traffic accident have not well understood in Tanzania. In this case, implies that urgent study is needed to examine the road safety measures. This is due to the fact that the study by

Mwakapasa (2011) conducted at four years after SUMATRA proposition of short and long term measures to reduce road traffic accidents.

The assumption of this study is that understanding factors influencing occurrence of road traffic accident can lead to better creation and understanding of road safety measure. Like other researcher SUMATRA also acknowledge that the number of reported RTA has been increasing in spite of the stakeholders' efforts through the National Road Safety Council (NRSC) and other government sporadic initiatives. Loss to the economy due to Road Traffic Accidents (RTA) was estimated to be 2% of the GDP in 2002. Because of these facts, the Surface and Marine Regulatory Authority (SUMATRA), as a regulatory body of the sub-sector perceived the need to have a clear assessment of the RTA problem. This shows there is a problem in road safety measures that need to be addressed.

2.5 Research Gap

A critical literature review made for this study have identified several gaps that need to be addressed which this study will accomplish that task. First of all, there is an inadequate study that has researched the effects of road safety measures in Tanzania. At the same time few studies reported that road safety measures are ignored, but this is presented in the context of motor cycle (bodaboda) drivers who reported don't want to use helmet. The assumption of this study is that road safety measures cannot be explained by motor cycles only; there are more road transport users as well as road safety indicators. Second, the impacts of corruption in road safety measures in reducing road traffic accident have not explored in the context of Tanzania. Also, there is inadequacy information on how poor traffic management affects the road

safety measures and lastly in discussing the causes of road traffic accidents structural factors have given more emphasis than human factors

2.6 Theoretical Framework on Political Ecology

The reviewed literature and the research gap identified influences researcher to theorize the problem understudy within the context of political ecology. The rationale of using this approach, it is because the approach applies multicity of factors to understand a single event. In human geography Political ecology approach was introduced by Blaike and Brookfield (1987); Zimmer, (1996). They explain that political ecology is the combination of both ecology and political economy. In a similar manner, Mayer (1996) introduced the political ecology of a disease concept which focuses on the relevance of political and economic factors at different geographical levels in the study of health and diseases in a locality, actually, this could also extended to the study of health and road accident as well. It is important to note that although politics is not the direct concern of geography, but plays an important role in determining the way in which people view and utilize the recourses and opportunities available to them (Mayer, 1996).

In fact, the above illustration on political ecology is relevant in understanding road safety measures in reducing road traffic accidents at local scale. This is strongly linked to available recourses and capacity of the national and local authorities to put road safety strategies in place. The assumption is shortage of resources and power to follow up on control and enforcement can result in lower motivation of police force. This is because government policy does have an influence on all the factors that cause traffic accidents, be it the quality of the road network, the associated physical

environment , traffic engineering , the condition of vehicle or vehicle fleet stock or the behaviours and attitudes of road users. At international scale the political ecology approach is relevant in relation to the distribution of resources, health, risk and poverty based on international trade relations. This relationship for example, can be expressed in the import of second hand vehicles for private as well as public transport from the developed countries. Sometimes this could be Importation of vehicles nearly regarded as non-road wealth in the view of the exporter in the developed country.

Political economy is concerned with issues of power, influence and authority. Thus the content of political ecology emphasizes that human-environment relationship at local, regional, and global scales can be understood only by analysing the relationships of patterns of resource to political economy forces Basset(1988 cited in Mayer,1996) notes that, among other characteristics which are implicit in the political ecology approach include the important of historical analysis in understanding local dynamics, and the effects of state policies and activities on the local scale The build-up environment can also influence the occurrence of traffic accidents in a locality. Planning for road construction to aid development should take into account the width of the road and the lay out of the junctions. Whether black spots will be improved or not rest on the shoulders of the state and further more regional or local authorities.

On the other hand, Mayer (1996) notes that the effect of state policy and action are inherent in political economy, and are therefore a major concern of political ecology. Political ecology and health are closely linked in the sense that, it provides a useful

perspective for gaining an understanding of human-environment interaction to cause an increase or decrease of traffic accident at various geographical levels (central versus local) and in different areas in developing countries. Therefore, with regards to the problem of road traffic accidents in Tanzania political ecology approach helped to associate and integrate human-environment factor at local level and the effects of road safety measures in reducing the accidents

2.7 Conceptual Framework

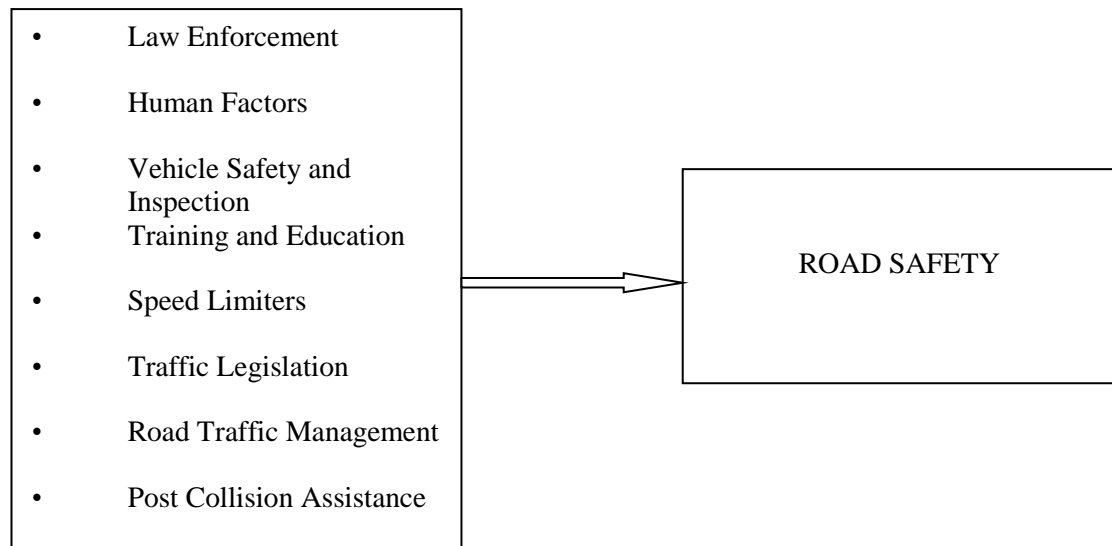


Figure 2.1: Conceptual Framework

Source: Researcher, (2015)

The diagram indicated above shows that there are multiplicities of factors which determine the road safety measures especially in reducing road traffic accidents. As shown in the outlined concepts in the box at the left side, they are representing the independent variables while the right side box with road safety is dependent variable. This implies that road safety as a single needs a multiplicity of factors in

order to be understood. On the other hand, this shows that the occurrence of road traffic accidents is influenced by many factors.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This section presents the research methodology for this study. The description includes research design, study area, population of the study, sampling techniques, sample size, and method of data collection

3.2 Research Philosophy

This study built upon interpretive research philosophy in studying the road safety measures that can reduce road traffic accidents. The rationale for applying this kind of philosophy is the fact that it is seeking to bring about change or address social issues in society (Carnaghan, 2013). Second, its approach offers the understanding of the world in which we live and work the development of multiple meanings, the researchers look for complexity of viewpoints. It allows researcher to ask broad general open-ended questions; Focus on the 'processes' of interaction; Focus on historical and cultural settings of participants; Acknowledge their background shapes interpretation, 'Interpret' the meanings others have about the world (Carnaghan, 2013).

3.3 Research Design

Research design is defined as the clearly defined structures within which the study is implemented (Burns & Grove 2001:223). The exploratory research design was employed to suit the phenomena under study (the effects of road safety measures in reducing road accidents). The assumption was that the problem of road traffic accident has not clearly defined. Normally exploratory design helps in understanding

the nature of problem. The major emphasis in such design is on the discovery of ideas and insights. In his case qualitative approach was used in data collection. The approach was used because the study is interested in explanation that could capture informant attitudes, perception, opinion and their understanding of the road safety measures in reducing road traffic accidents. The other reasons was that the statistics of the increase road accidents are available, but there was inadequacy explanations on why this phenomenon is on increasing

3.4 Study Area

The study conducted in Dar es Salaam region especially in Kinondoni. Dar es Salaam is located at 6°48' South, 39°17' East. It is located at the eastern side of Tanzania and it is bordered by the Indian Ocean at its eastern side and encapsulated by the Coast region. It has the biggest, fast growing city of Tanzania, and a population of about 4 million people of different cultural backgrounds from all over Tanzania. Administratively, it has three districts, namely Kinondoni, Ilala and Temeke. It is connected with the neighbouring regions through four main roads, namely Morogoro, Nyerere, Kilwa and Bagamoyo. Dar es Salaam is the largest city in the country, and is comprised of different types of people with different values, beliefs, and cultural background. The study of commercial motorcyclists in Dar es Salaam could be generalized to all commercial motorcyclists within Tanzania.

Kinondoni Municipality is the northernmost of three municipalities in Dar es Salaam, Tanzania. The 2002 Tanzanian National Census showed that the population of Kinondoni was, 1,083,913. The area of Kinondoni is 531 km².the latest population

census of 2012 showed that population of Kinondoni was 1,775,049: 914,247 female and 860,802 male. There are 446,504 households in Kinondoni with the average of 4 people per household. The original inhabitants of Kinondoni were the Zaramo and Ndengeleko, but due to urbanization the district has become multi-ethnic

3.5 Study Population and Sample Size

Population is defined by Polit and Beck (2004:50) as the aggregate or totality of those conforming to a set of specifications. A total number of 50 key informants were interviewed. Researcher recruited them from Traffic Police, Drivers, motorcycle driver's, pedestrian and driving schools. Researcher was aware that in qualitative research the calculation of participants is determined by saturations of answers provided by the key informants. This due to the fact that not all respondent have equal chance to participate in the study, but only participant who are knowledgeable about the topic under study.

As noted by Ritchie, Lewis and Elam (2003) provide reasons for this. There is a point of diminishing return to a qualitative sample as the study goes on more data does not necessarily lead to more information. This is because one occurrence of a piece of data, or a code, is all that is necessary to ensure that it becomes part of the analysis framework. Frequencies are rarely important in qualitative research, as one occurrence of the data is potentially as useful as many in understanding the process behind a topic (McKenzie, 2006). Therefore, the number of informant may increase based on the coming data from respondents. However, categories and criteria has described in the table 3.1.

Table 3.1: Sampling Frame

Types of group	No. of key informant	Sampling techniques
Traffic Police	5	Purposive
Drivers of Public Transport	15	Purposive
Motorcycle Drivers	15	Random
Pedestrian	10	Random
Driving schools	5	Random
Total	50	

3.6 Sampling Techniques

Sampling refers to the process of selecting a portion of the population that conforms to a designated set of specifications to be studied. A sample is a subset of a population selected to participate in the study (Polit & Beck 2004:731; Uys & Basson 1991:87). A purposive sampling method was used, which is most common in phenomenological inquiry.

According to Brink (1996:141), purposive sampling requires selecting participants who are knowledgeable about the issue in question, because of their sheer involvement in and experience of the situation. While Creswell (2003:185) states that purposive sampling refers to selection of sites or participants that will best help the researcher understand the problem and the research question, they must be willing to reflect on and share this knowledge. Traffic Police, drivers, driving schools and few pedestrian were found to be the best source of rich and valuable information regarding their experiences in managing low enforcement, driving, travelling and teaching drivers at various levels. Participants were selected based on

their particular knowledge of the phenomenon, for the purpose of sharing their knowledge, experiences with the researcher (Strebert and Carpenter 1999).

3.7 Method of Data Collection

3.7.1 In-depth Interview

An in-depth interview is a qualitative research technique conducted in a form of conversation/discussion between researcher and respondent (person to person discussion) with the purpose of exploring issues or topics in great detail (Babbie, 2010). The interviewer encourages participants to freely discuss their feelings and opinions, and probes on questions to gain insight and depth to responses. This type of interview is often unstructured. Therefore it permits the interviewer to encourage participants to talk at length about the study topic, hence to increase insight into people's thoughts, feelings, and behaviour's.

This method was used to interview the Traffic Police, drivers and driving school. According to Saunders et al. (1997; 215), Schindler, P.S. (2001) with semi-structured interviews the interviewer guided by a set of questions or themes and attempted to establish rapport with the respondent to produce richer data. The advantage of a semi-structured interview is the flexibility in obtaining information based on themes such as characteristic of road traffic accident as happening in Dar es Salaam city, causes and effects of road traffic accident in Dar es Salaam city and the relationship between society, economy and ecology. It also provides the opportunity to probe answers, to build on the interviewees responses and to address the sub problems under study. A pilot survey was conducted to ascertain the level of reliability, validity and ambiguity in respect of understanding the issues and the responses.

3.7.2 Documentary Review

In this study the documentary review was used as a source of secondary data. Several documents are reviewed ever since it is impossible to review all of them. The review involves reports carried out by individuals and organizations on the problem understudy. The purpose was to generate concepts and theoretical knowledge available and to prepare research instrument and field observation.

3.7.3 Observation

This study applied observation as method of data collection. This conducted in the form of non-participant observation. In this method researcher observed things such as driving behaviour, adherence to road traffic signs and the use of speed required and other issues that can be seen physically and interpreted.

3.7.4. Questionnaires

List of a research or survey questions asked to respondents, and designed to extract specific information. In this study a researcher was interested to know the magnitude of the phenomenon under study, questionnaire as the method of data collection used. The questionnaire used to collect data which then analysed by SPSS software to show the magnitude of the problem.

3.8 Methods of Data Analysis

According to Streubert and Carpenter (1999:60), data analysis begins with listening to participants' verbal descriptions, and is followed by reading and re-reading the verbatim transcriptions or written responses. Data analysis was conducted using Tesch's method of analysis of qualitative data, and the steps are such as listened to

audiotapes and had also read and re-read all the transcriptions. This was done to get a sense of the whole data, and some ideas were jotted down as they emerged. One transcript of the interview was picked at a time and re-read. list of topics was made, and then similar topics were clustered together. Thereafter, columns were drawn to form major topics, unique topics and leftovers (i.e. those that fitted into major topics/categories and those that did not fit into either of the categories).Also the Statistical Package for Social Science (SPSS) software version 16.0 had been used in analysing quantitative data.

3.9 Reliability and Validity of Data

The study ensured the principles concerning validity and reliability of the data are observed. The rationale is that even if other researcher will use the same measurement findings will produce the same result. On the other hand, the concepts will be discussed within the theoretical context.

3.10 Ethical Implications

The researcher considered every requirement of research ethics to establish trust with the participants and to respect them as autonomous beings, thus enabling them to make sound decisions (Bush and Grove 2003, p.65). Ethical measures are as important ensuring the validity and reliability of the data collected. Other ethics to be considered informant consent, confidentiality, anonymity, privacy, dissemination of results, by ensuring the respondents that, the information provided were going to be used in research purpose only, and the respondents have the right to withdraw from the study partially or completely.

CHAPTER FOUR

4.0 STUDY FINDINGS, ANALYSIS AND DISCUSSIONS

4.1 Introduction

The chapter presents the findings of the study; the findings are analysed in relation to the objectives of the study and formulated research questions which guided the study. Data presented in this study were analyzed so as to examine the effects of road safety measures in reducing road traffic accidents. More specifically the study aimed at examining measures established to reducing road traffic accidents in Tanzania, establishing the relationship between increase numbers of vehicles with road traffic accidents and also to examine the extent to which road users understand various road safety measures. The chapter comes up with the observation and findings which had been grouped into three sections; the first section about the reliability and validity of the study, second sections provides characteristics of respondents while the last section dwells a specific findings as related to the study objectives.

4.2 Reliability and Validity

4.2.1 Data Reliability

Data reliability refers to the data collected by independent collector and if the same questionnaire is administered by another person will yield the same results. In this study the reliability test was used to determine which factor or item to be analyzed, discussed and used for chi square test. To increase reliability, each respondent was given preamble sample describing the objective of the study and its implications. Respondents were asked to be free and anonymity was preserved. Furthermore, the researcher used the Cronbach's Alpha to test the reliability of the data. Cronbach's

Alpha test was used to assess the reliability of the scale where a cut-off point of 0.70 was adopted so that the corrections between items of particular scale were improved. The following test was used to check the Alpha degree:

Table 4.1: Reliability Test

Chronbach's Alpha	N of Items
.914	14

Source: Data analysis (2015)

According to this study, the reliability co efficiency using Cronbach's Alpha is 0.914 as shown in table above. According to George and Miller if the Cronbach's Alpha test gives result of more than 0.70 the data under concern are reliable. This Alpha shows excellent level of reliability thus ensures reliability on the data collected.

4.2.2 Data Validity

Data validity refers to correctness and reasonableness of Data. The stakeholders' responses were verified for correctness and reasonability. Each questionnaire obtained was checked for validity and if necessary those unfilled questions or invalid selection respondents were asked to specify what actually was the intention. The verified questionnaire responses were then entered in window SPSS in coded form. This statistical/software package was set with some validation rules for some fields. The entries were printed and verified to ensure that only reasonable and correct entries are captured. All errors were corrected before data analysis.

4.3 Characteristics of the Respondents

4.3.1 Description of the Study Area

The study conducted in Dar es Salaam City. The population of Dar es salaam 4,364,541 according to the official 2012 census, increasing at 5.6 per cent per annum from 2002 to 2012, making it the third fastest growing city in Africa and (ninth in the world) after Bamako and Lagos respectively. The metro population is expected to reach 5.12 million by 2020. Urban public transport users in the city mainly depend on road transport services. Reliance on road transport coupled with high growth of transport demand has led to inadequate supply of transport services and increased dependence on the use of private cars and consequently road congestion and poor traffic flow management (Kumar et al, 2008). Provision of urban public transport services by private sector is underlined at policy level (Ministry of Infrastructure Development, 2003). Dar es Salaam is one among the leading city in road traffic accidents.

4.4 Findings as per Research Objectives

4.4.1 Main causes of Road Traffic Accident in Dar es Salaam

There has been an increasing in Road traffic accidents in the city of Dar es Salaam and Tanzania in general. Noticeably, the impact of this increase affects individual, family and society in general. The notable effects are such as increasing people with disabilities, death, and destruction in property and decline in economic development. Therefore, one of the questions put forward by researcher to the key informants was what are the main causes of road traffic accidents in Dar es Salaam city? The purpose of this question was to test respondent's awareness on the various causes of

road traffic accidents happening in the countries before getting them to discuss about the road safety measures they are aware of. The data related to it are presented in Table 4.2.

Table 4.2: Percentage Distribution on the Main Causes of Road Traffic Accidents in Dar es Salaam

	Frequency	Percent	Valid Percent	Cumulative Percent
Human factors	25	50.0	50.0	50.0
Infrastructural factors	12	24.0	24.0	74.0
Mechanical factors	8	16.0	16.0	90.0
Situation factors	5	10.0	10.0	100.0
Total	50	100.0	100.0	

Source: Data Analysis (2015)

Table 4.2 revealed that more than 50.0 percent of them mentioned about human factors as major causes of road traffic accidents and 24.0 percent of them mentioned about infrastructural factors. Similar to that, about 16.0 percent of them argued for mechanical factors and at least 10.0 percent of them consider situational factors contributes to the emergence of road traffic accidents. In explaining about human factors, it was revealed that lack of driving education and training is one among major causes of road traffic accidents. Throughout the analysis of data it was revealed that, majority of drivers learnt their driving on the street not in driving schools. Therefore, they lack necessary knowledge and skills related to road safety.

Most people are initially trained to drive by driving friends, relatives, or a combination of these, in order to obtain their driver licence. Basing on the research findings it implies that, drivers training and education is one among the road safety

measure. Hence, it equips drivers with relevant knowledge and skills related to safe driving and road safety measures. Though not always, but these skills helps in the reduction of traffic accidents. Obviously, it encourages the development of safe driving techniques, involving road laws knowledge necessary in the prevention of road traffic accidents. Furthermore, basic driver training works at an instructional level. The assumption of this study was that the best learning environment for the beginning driver is the real road system under the supervision of an experienced driver.

The findings of the study also revealed several major problems related to provision and management of driving licence. It is noted that there are weaknesses in the provision of driving licence. People have driving licence though they do not know even how to drive at the same time their age are below 18 years old (Pedestrian reported; Traffic Police reported, August 2015) clearly, it implies that the effects of age and experience are very important for the outcome of both the learning period and the time as a novice driver. The assumptions of this study is, the older driver is when she/he obtains a license, the lower the risk of initial crash involvement as a novice driver. In fact, this study concur with Anders (2007) who noted that the rate of road traffic accidents decreased with age and with increasing experience of the driver.

Apart from what has been presented above, alcoholism while driving have also emerged as major causes of road traffic accidents. A number of road crashes reported were influenced by the alcohol taken by drivers. This was extracted in five among the key informants participated in this study. These informants claimed that

many incidences of road traffic accidents in Dar es Salaam influenced by alcohol taking either while driving especially the driver of public transport and or overdrunk and drive back home to individuals. Almost Traffic Police, Pedestrian, Drivers and Passenger reported on this issue. The analysis revealed that, alcohol influences over speeding among driver, as a result they fail to control their car when see another car in their front or people

Drinking too much alcohol leads to serious physical and mental illnesses, because a major reason for drinking alcohol is to change mood or change the mental state. When one have alcohol in the blood, the mood changes, and subsequently behaviour then also changes. This implies that, alcohol depresses the central nervous system, and this can make us less inhibited in the behaviour. The forgoing was also reflected in one among the participants who described the consequences of alcoholism to driving behaviour. They said when driver take alcohol become over confidence and finally violates the road safety measures. They do not follow necessary procedures and laws guiding the driving behaviour such as how and when to overtake. They do not stop in areas with zebra while they see pedestrian want to cross the road. It was revealed that dangerous driving caused about 2480 of road accidents annually, while careless driving causes about 2755 of road accidents annually

Basing on the explanation provided by the informants, it is clear to argue that law enforcement is one among the road safety measure in reducing road traffic accidents. Poor enforcement of the law influences the increases of road crashes. However, the poor enforcement is connected to corruption. Drivers violate laws guiding road safety measure because they know that will bribe the traffic police. On the other

hand, it implies that drivers driving in cities such as Dar es Salaam have high rates of violation of road safety measure than those in none- cities.

In the similar manner, Infrastructural factors also arouse in the discussion about the major causes of road traffic accidents in Dar es Salaam city. The first theme appeared while discussing with key informants involved the manner in which the city has planned. It was noted that poor planning of the city affected the arrangement of transport infrastructure. The analysis of the findings revealed that the causes of road traffic accidents cannot be explained by human factors alone, poor infrastructure also contributes to the problem. At most all drivers reported many roads in Dar es Salaam are below standards although the city is experiencing major growth and transformations.

It was noted with concern that, limited road infrastructures influence the occurrence of road traffic accidents in the city. The study revealed that this problem is caused by poor city planning. It was noted with concern that, all types of transport concentrated in one location where government officials allocated. This problem triggers large number of cars to concentrate in one location as a result number of road crashes are increasing. The participants especially drivers suggested that the city now needs to improve its road and feeder road in order to minimize road traffic accidents

It is imperative to argue that the growth of Dar es Salaam city does not match with the development of transport infrastructures. In particular, this leads to poor traffic management in the city. To date, Dar es Salaam city has only 260 kilometres of trunk roads, 542 kilometres of regional roads and another 578 kilometres of feeder

roads. These are too small to the growing city like Dar es Salaam as a result the city witness a number of road traffic accidents daily.

Throughout the analysis of data, the findings of study also revealed that the limited space for vehicle packing is among the causes of road traffic accidents in the city of Dar es Salaam. It was reported that difficulties in packing spaces leads to poor packing along the main roads where in the process of overtaking another vehicles the accidents occurs. This will continue to influence the occurrence of road traffic accident in the city because it is reported that vehicle ownership in the city is higher and getting increases. One of the main factors contributing to the increase in road accidents is the growing number of motor vehicles. The problem is not just the growth in numbers and increase in exposure to the risk but also ensuring that appropriate road safety measures accompany this growth. The motor vehicle, along with the subsequent growth in the number of motor vehicles and in road infrastructure, has brought societal benefit but it has also led to societal cost, to which road traffic injury contributes significantly. Without proper planning, growth in the number of motor vehicles can lead to problems for pedestrians and cyclists. In fact, where there are no facilities for pedestrians and cyclists, increasing numbers of motor vehicles generally lead to reductions in walking and cycling.

Contrary to that, the findings of the study revealed that another immediate cause of a road accident may also be attributable to mechanical factor and carelessness in the form of omission to check and maintain the vehicle at the appropriate time. Road traffic accident is therefore an unexpected phenomenon that occurs as a result of the operation of vehicles including bicycles and handcarts on the public highways and

roads. The analysis of data was noted that poor maintenance of vehicles also contributes to the occurrence of road traffic accidents.

While human error is found to be the most frequent contributing factor to road traffic accidents, vehicle defects are reported as playing a role. In general, this implies that the occurrences of accidents are associated with a number of causality ranging from road users, vehicles, road layout and environmental conditions. Noticeable, this also happens in other countries especially the developing countries. As noted by Bekibele, (2007) of which this study concurred, revealed that in Nigeria mechanical factor contributes for about mechanical fault (50%), and bad road (12.5%). In similar manner Vogel and Bester, (2005) from Pretoria in South Africa have noted the same. Their study revealed that, human factors accounts for (95%) to RTA while road environmental factor for (28%) and mechanical factor for (8%). Furthermore, the forgoing has also noted in the New Delhi India, where Archana Kual *et al*, (2005) reported that the important factors for RTA are human errors, driver fatigue, poor traffic sense, mechanical fault of vehicle, speeding and overtaking violation of traffic rules, poor road conditions, traffic congestion, and road encroachment.

4.4.1 Driving Behaviour in the City of Dar es Salaam

Driving behaviour plays a crucial role in maintaining the road safety measure ¹and prevention of road traffic accidents. It is clear that Driver behaviour is what the driver chooses to do with knowledge, skill, perceptual and cognitive abilities, have

¹ As used in this study, Road traffic safety refers to methods and measures for reducing the risk of a person using the road network for being killed or seriously injured. The users of a road include pedestrians, cyclists, motorists, their passengers, and passengers of on-road public transport, mainly buses and trams.

while driving. The reason why drivers choose different speeds is among the important issues to consider. The ability to judge speed, and the capability to control the vehicle at that speed, are aspects of driving behaviour. In this case, it is reasonable to argue that, the speed chosen is at the core of driver behaviour. Drivers behaving in such a way would enhance safety. With this raised importance, the study was investigated about driving behaviour. The data related to it indicated in Table 4.3.

Table 4.3: Percentage Distribution in Driving Behaviour in the City

	Frequency	Percent	Valid Percent	Cumulative Percent
Good	4	8.0	8.0	8.0
Somehow good	8	16.0	16.0	24.0
Poor	38	76.0	76.0	100.0
Total	50	100.0	100.0	

Source; Data analysis (2015)

Drawing from table 4.3, it is revealed that 76.0 per cent of respondent replied that the condition of driving behaviour is poor while 16.0 per cent responded that the condition is somehow good and only 8.0 per cent of them replied that the conditions is good. In particular, throughout the analysis of data, it is noted that drivers of public transport such as Daladala are leading in showing bad driving behaviour. For instance, they can stop their vehicle whenever they see passenger without considering who comes back and at what speed.

A number of accidents have been occurred because of this behaviour. In fact, they do not have tolerance. Basing on this fact, it follows that road traffic accidents are preventable. In doing so, drivers needs to be well advised to keep their cool in traffic,

to be patient and courteous to other drivers, and to correct unsafe driving habits that are likely to endanger, infuriate, or antagonize other motorists. Be aware of the behaviours resulting in violence. The study found that, one of the poor driving behaviour characterize majority of drivers in Dar es Salaam is over speeding. They normally in a hurry especially Daladala drivers as if they are going into other region while in the city after 3 minutes have to stop and either drop the passenger or take the other passengers

Throughout the analysis of data it was noted that driving behaviour takes many forms. Typical it includes speeding, driving too close to the car in front, not respecting traffic regulations, improper lane changing or weaving. It was further revealed that most people drive aggressively² from time to time and many drivers are not even aware when they are doing it. It should be noted that careless, inattentive, distracted, or negligent driving involves failing to exercise normal care, or endangering people or property, while driving a vehicle. Furthermore, the study revealed that most of traffic fatalities involve behaviours commonly associated with aggressive driving, such as speeding, running red lights, and improperly changing lanes. Similar to that, many of traffic injuries result from aggressive driving.

4.4.2 Road Safety Measures

Another area of concern to this study was the issues related to road safety measures.

It should be noted that road safety is a major issue affecting the road sector. To date,

² A driving behaviour is aggressive if it is deliberate, likely to increase the risk of collision and is motivated by impatience, annoyance, hostility and/or an attempt to save time. This definition was provided by A Global Web Conference on Aggressive Driving Issues organized in Canada in October 2000 offered the following definition

road accidents remain a serious problem to sustainable human development in the country like Tanzania. It should be noted that, road traffic accident continue to be an important social and economic problem in Tanzania and other developing countries. This implies that the growing problem of road traffic injuries requires sustained implementation of intervention measures by different sectors. In doing so, participants were asked questions about the safety measures. The question wanted to test their awareness, understanding attitudes and perception about road safety measures prevail. Data related to it are presented in Table 4.4.

Table 4.4: Percentage Distribution on Road Safety Measures by Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	36	72.0	72.0	72.0
No	8	16.0	16.0	88.0
Don't know	6	12.0	12.0	100.0
Total	50	100.0	100.0	

Source: Data analysis (2015)

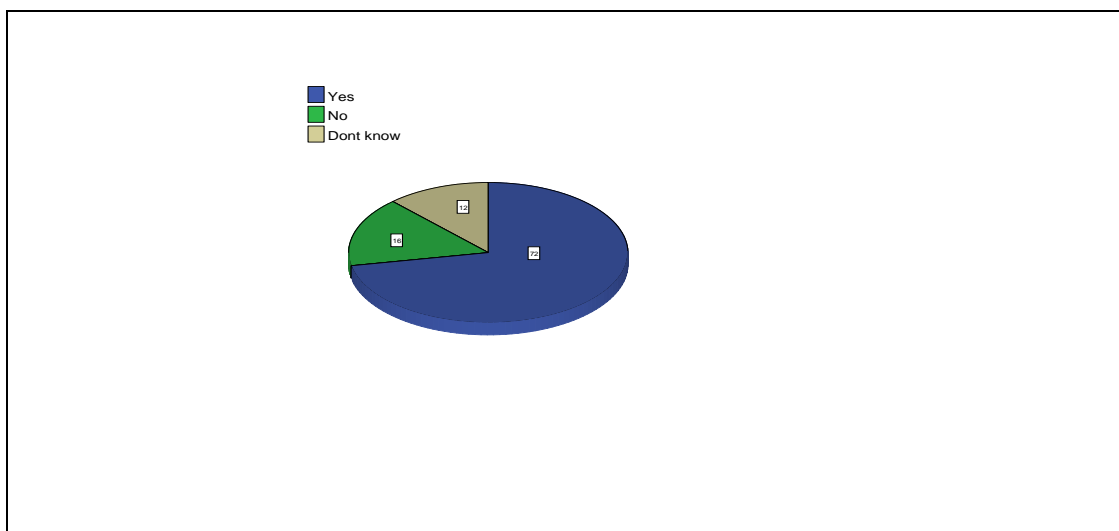


Figure 4.1: Assessing Road Safety Measures by Respondents

Source: Data analysis (2015)

In responding to this question as indicated in table 4.4, almost 72.0 percent of respondents are aware about road safety measures while more than 16.0 percent claimed that they do not know. However, this implies that large number of people is aware about road safety measures. In responding to the question, they mentioned several measures such as don't drink while driving, do not use mobile phone while driving, Zebra (pedestrian crossing) and traffic light. Other mentions include speed signs and vehicle packing signs.

Despite of this awareness but still the study found that, road Safety is a serious problem all over the world, its severity is more pronounced in the developing countries, especially in Africa. Tanzania being one of the African countries is no exception in this regard. As noted by Cuthbert (2009) of which this study agrees with the government of Tanzania has made a commitment to tackle the road safety problem by developing and implementing a comprehensive road safety program aiming at establishing a road safety organization capable of managing a multi sectorial integrated approach to the road safety problem. Additional to that it was aimed at improving the quality of life in Tanzania by reducing the frequency of road accidents and minimizing their consequences. Finally, this establishment aimed at improving the undue damage to road pavements through stringent vehicle and axle load control.

Likewise, the study continues to note that despite of this commitment by the government, the frequency of accidents over the past ten years has increased. The cost of road accidents in Tanzania has recently been estimated at TShs. 20 billion annually. Overloading on the major highways is estimated at 20-25% hence being

one of the causes of undue damage to the road pavement. It was further noted that in Tanzania whilst there are a number of organisations both government and private who are actively attempting to reduce road accidents their efforts have not been coordinated. The National Road Safety Council (NRSC) was established by an act of Parliament to take a lead role in promotion and co-ordinating road safety activities in the country.

4.4.3 Conditions Influences the Violation of Road Safety Measures

Adhere to the road rules helps in prevention of road traffic accidents. There are so many issues related to the traffic rule violations such as wrong sense of driving, which involve drunken driving, over speeding, jumping the red lights, lane violation, and not wearing seat belts. In this case, it is important to promote the road safety awareness targeting the road users especially developing a sense of responsibility about various aspects of road safety. In this regards, the study examined the conditions influences the violation of road safety measures. The data related to it are presented in Table 4.5.

Table 4.5: Percentage Distribution about the Conditions Influences the Violation of Road Safety Measures

	Frequency	Percent	Valid Percent	Cumulative Percent
Drinking and Driving	14	28.0	28.0	28.0
Poor law enforcement	12	24.0	24.0	52.0
Psychological factors	5	10.0	10.0	62.0
Over speeding	9	18.0	18.0	80.0
Limited road infrastructures	10	20.0	20.0	100.0
Total	50	100.0	100.0	

Source: Data analysis (2015)

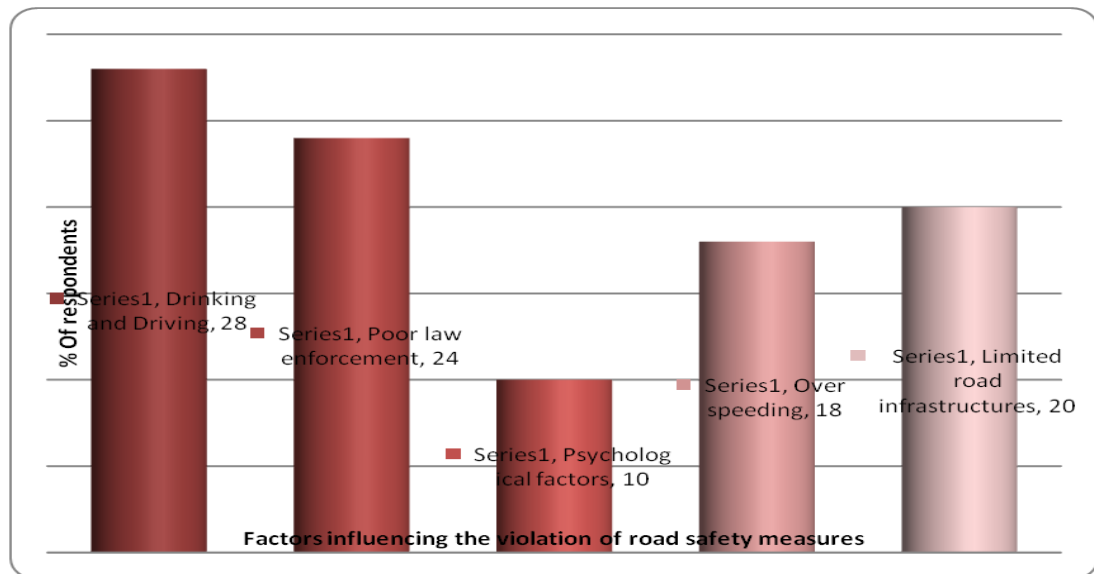


Figure 4.2: Examining the Conditions Influences the Violation of Road Safety Measures

Source: Data analysis (2015)

As evident in table 4.5, it is revealed that 28.0 percent of the respondent sees that the violation of road safety measure contributed by drinking and driving while 30.0 percent of them constitute the limited road infrastructures and at least 24.0 percent of them reported on poor law enforcement and 20.0 percent of them reported on the limited road infrastructures. Additional to that, about 18.0 percent of them reported on over speeding and at least only 10.0 of them reported on psychological factors.

It was noted that people who drink and drive put everyone on the road in danger. It was fatherly revealed that the risk of a driver under the influence of alcohol being killed in a vehicle accident is higher than of drivers without alcohol and driving. It appeared that alcohol distorts a person's perceptions and judgment. People under the influence of alcohol readily admit their reaction time is slower than when not drinking, and they take many chances they would never take when sober. Too often those chances are fatal. *Alcohol affects drivers in a way that changes their*

judgement, depth perception as well as vital motor skills required to drive safely as a result it leads to road accidents (Driving school Instructor reported, August 2015)

Basing on the data presented above, it should be noted that drivers use their hands, eyes, and feet to control the car; but their hands, eyes, and feet must be controlled by their brains. The assumption is safe driving requires alertness and the ability to make quick decisions in rapidly changing situations. Furthermore, the findings of this study suggest that drinking alcohol has a profound effect on driving skills. According to American Association for the Advancement of Science (2010)³ of which this study agrees with revealed that drinking while driving affects the reaction time, i.e. it slows reflexes which can decrease the ability to react swiftly to changing situations. The study continues to note that alcohol decreases the ability to judge the car's position on the road, or the location of other vehicles, centre line, and road signs.

Another factor which influences the violation of road safety measure this study revealed is human psychology. The findings suggest that drivers like any other human beings are naturally prone to territoriality and have the tendency to view their vehicle as an extension of their personal domain. They feel threatened by other vehicles and respond aggressively or out of an instinct of self-protection. This implies that, drivers struggling for power and domination while driving on the roads. This competitive nature influences poor driving behaviour. Some drivers respond to being overtaken by another vehicle as a challenge. This, in turn may lead to showing

³<http://sciencenetlinks.com/interactives/alcohol/ebook/pages/drunken-driving.htm>. Retrieved on Sunday 13th September, 2015 at 19:45

off and racing involving speeds which are well over the speed limit and to drivers making risky overtaking manoeuvres. Another example of competition on the road is drivers who race to get off faster at traffic lights

Moreover, the data generated by this study and the analysis made as evidenced in the participants quoted verbatim presented above, it appears that some incidences of road traffic accidents occurs as a result of drivers competition while driving. It was noted that they compete because wants to be the first, arrive early, and competition for getting first to the station to look for passenger as the case for Daladala drivers. In support to the statement above, while in the field researcher also observed that due to this nature of competition drivers were driving too close to the vehicle in front. In this case braking suddenly would have an impact to the vehicle behind, deliberately blocking the passing lane, using headlights on full beam to punish other drivers, and shouting or making obscene gestures to other drivers.

Law contributes to the ordering of social life. It is a moral mirror reflecting ways of being, social relations and the conceptions of values and rights governing people's behaviour, property and society. However, the findings of the study revealed that there is weak law enforcement related to the road safety measures. The participants during the interview claimed that this phenomenon influenced the development in poor driving behaviour among drivers in the city. The study found that poor law enforcement related to road safety measures resulting bribe and corruption entertained by law enforcers. The study revealed that, it is normal nowadays that Traffic Police witness's driver violates road laws, instead of punishing such drivers, they asks for bribe.

In this case, the findings of the study revealed that punishment is one of the techniques of crime control. However, with the emergence of corruption some law enforcement institutions have changed the meaning of punishment instead crime has becomes the source of income. It is important to point out that connecting crime to economic achievement some institutions have failed to play the role has been serving. On the other hand, the study revealed that road traffic accidents can be prevented because its occurrence is not natural rather human oriented. This means improving road safety measures should go concurrent with fighting against corruptions.

Contrary to poor law enforcement, the findings of the study revealed that there are situational factors that hinder drivers to adhere of road safety measures. Among them is technology such as mobile phones. It was revealed that overconcentration in mobile phone while driving has caused a number of road accidents in many parts of Dar es Salaam city. On the other hand, the use of mobile phone is connected with economic pressures to compress many drivers' conception of time, creating intense pressure to make every minute productive.

Commuting time, for many drivers, is the last frontier of unexploited time, and the perception that commuting time is lost or wasted time contributes to aggressive efforts to shorten commutes. It was noted that, time pressure or urgency to achieve a driving goal such as getting to work or home quickly combines with frustrating factors such as congestion to trigger aggression in antisocial and competitive drivers. Likewise, the analysis of data revealed that, economic pressure influences driver sometimes to violate road safety measures; this is because Dar es Salaam is faced

with the problem of traffic congestion, and therefore, if driver has to follow road safety rule would not reach the target of the boss and our daily bread. This implies that traffic congestion is one of the situational factors in which it is characterized by slower speeds, longer trip times and increased vehicular queuing. The findings of the study revealed that road congestion in the city of Dar es Salaam has now become a common problem that slower the traffic stream. As noted by Steven, (1990) of which this study concurs, he noted that hour traffic congestion is inevitable because of the benefits of having a relatively standard work day.

4.4.4 The Relationship Between Increasing Number of Vehicles With Road

Traffic Accidents

One of the main factors contributing to the increase in global road crash injury is the growing number of motor vehicles. One of the question put forward to the research question was that, is there any relationship between the increases in motorization with road traffic accidents? The question was aimed at getting participants awareness and understanding on issues related to road traffic accidents. In answering this question, almost all respondents claimed that there is a relationship between motor vehicle growth and the number of road crashes and injuries.

It was noted with concern that while the motor vehicle and subsequent growth in the number of motor vehicles and road infrastructure has brought societal benefit, it has also led to societal cost to which road traffic injury contributes significantly. Data related to it presented in Table 4.6.

Table 4.6: Percentage Distribution on the Relationship Between Increasing Number of Vehicle And Road Traffic Accidents

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	41	82.0	82.0	82.0
No	9	18.0	18.0	100.0
Total	50	100.0	100.0	

Source: Data analysis (2015)

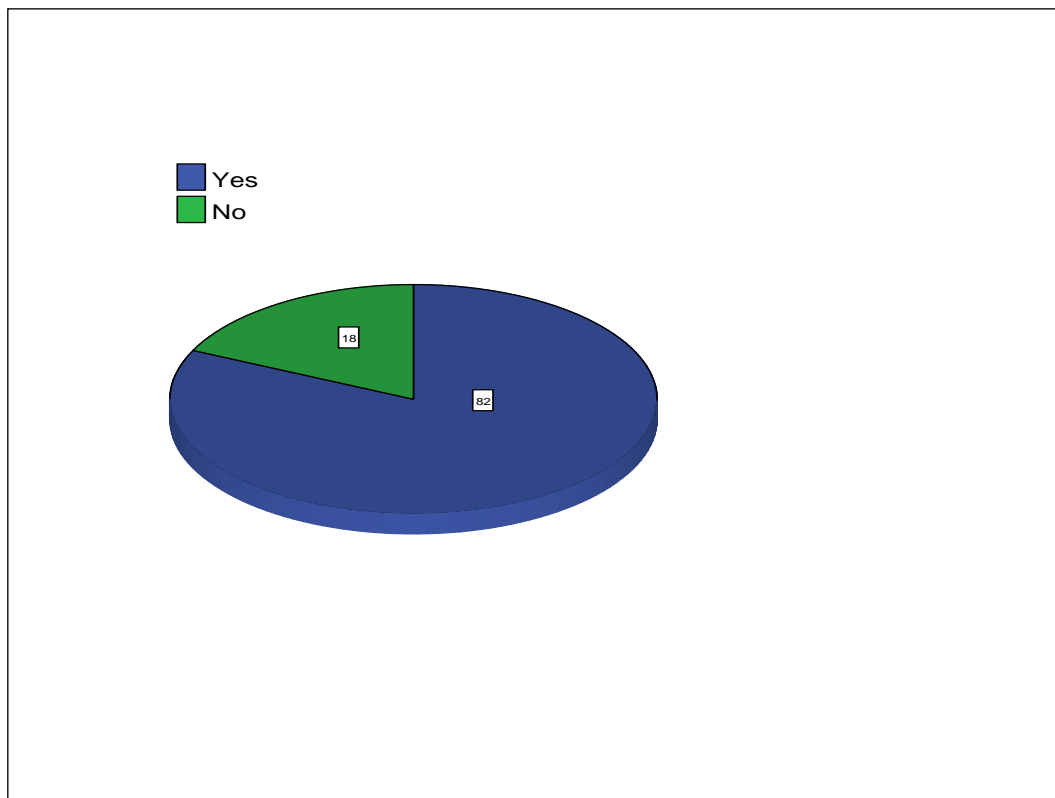


Figure 4.3: Assessing the Relationship Between Increasing Number of Vehicles And Road Traffic Accidents

Source: Data analysis (2015)

As indicated in Table 4.6, it is revealed that more than 82.0 per cent of respondents agreed that there is the relationship between increasing number of vehicles and the occurrence of road traffic accidents. Therefore, throughout the data analysis, it

appears that, the problem of road traffic accidents in Dar es Salaam partly resulted from having higher volume of vehicles with inadequate transport infrastructures. The increase in vehicle ownership in the city not only influences the increases in road congestion of which has become the source of road crash

With the increase in vehicle ownership the study found that, also there is an increase in the rate of road traffic accidents (RTA) in many developing and developed countries. This is attributed in part to urbanization, industrialization, as well as the increase in the number of motor vehicles on the roads. As noted by Taylor(2000) of which this study agrees with revealed that the higher volume of vehicles, the inadequate infrastructure and the irrational distribution of the development are the main reasons for increasing traffic jam and associated road accidents (O' Toole, 2012). The study continues to note that Periods of economic prosperity tend to be associated with increasing mobility and demand for transport services. In times of economic growth, traffic volumes increase, along with the number of crashes and injuries, and there are generally reductions in walking and cycling.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

As indicated in chapter one of this study, the main objective of this study was to examine The Effect of Road Safety Measures in Reducing Road Traffic Accidents. In so doing, the study addresses three objectives and answered several key research questions which were, *one*, what is the road safety measures established to reducing road traffic accidents in Tanzania? *Second*, what is the relationship between increase numbers of vehicles with road traffic accidents? And *finally*, to what extent road users understand various road safety measures? In order to find answers to these questions qualitative research methodology was used in the process of generating data and information related to the topic under study. This approach was necessary in understanding why drivers behave the way they do, capturing people's perception, attitudes about road safety measures and the role played by established road safety measure in reducing road traffic accidents.

5.2 Conclusion

Generally, the study revealed that road transport system is the most important mode of transport in the country. The government and the public are concerned about the safety of the system. Road transport in Tanzania account for about 70% and it is the dominant means of transport of goods and passengers. However as important as it is the system has always been accompanied by a good deal of catastrophe emanating from tragic road accidents, which have been increasing year after another. Moreover, the findings of the study suggests that in order to understand road traffic accident

occurrence and to analyse the contributing factors it is useful to visualise road traffic as a system in which the components are constantly interacting with each other. The system comprise of the following components such as the human as road users i.e. drivers, pedestrians, cyclists as well as the vehicle and the road environment including the operating rules and Traffic Control Devices.

However, the study revealed that Road Safety is a serious problem all over the world; its severity is more pronounced in the developing countries, especially in Africa. Tanzania being one of the African countries is no exception in this regard. Noticeably, the government has made several efforts to tackle the road safety problem by developing and implementing a comprehensive road safety program. However despite this commitment by the government, the frequency of accidents over the past ten years has increased. The cost of road accidents in Tanzania has recently been estimated at TShs. 20 billion annually. Overloading on the major highways is estimated at 20-25% hence being one of the causes of undue damage to the road pavement.

In examining the effects of Road Safety measure in reducing road traffic accidents, the study concludes that, though it is important but road safety measures have produced inadequacy result in reducing the problem of road traffic accidents Tanzania and Dar es Salaam in particular. This is due to the fact that there are multiple causes in the occurrence of road traffic accidents such as human factors, environment, infrastructural, situation and mechanical factors. Therefore, when and how the accidents occur could not be explained by the violation of road safety measures alone.

In identifying road safety measure in Tanzania, it can be concluded that;

There are road safety measures established by the government in order to prevent the occurrence of road traffic accidents. And the public as well as driver are more aware about the presence of those measures. The findings of the study show that these measures are not followed by various most of drivers and other road users. It should be noted that road traffic accidents is strongly linked to available recourses and capacity of the national and local authorities to put road safety strategies in place. Also an economic ability of a country to build enough reliable roads which would reflect the rapid growth of the number of vehicles in the city.

The assumption is shortage of resources and power to follow up on control and enforcement can result in lower motivation of police force. This is because government policy does have an influence on all the factors that cause traffic accidents, be it the quality of the road network, the associated physical environment , traffic engineering , the condition of vehicle or vehicle fleet stock or the behaviours and attitudes of road users. On the other hand, increased social inequality diminish the value of road safety measures, they become less important because the distribution of country resources are not equally divided. Increased corruption also affects the established road safety measures.

In exploring the relationship between increased numbers of vehicles with road traffic accidents, it can be concluded that;

The study found that there is the relationship between the increases in number of vehicle ownership and increase in road traffic accidents. It was noted that the number of cars are increasing while the infrastructures to accommodate those increased

vehicles are limited. It is noted that there are limited road infrastructures have increased the problems of road traffic congestion of which it encourages speed driving in order to cover the lost time from the queue. Also the lack of city master plan caused difficulties in road expansion. Apart from that, the problem also reads to problem in traffic management.

5.3 Knowledge Implication

In the section of knowledge implication, the knowledge gained from the findings and methodology used in the study should be used by other researchers to design studies that further will narrow gaps in the literature. This knowledge should also be used to design future quantitative studies that are more valid and generalizable, or future qualitative studies that are more transparent, coherent, and credible. Specifically, the knowledge generated by the research regarding the causes of road traffic accidents, could be used to suggest future research topics, also to help other researchers to select variables and measures that may be appropriate for a particular topic area of research study. As the road accident being a phenomenon of great concern worldwide, possibly other many study could be generated.

5.4 Policy Implication

Tanzania National Road Safety Policy (2009); acknowledge that road safety is critical in the country. The policy continues to note that road traffic accidents affects social and economic development of individual, families and national economic growth. This is due to large number of death and injuries associated to road traffic accidents. The aim of the policy is to provide the basis for working towards attaining the vision of a safe traffic environment. However, this policy shows that in Tanzania

road traffic accident have not considered as a major public health concern despite the established facts about the magnitude of the road traffic safety crisis in the country. At the same time the policy indicates that the total population of vehicles in the country has been growing year after year. The average growth in the years 1998 – 2007 was 10%. Registered vehicles as of December, 2005 were 231,197 nationwide, while in December, 2006 and December, 2007 registered vehicles stood at 311,712 and 382,152 respectively. Madiro (2013) associates this rapid increase in vehicles with rapid urbanization growth. However, associating increase in road traffic accidents with increase in vehicle as shows in the policy is insufficient to explain the problem because there are so many vehicles in Western Europe and North America, yet literature shows the problem is decreasing. This study therefore, explore other area which could be emphasized in order together with road safety measures the reduction of accident in Dar es salaam and Tanzania in general can be possible.

5.5 Recommendations

Following the presentation and discussions of the research findings as presented in chapter four, here are the recommendations made by the study;

- i. Enforcement and education are the most common and results indicate that enforcement efforts should be accompanied by public information campaigns in order to achieve the greatest effect. Increased and more consistent enforcement will bring positive results
- ii. The use of telephone numbers to report on the driving of others. This approach has the advantage of making callers feel that they are contributing to solving the

problem, and may also help authorities to identify problem spots which can be rectified by infrastructural or other means.

- iii. The media can enhance community awareness and understanding of the causal factors involved in aggressive driving. The media can also support campaigns through responsible, objective reporting and influence societal changes which may lead to a change in poor driving behaviour and attitudes.
- iv. Clearly education and driver training are important in school especially at primary school. It is important to make a formal commitment to promote effective road safety education so that appropriate behaviour is fostered from an early age.
- v. It is also important to develop links between schools and other agencies such as the police. Courteous, non-aggressive driving should be stressed in initial driving tests.
- vi. Continuing driver training is probably necessary since it may only be after the driver has passed his/her test that poor driving starts. A problem with passive education of road users is that many believe they are more skilful and better drivers than everyone else so objective risk estimates are often viewed as somewhat irrelevant.
- vii. Driver's Licensing System in Tanzania has many loopholes that are hindering the growth of this profession. From onset the preparations for the student to become a driver, there is nothing tangible that could lead the prospector to become a good driver. Learner's Licence is issued regardless of whether the person has any knowledge of the dangers he is exposed to or rather a little knowledge of the road and its environment.

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APPENDICES

APPENDIX 1: INTERVIEW GUIDE

Dear respondents, I am Masters Student in the Faculty of Business Management at the Open University. I am currently conducting a research on *“The Effects of Road Safety Measure in Reducing Road Traffic Accidents in Dar es Salaam City”*. I would like you to assist me in answering the question below. The answers provided with you will remain confidential between you and researcher.

Characteristics Profile Respondents

Primary education () Secondary education () Advanced Secondary education ()

University degree () Technical college () Other (specify)_____

1. Please tell me a little about yourself?

What are the main causes of road traffic accidents?

Would you please explain the driving behavior in the city of Dar es Salaam? How is different from other regions?

What are the road safety measures that you know? How it is used

2. Could you please explain under what conditions drivers violates road safety measure in Dar es Salaam city?

3. In your opinion is the road safety measure user friendly to pedestrian and drivers?

What kind of drivers/vehicles / or cars are leading in violation of road safety measures in Dar-es-Salaam city?Why?

In your opinion, is there any relationship between increase numbers of vehicles with road traffic accidents? If any how and why?

4. I would like you to explain various types of road accidents occurs in this area?

5. Would you explain the major causes of road traffic accident in this area?

6. What is unique about the road accidents occurs in this area?

7. To what extent road users understand various road safety measures?

8. What need to be improved in road safety measures in reducing accidents?

9. Any other comments if any?
