FACTORS CAUSING COMMERCIAL MOTORCYCLE ACCIDENTS IN TANZANIA: THE CASE STUDY OF MOROGORO MUNICIPALITY

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for Award of the degree of Master of Business Administration Corporate Management of Mzumbe University

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CERTIFICATION

We the undersigned, certify that, we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled" **Factors causing commercial motorcycle accidents in Tanzania: The case study of Morogoro Municipality**'' in partial/ fulfillment of the requirements for award of the degree of Master of Business Administration Corporate Management (MBA/CM) of Mzumbe University.

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I, **Christopher Ernest Kowi** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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ACKNOWLEDGEMENT

This work has cost me quite a lot of time and resources, both of which I did not readily have. People have showed me kindness, generosity and understanding, to which I owe a lot of thanks and love expressed on this page.

My gratitude goes to my supervisor Dr Stella.M Kinemo, your diligence and dedication to the completion of this work will always be remembered.

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DEDICATION

I dedicate this work to the late my lovely mother Virginia who gave me a lot of advice towards my career path and to my late father, Ernest Kowi who actively encouraged, motivated and supported me during their life span.

Lastly to my lovely wife Damary A. Tuvana who encouraged me to complete my study.

LISTS OF ABBREVIATIONS

CACOMBOQ	-	Causes of Accident among Commercial Motorcyclists in Borno States Questionnaire
DCP	-	Depute Commissioner of Police
FGD	-	Focus Group Discussions
NHTSA	-	National Highway Traffic Safety Administration
MSF	-	Motorcycle Safety Foundation
MRC	-	Motorcycle Riders Course
MOI	-	Muhimbili Orthopaedic Institute
OMEP	-	Ohio Motorcyclists Enrichment Program
OSHA	-	Occupational Safety and Health Administration
RTI	-	Road Traffic Injuries
SPSS	-	Statistical Package for Social Scientists
SD	-	Standard Deviation
SUMATRA	-	The Surface and Marine Transport Regulatory Authority
TRA	-	Tanzania Revenue Authority
USA	-	United States of America

ABSTRACT

This study paper focused on factors causing commercial motorcycle accidents in Tanzania; the case study of Morogoro Municipality. The purpose was to create awareness on how occurrence of accidents among commercial motorcyclists can be brought to a minimum level or completely eliminated through the use of information.

The total numbers of one hundred fifty were considered for study from various locations within Morogoro Municipality. The locations including Kihonda, Mafiga, Morogoro urban bus stand, Msamvu bus terminal, Postal area, Regional hospital, Mazimbu campus and Misufini were considered for data collections. The same numbers of respondents were found valid for analysis. Data were analysed through Statistical Package for Social Scientists.

The findings of this study showed that demographic information has significant influence on the causes of road accidents among commercial motorcycle riders in Morogoro Municipality. Among factors that significantly contribute to increasing rate of commercial motorcycle accidents are: over speeding, wrong overtaking, bad roads, alcohol drinking and driving, bad road, lack of training and non-observance of traffic law. It was discovered that commercial motorcycle riders do not comply with the Road Traffic Act, 1973 as amended 2002.

It is recommended that motorcyclists be issued road license after attending formal training. There should be a creation of road safety awareness using media as a means of communications at national level. The infrastructures should continuously be improved and there should be strict penalties against anybody contravening road traffic rules.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE
INTRODUCTION TO THE STUDY

1.1 Introduction

In this chapter introduces the study. The background of the study is provided in Section 1.2. The statement of the problem is stated in Section 1.3. The objective of the study is provided in Section 1.4. The research questions are in section 1.5. The significance of the study is provided in Section 1.6. The limitations of the study are stated in Section 1.7. Section 1.8 contains the scope of the study and section 1.9 contains organization of the dissertation.

1.2 Background to the Study

In recent years there has been an increase of road accidents*. Worldwide, it is estimated that, 1.2 million people are killed in road crashes each year and as many as 50 million are injured (Odero et al, 2003). With increasing modernization in many developing countries, road traffic deaths are increasing and traffic deaths are projected to become the third most important health problem by 2020 (Afukar,F.K, 2003). The increasing use of motorcycles particularly for commercial service is a source of concern in this regard because motorcycles cause many more fatal road crashes than other vehicles worldwide. In Tanzania a total of 23,842 and 14,360 accidents, fatality and injury occurred between 2013 and 2014 respectively. The deaths between the mentioned periods were 4,002 and 3,760 respectively. A total of 20,689 and 14,530 of injuries occurred between 2013 and 2014 respectively (Traffic Police Headquarters 2015). As motorcycles are relatively unsafe vehicles, the riders must be considered as unprotected vehicle users and their injuries are usually severe (Chalya, 2012**).**

Motorcycle accidents form a fatal category of motor traffic accidents in especially in the developing countries. Motorcycle riders have a 34 times risk of death than the drivers of other types of vehicles and 8 times more likely to be injured (Akinpelu, 2007). In sub Saharan Africa, there has been an introduction of commercial motorcyclists who carry

passengers for hire. It has become one of the major and most common means of informal transport. Its popularity and widespread acceptance has rapidly risen in recent years. Commercial motorcycling has also served as a means of gainful employment to quite a number of people due to the increase in the rate of unemployment (Peden, 2004). The emergence of commercial motorcycles is due to inadequacies of mass transportation systems in the country. Bad roads with the associated traffic congestion, as well as the ability of these motorcyclists to pass through traffic jams have encouraged the patronage of this mode of transportation. The other means of transportation are unable to access these roads (Jacobs et al, 2000).

Unfortunately, the rise has been accompanied by increased levels of high-risk behaviour and accidents; as a result they have come under heavy scrutiny culminating in legislations restricting. In some instances prohibiting their operations in other areas like city centers. The motorcyclist spends more than 10 hours daily on the road with direct exposure to various environmental hazards including road traffic accidents and associated crash injuries of various levels of severity. The rate of road traffic accidents associated with commercial motorcycling has also been on the increase with a rise in the number of injuries presented at hospitals (Andrews, 2009).

The injuries come with associated huge socio-economic consequences to the injured, their families and the society at large. Many reasons have been suggested for the unacceptably high rate of road traffic accidents. The increase of Motorcycle crash has been reported in a number of African countries. In Nigeria for instance motorcycle crashes were responsible for 54% of all injuries seen in one teaching Hospital. While in Uganda motorcycle crashes were responsible for 25% of all road traffic injuries seen at Mulago Teaching Hospital (Bener, 2005).

In recent years there has been an increase in motorcycling as means of transport in Tanzania in general and Morogoro in particular. It is believed that motorcycle is also a source of employment and income to young people. This increase in motorcycling has been accompanied by an increase of motorcycle accidents. As experienced the leeway in

commercialization of motorcycles came to relief the masses of the serious transportation bottlenecks faced both in the urban and the rural populace. The later mainly depended on bicycles, tractors and trucks whereas greater numbers have been doing it on foot, like were the case in the prehistoric times.

While the commercialization of motorcycles epoch is gaining momentum, yet the road carnage related to the new system is day in day out on the increase. with some of the reasons to the effect are within manageable stance. Some of these are including shortage of reliable and smooth roads infrastructure in urban and rural areas irrespective of their materials worthiness (Museru et al, 2008). Recklessness has been accounted for, among a big number of motorcyclists as the main causes of the fatal motorbike related accidents, coupled with none-wearing of helmets, riding under the influence of alcohol and none-adherence to road traffic regulations. These include carrying more than one passenger and who do not have protective clothes or helmets. In worst scenarios, children are also carried in this fashion nicknamed “mishikaki", oblivious of the dangers associated with such decision. Many people, youths in particular have found themselves losing limbs and many more ending up with permanent disabilities (Museru et al, 2002). Although motorcycle accidents do not claim many lives at ago, they are so regular that eventually the number of youths who lose lives and limbs through is alarming. Motorbikes are now being referred to as “killing machines”. The situation is critical. Some research findings have shown that given the proportionate number of vehicles on Tanzanian and the USA roads, chances of dying by road accidents are about 20 times more in Tanzania compared to meeting a similar fate in USA (Muhanika, 2014). Therefore, this study aims at examining the factors causing commercial motorcycle accidents in Tanzania.

1.3 Statement of the Problem

Motor cycle accidents have become the most serious problem threatening the entire Tanzanian population. It is against this background that this study attempted to investigate the causes of accidents among commercial motorcyclists in Morogoro

Municipality. Although Morogoro is becoming a highly urbanized, the infrastructures have not kept pace. Morogoro Municipality has a large number of registered motor vehicles, and motorcycles. The municipal has no sufficient transport system and the majority of the roads are of poor surface conditions caused partly by lack of maintenance.

During the last five years, motorcycle registrations have more than doubled and, unfortunately, the number of motorcycle accidents and injuries has increased by approximately the same factor. The most recent statistics show that the number of fatalities attributed to motorcycle traffic accidents is approaching five thousand per year (Tanzania Police Force). At present time, motorcycle accidents contribute nearly 10% of the traffic accident fatalities. Motorcycles are only one or two percent of the vehicles in traffic. In this way, the motorcycle appears to be the most dangerous form of motor vehicle transport. When the authorities allowed in 2009 to be used for commercial purposes: herewith nicknamed 'bodaboda', nobody believed the good intentions would turn to be almost a national disaster. This is because road carnage reports (2013) account for almost 1,000 deaths that are related to motorcycles alone.

Motorcyclists form a significant proportion of people who are affected by road traffic accidents. For example, 181 lives were claimed in Tanzania due to motorcycle accidents during the first quarter of 2010 (Nkwame, 2010). Furthermore, according to Tanzania Traffic police at least 3,642 people were killed and another 18,813 were injured between June and November 2013 following 21,691 accidents in Tanzania blamed on massive increase of vehicle traffic in recent years. From January to June 2012 Tanzania mainland recorded 11,163 road accidents that killed 1,808 people and left 9,155 others injured (Mpinga, 2012). According to the Depute Commissioner of Police (DCP), it is estimated that the total number of road casualties on Tanzania roads is about 20,000 to 25,000 accidents per year. A big increase of motorcycle taxis (bodaboda) has largely been attributed to the increase of death.

Despite the many interventions, the government has tried to put in place to avert the road accident menace involving all road service providers. News about accidents and by extension motorcycle related accidents dominates the local media houses. The most recent attempt to avert the situation is the introduction of Alcohol blow, mobile courts and night travels ban but still motorcycle accidents are on the toll in our roads (Ministry of Transport, 2014). The traffic reports show that motorcycle accidents were the leading cause of death since motorcyclists were allowed to operate commercially in the country from 2009. In 2013 there were 8,241 motorcycle accidents compared to the figure 5,410 that occurred in 2014 (Traffic Police Headquarter 2015). However, these figures show that motorcyclists are more vulnerable to road accidents than drivers of other means of transport. Therefore, this study aims at examining the causes of factors causing commercial motorcycle accidents in Tanzania.

1.4 Research Objectives

1.4.1 General Objective of the study

The main research objective was to examine the factors causing commercial motorcycle accidents in Tanzania whereby Morogoro Municipality was used as an area of study.

1.4.2 Specific objectives of the study

(i) To find out demographic factors of commercial motorcyclists.

(ii) To find out whether commercial motorcyclists had formal training prior to riding.

(iii) To identify whether commercial motorcyclists are aware of the cycling Regulations

(iv) To find why motorcyclists do not put on helmets

(v) To find out the impact of infrastructures towards occurrence of commercial motorcyclist's accidents.

(vi) To find out challenges faced by Police Traffic in preventing accidents.

(vii) To find out the impact of infrastructures towards occurrence of commercial motorcyclist's accidents.

1.5 Research Questions

(i) How demographic factors contribute to the occurrence of commercial motorcyclists accidents?

(ii) Do the commercial motorcyclists receive formal training before riding?

(iii) Do the commercial motorcyclists are aware of the prevailing cycling regulations in Tanzania?

(iv) What are the possible measures that can be adopted by Traffic Police to reduce road accident associated with commercial motorcycle?

(v) Are the commercial motorcyclists are aware on the importance of wearing helmets?

(vi) Does the road infrastructure in Tanzania contribute to occurrence of commercial motorcycle accidents?

1.6. Significance of the Study

The findings of this study expect to be useful in the following aspects:

This study is set out to help in understanding the underlying factors influencing motorcycle accidents. The possible solutions in the endeavor to curb the increasing number of fatalities due to motorcycle accidents is also considered. The information will also be useful in developing rules for management of motorcycle accidents. Also the information provided by this study may be indeed useful in the public awareness campaigns and road safety use programs. The study is equally expected to help in recognizing the role and importance of associated factors in motorcycle accidents.

The findings of this study contribute to the attainment of master's degree in business administration. Likewise the study customized the existing theories in other parts of the world to Tanzanian context and hence become a bench mark of reference. This study also provides reliable information to stake holders and shareholders in commercial motorcycle. This study serve as a guide for future research in the same area, and to systematically bring to light pertinent issues related to the study at hand.

Also this study provides knowledge to academic community and existing literature on the cause of accident among commercial motorcycle in Tanzania. The study further recommended areas of research not covered in this study. The study provides useful information to researchers and other stakeholders in the sector, adding to the knowledge of issues which might shape the way the industry is operated and regulated.

The findings of the study is useful in minimizing if not alleviating motorcycle accidents and minimizing their consequences in terms of mortality and disability. Therefore the findings from this study is beneficial to the; motorists, passengers, government, and the general public. The research findings had identified the gaps and possible ways of filling such gaps to curb motorcycle accidents.

1.7. Limitation of the study

The main limitations of this study were generally; the scarcity of resources specifically finance and inadequacy of allocated time for the research work. It was also difficulty to obtain information from the selected case study. The study were constrained by limited time and meeting schedules of the respondents since their meeting was during the business hours. Also, the study was constrained by several trips to and from headquarters of the respective company. Lack of cooperation to some members of staff due to one reason or another for unwilling to provide the necessary information to the study. This also constituted the whole exercise to come up with inadequate data / information. The researcher spent more time for those who responded positively. Moreover, only necessary cost were spent to meet the anticipated budge. In future studies financial resources and cooperations should be overephasized before commencement of the study.

1.8. Scope of the study

The study restricted itself at examining the factors causing commercial motorcycle accidents in Tanzania specifically at Morogoro municipality. It is where there large number of registered commercial motorcycles operates. Time period covered for study

were five months from February 2015 to June 2015 for data collection and analysis of information.

1.9 Organization of the dissertation

This dissertation is divided into five chapters. Chapter one is about introduction of the study, background of the study, Statement of the problem, research objectives and research questions, significance of the study, limitation and the scope of the study. Chapter two is about literature review on the contributing factors leading to motorcycle accidents, theoretical framework, empirical literature review, research gap and conceptual framework. Chapter three is about research methodology. Chapter four is about results and discussion and chapter five is about conclusion and recommendations.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter provides relevant literature review and main concepts of this research work. It covers the followings: definition of key constructs theories and concepts of related studies, empirical studies and at the end of the chapter it provides a conceptual framework to govern the research synthesis.

2.2 Contributing factors leading to motorcycle accidents

A number of risk factors contribute to traffic crashes and the resulting human casualties. These factors are often classified into three major categories, human, vehicle, and highway infrastructure. Human factors, including road user behavior and incapacitation, are the most common factors, accounting for more than 85% of all traffic crashes (Odero et al, 2003). Among them, the two key known contributing factors are speeding and drinking and driving.

Speeding is a key contributing factor in traffic collisions and injuries in Africa, regardless of the variation of policy investigation and reporting in different countries (Afukaar, 2003; Butchart et al, 2000). Speeding is a contributing factor in 75% of the traffic fatal crashes in South Africa (Satchwell, 2002). Speeding is a contributing factor in more than 25% of all traffic crashes in Dar-es-Salam in Tanzania between 1999 and 2001 (Barengo et al, 2006). Higher speed reduces the response time of the drivers of the motor vehicles and increases the severity of the injury, due to the larger amount of energy to be dissipated at contact/impact. Arguably, every traffic crash is speed related, and speed management is apparently one of the top issues for safety improvement in African countries. Drinking driving is another key factor contributing to traffic crashes and injuries (Pluddemann et al, 2004).

Alcohol influence has been found in 50% of the police reported accident in a study in Nigeria between 1996 and 2000 (Mondong et al, 2006). However, even this number is likely to underreport alcohol as a contributing factor in traffic crashes and injuries in many African countries. Lack of detection and enforcement has been cited in the literature as the reason for concern. In Tanzania, for example, the lack of identification of drinking and driving as a contributing factor has been specifically attributed to the lack of technology, logistics and culture, as well as reluctant in enforcing drinking and driving laws (Museru et al, 2002). Lack of devices on the road side, the police has to take the drivers to medical centers, where doctors may or may not be available for blood concentration test in the name of law enforcement (Bekibele et al, 2007).

Human incapacitation has been reported in the literature as contributing factors in road traffic crashes. This factor is rendered somewhat heightened status in transportation in present Africa, where private vehicle ownership is still low and most people take public transportation, i.e., buses and mini-buses, operated primarily by private companies. Two key issues stand out in this concern, the driver visual acuteness and driver fatigue. A study of drivers in public institutions found that older drivers with lower level of eye sight tend to have higher likelihood to be involved in traffic collisions. Lack of examination of eye sight, especially for older drivers who drive buses or trucks, is therefore of policy relevance for decision makers, given the significant role that commercial transportation plays in these nations and economies (Adeoti, 2007).

Driver fatigue, especially truck and bus driver fatigue is considered a major issue, threatening transportation safety in the world, including Africa (Adams-Guppy and Guppy, 2003; Davis et al, 2003). This issue is exacerbated by the overcrowding of passengers and the lack of maintenance of the buses and trucks. In Kenya, for example, most crashes in rural areas involve public transportation vehicles, including buses and matatus, a smaller vehicle used for personal transportation often owned and operated by private companies in Africa. The long distance driving and the lack of effective

management of fatigues contribute to the crashes and the resulting injuries and fatalities (Odero et al, 2003). Fatigue affects road users who lack protection specifically. A Nigerian study shows that rider fatigue contributes to 13% of motorcycle crashes in Nigeria (Oginni et al, 2009).

Another major category of contributing factors relates to vehicles. Vehicle roadworthiness is a concern in Africa, although it accounts for a smaller percentage of crashes, between 5% and 6% of the total traffic crashes as the sole contributing factor (Odero et al, 2003). However, combined with other factors, human and roads, vehicle are involved in more than 10% of all road traffic crashes (van Schoor et al, 2001). Given the present economic condition and the lack of car manufacturers in this region, many African countries import older, second hand vehicles. Lack of regulation and inspections at the boarder entry point, the imported vehicle may have varying road worthiness in the first place. This is furthered by the lack of maintenance, in terms of neglect and replacement using low quality substitute, especially for safety components, such as tires and brakes. This issue may not be improved without economic recovery, coupled with policy initiatives to control imports and regulate fleets on public roads.

Highway infrastructure is another category of factors that contribute to traffic crashes in African countries. Although bad roads account for less than 5 percent of the causes that contribute to traffic crashes, the consequence in human and economic terms is equally devastating (Baguley and Jacobs, 1999). Specific factors include potholes and sharp/steep bends (Odero et al, 2003). A number of reasons have been advanced as explanations for the current road conditions in the African context. Impacted by war, political instability and economic stagnation, roads in many African countries are often badly maintained. More often than not, safety was not been considered in the design of new highways nor safety was not being considered as priorities in highway maintenance. Not being cited as the key contributing factors in the majorities of traffic crashes, unsafe road in combination with human error and vehicle malfunction does in fact increase the

frequency and severity of traffic crashes, injuries and fatalities (Baguley and Jacobs, 1999).

2.3 Cycling regulation

Commercial motorcycle business in Tanzania is regulated by the Road Traffic Act, 1973 Chapter 168 revised 2002, which provide the control and regulation of road traffic. The Act requires all authorized vehicles to be used under a license issued by the provision of the Act. Motor vehicle has been defined as a mechanically propelled vehicle intended or adapted for use on roads while motorcycle means a motorcycle with less than four wheels, the unlade weight of which does not exceed four hundred kilograms. The Act therefore recognizes motorcycle as a vehicle. Section 19 of the Act is about driving without a valid driving license is prohibited. A person is prohibited to use motor vehicle without licenses. The Act requires the renewal of the license after two years from the date of issue. The Act under section 39A and 39B is about permissible weight and use of signals. Section 42 is about reckless or dangerous driving. Section 44 of the Act is about driving under the influence of drinks or drugs. Part VI of the Act is about enforcement. Section 77 of the Act has given power to police officer to stop, inspect and demand production of driving license. It is an offence to drive a motorcycle without license. The Act prohibits commercial motorcyclists to operate the business without license.

2.4 Challenges of Police Traffic towards prevention of motorcycle accidents

2.4.1 Lack of protection and adequate clothing for riders

Safety is the biggest problem of commercial motorcycle transport in Tanzania. Due to a lack of protection, motorcyclists are much more vulnerable than users of other transport modes like cars or buses. Furthermore, motorcycles can reach high speeds of more than 90km/hr; most riders do not wear helmets or provide helmets for their passengers. Moreover, most motorcyclists wear flip-flops instead of properly fitted boots. In combination with reckless driving and over speeding they are more prone to crash injuries than car occupants.

2.4.2 Driving without a license and over loading

Majority of the commercial motorcyclists operating their businesses within Morogoro Municipality do not possess a driving license. The commercial motorcyclists are also not aware on the existence of the traffic rules and road signs. The impact of operating their business without driving license leads to loss of government revenue and violation of traffic rules hence overestimate their driving abilities. Another challenge for preventing commercial motorcycle accidents includes excessive carriage of passengers and goods. There is a tendency among commercial motorcyclists to carry excessive passengers on one motorcycle popularly known as mishikaki in Swahili term. In rural areas all kinds of goods are transported, including heavy and hazardous goods like petrol, bags of charcoal which further compromises safety.

2.4.3 Lack of strict enforcement of traffic law

Enforcement is seen as a good measure in improving traffic order and to enhance the safety of motorcyclists Hsu, Ahmad and Nguyen (2003). In Taiwan, motorcyclists who are caught not wearing crash helmets are fined the equivalent of United States dollar 15 (Chiu, Kuo, Hung and Chen, (2000). Accidental injuries dropped drastically as a major cause of death. Another reason for this positive result observed in Taipei city is a six month helmet use campaign that educated Taipei citizens on the benefits of helmet use and the perils of riding a motorcycle without using helmets.

2.5 Role of SUMATRA in preventing motorcycle accidents

The Surface and Marine Transport Regulatory Authority (SUMATRA) is a multi- sector regulatory agency established by an Act of Parliament No. 9 of 2001. The Act came into force on 20th August 2004. The Authority is under the Ministry of Transport. SUMATRA is tasked, among others, with the functions of issuing, renewing, cancelling and amending road service license. The procedures for applying road service license involve the filling of application forms attached with commercial motorcycle registration card. When these conditions are fulfilled then license is issued. The license

issued carries the conditions of license and license stickers. The license stickers must be displayed on the motorcycle and the conditions retained by the motorcycle owner. Through issuance of road license, SUMATRA can minimize commercial motorcycle accidents by imposing several conditions which motorcycle riders should abide including motorcyclists training. Working together with Police, SUMATRA can minimize commercial motorcycle accidents through institution of training before issuance of road license. However SUMATRA has delegated the role to Local Government including Morogoro Municipality.

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2.6 Attitudes

The term attitude is frequently used in describing people and explaining their behaviour. More precisely according to Luthans (2005), an attitude can be defined as a persistent tendency to feel and behave in a particular way toward some object. Attitudes are evaluative statements either favourable or unfavourable concerning objects, people or events (Robbins, 2005). Luthans (2005) provide three components of attitude as emotional, informational and behavioural. The emotional component involves the persons' feelings or effect- positive, neutral, or negative about an object. The informational component consists of beliefs and information an individual has about the object. It makes no difference whether or not this information is empirically real or correct. He proceeds by saying that the third component is behavioural, which consist of

persons' tendencies to behave in a particular way toward an object. Of the three components of attitude, only the behavioural component can be directly observed. It is assumed that if you want to know someone's beliefs, feelings, and behavioural tendencies toward an object, all you need to do is measure his or her attitude. In this study, therefore, the third component of attitude which is behavioural component was studied specifically on the individual attitude towards motorcyclists.

2.7 Demographic factors of commercial motorcyclists

2.7.1 Motorcyclist accident involvement by age and gender

The associations between drivers' age, gender, and driving behaviour, and involvement in accidents are important factors in developing traffic safety strategies. Motorcycle riders have an increased likelihood of being involved in an accident compared with other motor vehicle drivers. (Mannering and Grodsky, 1995). However, most studies exploring the relationships between risk factors and involvement in accidents have focused on the drivers of motor vehicles with four or more wheels, and relatively few studies have focused on motorcyclists, particularly on the risks of injuries and property damage. (Lin, Chang, Pai and Keyl, 2003). To gain a better understanding of motorcycle riding behaviours, it is valuable to extend focus to the risk factors that contribute to motorcyclist accidents.

Young and male motorcycle riders have a stronger propensity for risk behaviours, and these behaviours have been shown to be associated with increased risks of accidents (Rutter and Quine, 1996).

Young riders and male riders also perceived themselves to be at risk of accidents (Mannering and Grodsky, 1995). Rutter and Quine (1996) identified particular patterns of youth behaviours, such as a willingness to break the law and to violate the rules of safe riding, which had a much greater role in accident involvement than inexperience.

Male motorcyclists were found to have a higher risk of accident involvement as compared to female (Chesham, Rutter, and Quine, (1993). In general, young male

drivers as a group behave more riskily than female and older drivers and are also worse at hazard perception than older drivers (McKenna, Waylen, and Burke, (1998).

It is well documented that adolescents are more likely than adults to engage in risky behaviours. For example, adolescents are more likely than adults to drive recklessly, to drive while intoxicated, to use illicit substances, to have unprotected sex, and to engage in both minor and more serious antisocial behaviours (Arnet, 1992). Most evidence suggests that risk-taking is the most important major factor in the high crash rates among teens (Finn and Bragg, 1986; Jonah, 1986); Williams, 2001). The tendency for young drivers to engage in high-risk driving activities has been well documented (Cooper, 1987; Evans and Wasielewski, 1983; Jonah, 1986, 1990). For example, risk-taking behaviours in young drivers have even been identified as a major factor in young drivers' basic motivation in not using seatbelts, which is one of the reasons that their fatal crash rates are higher than those of older age groups. (Williams and Shabanova, 2002; Jonah, 1986).

2.7.2 **Personal income**

Some adolescent health risk behaviours appear to be disproportionately, lower- income adolescents, and those living in poverty, but these demographic factors do not predict youth health risk behaviours well. Robert, Trisha, Marcia, Linda, Renee and Michael, (2000). Helmet use varies from slightly over zero in some low – income countries to almost 100% in places where laws on helmet use are effectively enforced. In several low-income countries, helmet use has been found to be lower at night Ichikawa, Chadbunchachai, and Marui (2003).

2.7.3 Personal and social factors of motorcyclists and risk taking behaviour

Lin et al. (2003) showed that young motorcyclists with crash experience had higher risk-taking levels during the study period than those without previous crash experience. It seems that motorcyclists who perceive a higher risk after experiencing a crash do not adopt precautionary behaviours or curb their risk-taking behaviours. This finding is

consistent with the results for all motor vehicle groups who had been involved in accidents, Begg, Langley, and Williams, (1999)

According to Haworth, Symmons, and Kowadlo, (2000) many of the riders who were involved in crashes involving deficiencies in hazard perception or response were inexperienced. Inexperience is much more common among motorcyclists than car drivers. Inexperienced motorcyclists include riders who have little riding experience, those who ride infrequently and those who have not ridden frequently for a number of years. Thus they are many inexperienced motorcyclists who are not necessarily young or new riders.

2.7.4 Exposure towards action movies

Job (1990) questions the effectiveness of media coverage of severe accidents in deterring risk taking. He suggests that this type of media coverage may instil overconfidence in young drivers, who believe they must be good drivers because they have not been involved in accident. He also indicated that this may lead young motorcyclists to take greater risks, which can cause injuries and possible death.

2.7.5 Parental guidance and monitoring

Parental monitoring has received particular attention in relation to adolescent substance use, with a substantial body of literature consistently demonstrating that higher parental monitoring is associated with reduced risk of smoking, and alcohol use, as well as other deviant and risk behaviours among adolescents (Barnes and Farrell, 1992; Chilcoat and Antony, 1996). In studies that have examined multiple dimensions of parenting, monitoring often has the strongest effect (Barnes and Farrell, 1992).

2.7.6 Peer influence

For teenagers, the motor vehicle is more than a mode of transportation. Driving provides not only a degree of freedom from parental surveillance, but also a sense of achievement and social status (a driver's license) that were previously unavailable to them as children

and adolescent. Adults, however, seem to be less aware of this, a factor that is pertinent especially when it comes to concerns about peer influences on teen driving. Researchers recognise that adolescent's driving behaviour depends on who is in the car with them. Teenagers drive faster and take more risks when carrying peers than when carrying adults as passengers, especially if their peers are young men (Allen and Brown, 2008).

2.8 Theoretical Framework

This study is guided by systems theory. A system is a group of elements organized such that each one is in some way interdependent (either directly or indirectly) with every other element. In addition, it is required that the systems have a function, goal or purpose (Johnston et al, 2000), the systems theory also known as the systems approach (Rothe, 2002) is the most predominant framework employed in safety research in recent decades (Salmon et al., 2010). Its advent dates far back to 1940s when Chapanis (1999) in a groundbreaking study in the 1940s on aviation safety and plane crashes found that „pilot error" was essentially „designer error". Systems theory adopts an analogy of a living organism which is made up of different organs that perform different but complimentary role for the general well-being of the organism. Accidents arise from interactions among human, machines and the environment but not from simply chains of events or linear causality, but more complex types of causal connections. Under normal circumstances chances of an accidents is low. Rather than looking at the environment as being full of hazards and people prone to errors, systems theory assumes that there is a steady state between individuals and the environment. For example the theory explains how combination of illegal speed and alcohol use is significantly related to occurrence of motorcycle accidents and how such factors responsible for the accidents can be changed to serve better the community

The strengths of this theory are in its holistic approach to the road traffic problem. It is both a method and an intervention blue print to accident management. It is also comprehensive because its tenets cover all categories of road users such as drivers,

pedestrians, cyclists, and passengers (Johansson, 2009). As other theories which preceded it, systems theory does not account fully for all aspects of the traffic carnage. For instance, traffic law enforcement has not been given attention yet it is known to be another key factor in accident research. It is also considered by many safety researchers to be too generic in scope and thus lacks specificity when it comes to particular accident situations. These weaknesses notwithstanding, it stands tall among its counterparts for its universal appeal and interdisciplinary orientation or application. Motorcycle accidents are seen as resulting from the failures of the whole system rather than a failure of the driver or any single factor. As such this theory provides a holistic view on the causes of motorcycle accidents.

2.9 Empirical studies

Motorcycle crash studies provide ample evidence that motorcyclists are not easily seen by drivers of other vehicles, particularly when traffic is heavy and the visual field is complex. A common claim of motor vehicle drivers involved in crashes is that they did not see the motorcycles and their riders at all, or did not see them in time to avoid the crash. In roughly half of the cases in which motor vehicle drivers failed to detect a motorcycle in time to avoid a crash, other obstacles were present, either within the vehicle, as part of the landscape, or in passing traffic, that interfered with the driver's line of sight (Hurt et al., 1981; Bednar et al. 2000). The ability of other road users to see and notice the motorcycle is termed as conspicuity. Because motorcycles are less conspicuous than passenger car or truck, they are more difficult to determine, and this largely contributes to the high accident rate of commercial motorcycles. (Thomson 1980; Wulf et al, 1989.

Mburza, (2009) in the study causes of accidents among commercial motorcyclists (Okada) in Borno State: Implications for Counseling. The population of the study consisted of all the commercial motorcyclists in the State. However, a sample of 2000 commercial motorcyclists was purposively selected for the study. A twenty - item questionnaire titled "Causes of Accident among Commercial Motorcyclists in Borno State Questionnaire (CACOMBOQ)" designed by the researchers, was used. One

research question and two hypotheses were answered and tested in the study, respectively. Frequency counts, percentages and rank ordering and rank difference correlation coefficient were the statistics employed to answer the research question and test the hypotheses respectively. The findings from the study revealed that influence of drugs, over - speeding, unlicensed and untrained motorcyclists, impatience by motorcyclists, over loading, wrong over - taking, bad roads, non-observance of traffic laws, non-use of rear mirror and receiving calls while riding were the major causes of accidents among the commercial motorcyclists. Also there were significant relationships among age, educational background and causes of accidents. Counseling implications based on the findings include posing threat to lives of the young and the old. It was recommended that organizing enlightenment campaigns for commercial motorcyclists, obtaining motorcycle driving licenses by motorcyclists and imposing fines on Okada riders who flout any traffic laws among others.

Ogunmodede, *et al* (2012) in the study Factors Influencing High Rate of Commercial Motorcycle Accidents in Nigeria, this research paper focused on factors influencing high rate of commercial motorcycle accidents in Oyo State, Nigeria. The purpose was to create awareness on how occurrence of accidents among commercial motorcyclist can be brought to a minimal level through the use of information. The total number of four hundred and fifty commercial motorcycle riders was considered for the study; the same numbers were returned and found valid for analysis. The findings from this research work showed that demographic information has significant influence on the causes of road accidents among commercial motorcycle riders in Nigeria. Among factors which significantly contribute to increasing rate of commercial motorcycle accidents are over speeding, wrong overtaking, bad roads, sudden mechanical defects, alcoholic intake etc. It was discovered that commercial motorcycle riders do not comply with Road Safety Highway Codes. The paper therefore provides valuable information on causes of accidents especially among commercial motorcyclist in Nigeria and how those causal factors can be managed.

Motorcycle accidents can also be caused by the aggressive driving and risk taking behaviour of motorcyclists. Motorcyclist alcohol and other impairments are a prominent factor in serious motorcycle crashes. Early research in the United States has shown that more than half of fatal motorcycle accidents involved alcohol (Hurt et al., 1981)

The risk taking behaviour of the motorcyclists has been identified as a critical contribution to the occurrence of many health problems such as motor vehicle crashes (Jelalian et al., 2000). Horswill and Helman (2001) analysed the behaviour of the motorcyclists in a laboratory environment. They found that motorcyclists choose faster speeds than the car drivers, overtook more, and pulled into smaller gaps in traffic, though they did not travel any closer to the vehicle in front. The speed and following distance findings were reproduced by two further studies where cars and motorcycles were unobtrusively measured from the roadside.

The risk taking behaviour of motorcyclists is also influenced by demographic factors. For example, Chesham et al.,(1993) found that young male motorcyclists are at a higher risk of accidents involvement than other motorcyclists. In general, young male drivers as a group behave more riskily than female and older drivers and are also worse at hazard perception than older drivers (McKenna, et al., 1998). Both these factors are likely to influence their accident liability and, indeed, young male drivers have a higher accident liability than either female or older drivers (Maycork, et al., 1991; McKenna et al., 1998).Moreover, Lin et al., (2003) showed that young motorcyclists with crash experience had higher risk taking levels during the study period than those without previous crash experience. It seems that motorcyclists who perceive a higher risk after experiencing a crash do not adopt precautionary behaviour or do not reduce their risk taking levels. This finding is consistent with the results for all motor vehicle crashes. (Begg et al.,1999; Slap et al. 1991). Moreover, given the extent to which motorcyclists took more risks, the increased risk taking behaviour of motorcyclists was only likely to account for a small proportion of the difference in accidents risk between motorcyclists and car drivers. For example, Horswill and Helman (2001) believed that the difference

in speeds would make motorcyclists only 4% more likely to be killed given a crash if the motorcyclists had the same physical protection as a car driver.

Alcohol and other substances have found to be major risk factors in all types of motor vehicle crashes. According to the Traffic Safety Facts (NHTSA; 1998), these factors appear to weigh more heavily in motorcycle crashes than in crashes of other vehicle types in the United States. In 1998, intoxication rates for vehicle operators involved in fatal crashes were 36 percent for motorcycles, 29 per cent for light trucks, 25 per cent for passenger cars, and 3.0 percent for large trucks. Forty five percent of motorcycle operators killed in single vehicle crashes, and 62 percent killed in weekend night, single vehicle crashes, were intoxicated. Helmet use rates in the United States for intoxicated motorcyclists are lower than for those who are sober impaired motorcyclists involved in crashes are more likely to be speeding than those not drinking.

According to Elliot et al. (2003), there are some inherent characteristics of motorcycles that make the riders more prone to accident and injuries. The most essential characteristics of motorcycles are being a balance machine. Hence, the incorrect use of brake is likely to cause the motorcycle to lose balance. With two wheeled motor vehicles a mistake by the rider that leads to either wheel being over braked will cause the machine to skid, become unstable and capsize. The incidence of skidding in personal injury accidents is substantially greater for motorcycles than for other vehicles. It has been shown that many motorcyclists brake incorrectly, and this is thought to be a contributory factor in many motorcycle accidents.

Etukumana (2010) in the study possible causes of motorcycle (okada) accidents in Karu, Nigeria, the objective of the study was to identify possible causes of motorcycle accidents among motorcyclists, and suggest some preventive measures. Materials and methods was chosen for convenience of study. Karu is a nearby town to the federal capital Abuja, Nigeria. A structured questionnaire and interview were administered to 50 Okada riders. Okada riders were selected randomly at differently locations in Karu. Responses were analyzed. Result: Reckless driving accounted for 78% of the accidents while alcohol and drug intoxication 66% and 46%, respectively. Structural factors were

faults in the motorcycles which were responsible for 44%. The poor state of the roads and absence of road traffic signs in 12% and 22% cases, respectively. Other attributing factor was unfavorable emotional state of the rider (22%). Reckless driving was identified as a major cause of road traffic accidents among Okada riders in Karu, Nigeria.

Mortimer (1984, 1988) conducted two evaluations of the Motorcycle Riders Course MRC. Both studies compared riders who had completed the course voluntarily. The trained groups appeared to be generally lower risk takers- they were more likely to wear seatbelts when travelling in cars and more likely to wear protective clothing when riding than the control group. Therefore, it appears that the control group may not have been appropriate to establish the effect of training on the lower risk takers who comprised the trained group. Given the above, it is not surprising that Mortimer's studies found that the trained riders rode less mileage, rode less of their mileage on highways and rode less powerful motorcycles. The MRC riders and controls did not differ in the number of accidents or traffic violations although the second study suggested that the accidents of trained riders were less severe (this may be a consequence of their different riding patterns).

The literature has reported mixed results from increases in police enforcement that occur over a large geographic area for an extensive period of time. A study conducted on the Random Road Watch police intervention program in Queensland, Australia found that this program decreased the annual number of car accidents by 12 per cent (Newstead et. Al., 2001). These papers provide an estimate of how focused increases in police deterrence can affect accident rates. The programs are applied specifically at problematic road segments where a significant portion of accidents occur. A causal interpretation of these results is dependent upon the assumption that speeding trends between the treatments and control roads are identical absent police intervention. An alternative method is to estimate how legislation related to police presence affects accident outcomes. Thus, an entire country (or state) receives a treatment effect and behaviour can be compared to that observed prior to the legislation. In a study looking at

the impact of deterrence policies on reckless driving in Portugal, the authors conclude that the government could be more effective in reducing traffic accidents by increasing the 'certainty of punishment' via increased police enforcement (Tavares et, al., 2008). They reach this conclusion after regressing the rate of accidents in Portugal between 1995- 2004 on indicators regarding new legislation of increased traffic fines, on-the-spot payment, and lower legal blood-alcohol limits. In essence, changes in allowed blood alcohol concentration levels are used as a proxy for enforcement since their data does not allow a direct estimate of police enforcement.

Mwakapasa (2011) in the study attitude towards and practice of helmet use among commercial motorcyclists in Dar es Salaam region, Tanzania, the purpose of this study was to explore the commercial motorcyclists‟ attitude and their practices of helmet wearing. The specific objectives were to determine the following among commercial motorcyclists in Dar es Salaam region: attitude of helmet use, proportion of commercial motorcyclists who wear helmet and the practice of helmet use. A cross-sectional survey was conducted in urban and peri-urban areas of Dar es Salaam region in May, 2011 at randomly selected commercial motorcycle parking points. A total of 273 conveniently selected eligible commercial motorcyclists participated. Face-to-face interviews were performed using a standard questionnaire while observation was conducted using an observation checklist. Data was analyzed using SPSS version 16.0**.**

All commercial motorcyclists were males, with the majority (64.8%) with primary education. The proportion of commercial motorcyclists who reported to wear helmet was 81.3%. However about two thirds of them (67.6%) reported to not wear helmet consistently. Helmet wearing was strongly predicted by having a positive attitude towards helmet for passengers (p=0.005), protective ability of helmet against head injury (p=0.003), wearing helmet during night (p=0.001) and wearing helmet even for the experienced rider (p=0.000).

However in a multiple regression model, it was found that those who agreed regarding the protective ability of helmet against head injury were more likely to wear helmet than those who disagreed (AOR: 0.279; 95% CI: 0.086-0.905); those who strongly agreed on wearing helmet during hot weather were more likely to wear helmet than those who disagreed (AOR: 0.039; 95% CI: 0.002-0.698). Those who strongly agreed on necessity for passengers to wear helmet and wearing helmet during night were more likely to wear helmet than those who were undecided (AOR: 0.091; 95% CI: 0.013-viii 0.617 and AOR: 0.114; 95% CI: 0.014-0.931 respectively). Those who had primary education were more likely to wear helmet than those who had no formal education (AOR: 6.146; 95% CI; 1.345-28.097). There was no significant difference in helmet wearing between urban and peri-urban areas (p=0.109). A small majority (52.7%) were observed wearing helmet, although 91.8% of them had no passenger's helmet. These findings indicate that despite the inconsistent helmet wearing, commercial motorcyclists had positive attitude towards helmet wearing.

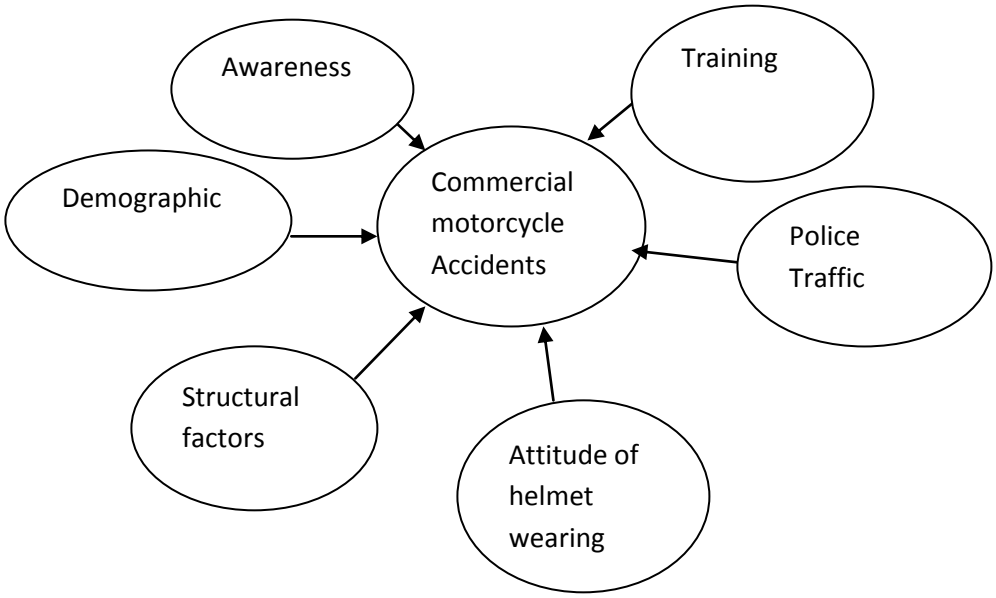
Helmet wearing is associated with the level of education and having a positive attitude towards helmet wearing. There is a high disparity on the observed helmet wearing between riders and passengers. Very few among the later were found to be wearing helmet.

2.10 Conceptual Framework

Conceptual frameworks (theoretical frameworks) are a type of intermediate theory that attempt to connect to all aspects of inquiry (such as problem definition, purpose, literature review, methodology, data collection and analysis). Conceptual frameworks can act like maps that give coherence to empirical inquiry. Because conceptual frameworks are potentially so close to empirical inquiry, they take different forms depending upon the research question or problem (Patricia Shields, 2008). Earp and Ennett (2001) define a conceptual framework as "a diagram of proposed causal linkages among a set of concepts believe to be related to a particular public problem. Conceptual

Framework is a set of concepts that are placed within a logical and sequential design. It represents less formal structure and used for studies in which existing theory is inapplicable. In this study the conceptual framework will be derived from the research variables and will seek to show the relationship between the independent and dependent variables.

Figure 1: Conceptual Framework of the study.



2.11 Research Gap

From literature review it has been found out that several studies have been done on issues around motorcycle accidents (Chang and Yeh, 2006; Stevenson & Ivers, 2008) for instance Julian et al., 2002) found out that per mile travelled, motorcycle riders have a 34 times risk of death than the drivers of other types of vehicles. They are also 8 times more likely to be injured (NHTSA, 2007).In spite of the critical accident factors being identified by past research and collected scientific opinions; there is no published data or

previous studies on the motorcycle accident. There are no enough accident data to expose the special details of motorcycle accident.

Few studies on road accidents in the country have been conducted. As a result, reasons behind them are well known. Going through the list of road accidents causes in our environment, public opinion surveys show that drivers are generally blamed for most of the fatal road accidents taking place now and then on our roads. They are mainly accused of speeding, dangerous overtaking and neglecting other traffic rules. Therefore, there is a need to carry out a study on the causes of accident among commercial motorcycle in Tanzania

2.12 Chapter summary

This chapter has explored the concept of factors causing commercial motorcycle accidents in Tanzania, case study at Morogoro Municipality. Forms of the causes of commercial motorcycle accidents have been pointed out. The chapter has also provided the importance of motorcycle for community development and prospects. The literature has shown that despite the important role of commercial motorcycle business to the community development there are still problems and obstacles. Several regulations such as Road transport Act and Traffic rules have been explained and have shown how the government is trying to eliminate commercial motorcycle accidents. Literature so far has shown that several countries have attempted to involve motorcyclists in the control and elimination of accidents. However, many African countries have still failed to minimize the occurrence of commercial motorcycle accidents.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Solomon (1997) defines research methodology as a "plan of attack" that best meets the needs of the defined problem. Kothari (2004) defines research methodology as a way to systematically solve the research problem.This chapter consists of three subparts: The first subpart highlights on research design, area of study and sampling techniques. The second subpart deals with data collection procedures and instruments. The last subpart is all about data analysis techniques.

3.2 Research Design

The research design used in this study is descriptive survey because the intention was to portray accurate profile of a problem under investigation. A descriptive survey approach was appropriate for individual researcher as it provided an opportunity to deduce information collected from the field. Survey design enabled researcher to collect large amount of data from a sizable population. Moreover survey design was adopted because the study intended to include more motorcyclists, also, the use of survey design important to ensure external validity of results hence easy to generalize about the findings.

Kothari (2004) notes that descriptive design is concerned with describing, recording, analyzing and reporting conditions that exist or existed. This study adopted qualitative research approach because qualitative approach assumes that social reality is within us and therefore the act of investigating reality has an effect on that reality. Furthermore, this approach emphasizes the subjective aspects of human activity by focusing on the meaning, rather than the measurement of social phenomena. It is believed that social reality is dependent on the mind and there is no reality independent of the mind. Thus,

what is researched cannot be unaffected by the process of the research. Leedy and Ormrod (2005) says that qualitative researchers believe that the researchers ability to interpret and make sense of what he or she sees is critical for understanding any social phenomenon. When conducting qualitative research, the investigator seeks to gain a total or complete picture.

According to Kothari (2004) a sampling frame is a complete list of all the members of the population that we wish to study. As this study focuses on the factors causing commercial motorcycle accidents in Tanzania especially at Morogoro municipality, then motorcyclists were selected randomly and appropriate number as representatives of the population (sample) whom invited to take part in the research. The study populations were: (a) users of official registered vehicles; (b) official recorded accident cases and (c) motorcycle accident victims.

3.3 Study Area

This study was conducted in Morogoro Municipality whereby a number of commercial motorcyclists were selected. The municipality was selected because it is where there are a large number of commercial motorcycles. The commercial motorcycle transport is cheaper and frequently used since the introduction of motorcycle business in Tanzania. There are more motorcycles especially during peak hours and on market days. Likewise Morogoro municipal was convenience for study as far as time and financial resources are concerned. Accessibility of data collections due to the fact that the area was convenience for study. Data collections covered several areas within the Municipality where commercial motorcyclists operate. The location includes Kihonda, Mafiga road, Morogoro urban bus stand, Msamvu bus terminal, Regional Hospital, Mazimbu Compus and the junction of Post Office Morogoro. The justification for selection was easier for data collection. Furthermore the commercial motorcyclists operate in groups which make it easy to interview them.

3.4 Study Population

Population refers to the total items, about which information is desired, Kothar (2006). It contains all items in the field. A population is the total collection of elements about which we wish to make some inferences. The population for this study was all commercial motorcyclists operating in Morogoro Municipality whereby a total of 1,380 commercial motorcycles were registered by Tanzania Revenue Authority (TRA) 2014 between November 2014 and mid-February 2015.

3.5 Sample size and sampling techniques

3.5.1 Sample size

A sample is a small group of respondent drawn from a population in which the researcher is interested in gaining information and drawing conclusions (Charles,2005).The sampling size was determined using non statistical method depend on the number of motorcyclist at Morogoro municipality. The study used the sample size 150 of respondents where by both simple random sampling were used in areas where many people and the population were homogenous, while purposively sampling were used to select key informants such as Police officers who records accidents and can be easily identified. The sample size were determined by using non statistical methods

3.5.2 Sampling procedure

This is the process of selecting number of individuals or object from population such that the selected group contains element which represents the characteristics found in the entire group. Sampling means drawing only a part of the population and study it and then making inferences about the population (Kothari, 2005). The sample used in this study comprised motorcyclists in Morogoro municipality, therefore, all had equal chance being selected and hence participated in the study. The motorcyclists were selected using random sampling for the reason of covering all them. In addition to that, the key informants were included in the sample size through deliberate sampling on the subject matter under study. The reason for opting to this sampling technique was belief that

respondents delivered the best result and unique information to satisfy the objectives of the research. The reason of this technique was to ensure that all individuals in the defined population were equal chance being selected. The study also used purposive sampling from various law enforcing departments including Tanzania Revenue Authority, Sumatra, and Police Traffic Officers selected randomly. The reason is simple, time and cost effective. In all selections gender were considered. The sample size selected provided sufficient data for the study despite the limitations. Sample distribution was as follows:

Table 3.1 Sample Distribution

Categories of Respondent	No. percent	Sampling techniques
Kihonda motorcycle station	20/150 x 100 = 13.33%	Simple Randomly
TOT Iringa (Mafiga) Road	20/150 x 100 = 13.33%	Simple Randomly
Morogoro Urban bus stand	20/150 x 100 = 13.33%	Simple Randomly
Msamvu Bus Stand	20/150 x 100 = 13.33%	Simple Randomly
Postal motorcycle stand	20/150 x 100 = 13.33%	Simple Randomly
Regional Hospital station	20/150 x 100 = 13.33%	Simple Randomly
Mazimbu compus	20/150 x 100 = 13.33%	Simple Randomly
Pedestrians	5/150 x 100 = 3.34%	Purposive sampling
TRA officials	1/150 x 100 = 0.67%	Purposive sampling
Sumatra officials	1/150 x 100 = 0 .67%	Purposive sampling
Police traffic officials	3/150 x 100 = 2.00%	Purposive sampling
TOTAL	100	

Source: Researcher Data 2015

3.6 Data collection Method

3.6.1 Questionnaires

The study adopted closed and open-ended questionnaires, which were prepared and distributed to motorcyclists to get required information. The type of information obtained includes demographic factors of commercial motorcyclist, causes of accidents among commercial motorcyclists, formal training prior to riding of motorcycle,

awareness of cycling regulations, challenges faced by Traffic Police in preventing accidents and motorcyclists attitude on wearing helmets. The questions were set in the way that, they were short and clear to facilitate the response from the respondent, Questionnaires were opted for data gathering because they are capable of covering a large number of respondents of the sample size for a short time and easy to administer.

3.6.2 Interviews

The study used unstructured interview to get detailed information for data gathering using interview. The researcher interviewed few selected key respondents. The reason of using this data collection technique was to allow a chance to communicate face to face with respondents and it provides chances to clarify issues so as get complete and detailed information about the topic under study. Key informants were TRA, Sumatra, and Traffic Police officers. At the police station, the process of police investigation of accident cases, resources involved, and number of recorded accident vehicles.

3.6.3 Focus group discussions

Focus group discussions (FGDs) for men and women groups were carried out in order to collect information based on their appreciation, understanding and involvement in motorcycle accidents in the past and consisted of victims, relations and other persons who were affected by motorcycle accidents. The setting for the FGD was at a popular motorcycle working/parking and repairer's shop. A moderator facilitated the discussions and a recorder took notes of the discussion. The FGD guide covered the causes of accidents, wearing of helmets, ages affected by accidents etc. The sessions were conducted in English and Kiswahili languages concurrently. The analysis was done according to the main themes of the FGD. The Traffic Police has facilitated the commercial motorcyclists to group into segments. Each segment comprises of ten to twelve motorcyclists. The groups are homogeneous and are scatted all over the Municipality

3.6.4 Data presentation.

The analysis of data collected has been presented qualitatively by using computer software of SPSS 20 version to analyze data. The data analyzed have been presented in tables, charts and graphs. The rationale to employ SPSS techniques is to simplify the interpretation, description and explaining findings related to individual opinions, view points, and their attitude towards factors causing accidents for commercial motorcycle in Morogoro Municipality.

3.6.5 Reliability

Reliability refers the extent to which the data collection yields consistency result between two measures of the same thing (Kothari, 1990), This will increase the transparency of the research. Reliability in the qualitative research is used to check the consistency of patterns as developed by other scholars (Creswell, 2002). Brewton and Millward (2001) argue that a researcher can ensure reliability by thorough description of the research process which will in turn increase transparency. For this study, questions were formulated and designed in such a way it did not create ambiguity.

3.6.6 Validity

Kothari (1990) defined validity as the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure. In other words, validity is the extent to which differences found with a measuring instrument reflect true differences among those being tested. This has been ensured throughout the research by basing the study on relevant literature and formulating methods of data collection used to collect the expected data. The instruments were designed to have sufficient control to ensure that ultimate conclusions drawn and generalizations were truly warranted by the data. The assessment of the validity also were checked through the sampling technique used to collect data and response rates as well as a copy of the survey instrument which is usually questionnaire through which data were collected.

3.7 Measurement of the Variable

Dependent variable

3.7.1 Causes of accidents among commercial motorcyclists

The dependent variable in this study was commercial motorcyclist's accidents. Motorcyclists and law enforcement officials were required to participate in obtaining causes of accidents among commercial motorcyclists. Data on participation dimensions were obtained by asking respondents the causes of accidents. The response were calculated into percentages.

3.7.2 Independent Variables

3.7.2.1 Demographic factors of commercial motorcyclists

Demographic factors of commercial motorcyclists were measured in terms of age, sex, marital status, education level and occupation of the commercial motorcyclists. The variables of age, sex, marital status, educational level and occupation were measured as follows: age in years, sex (1= female, 2 = male) and marital status (1 = married, 2 = single, 3 = widowed, 4= divorced). Education variable were measured by four- point scales ranging from 1 for primary school, 2 for secondary education, 3 for adult education and 4 for none. Occupation variable were measured by three point scales as 1 for agriculture, 2 for business and 3 for employment.

3.7.2.2 Formal training prior to riding

This study determined whether commercial motorcyclists had formal training prior to riding and were measured by two dimensions: whether or not the motorcycle rider training was offered in Morogoro Municipality and whether Government contributes to the funding of motorcyclists training programs. Then the percentages of ‘’yes’’ and ‘’no ‘’ was calculated.

3.7.2.3 Awareness of the cycling Regulations.

The commercial motorcyclists were measured by using awareness of cycling regulation. Respondent were asked to respond if they are aware of existence of cycling regulations. The cycling regulation measures included: motorcycle driving license, commercial motorcycle road license, commercial motorcycle insurance cover, registration number of motorcycle. Then percentages of ‘’yes’’ if and ‘’no’’ was calculated.

3.7.2.4 Challenges faced by traffic police in preventing accidents

The study measured the various challenges faced by traffic police in preventing accidents. The challenges included speeding, overtaking, wearing of helmets, drinking of alcohol and driving, road license, driving license, insurance cover note, ownership of motorcycle, examine motorcycle, and other impairments. Basing on the respondents’ responses then percentages of ‘’yes’’ and ‘’no’’ was calculated.

3.7.2.5 Motorcyclists attitude towards wearing helmets

The study determined motorcyclist’s attitude towards wearing helmets. Respondents were asked to respond on their attitudes towards wearing helmets while cycling. The percentages of strong agree, agree, disagree and strongly disagree was be calculated.

3.7.2.6 Structural factors causing accidents

Motorcyclists are more susceptible to difficulties and hazards on structural factors. They are particularly vulnerable to changes in the level of friction of road surface, pot holes, poor repair to the surface, drain covers, debris, road markings and others. Respondents were asked to respond on towards structural factors. Then percentages of ‘’yes’’ if and ‘’no’’ was calculated.

3.8 Data Analysis

Data analysis was done by using Statistical package for social scientists (SPSS) through preparing simple frequency distribution or bar chart for variables to form a base for

interpretation. For dependent variable SPSS was used to analyze the causes of accidents, frequency distribution, percentage, histogram and bar chart.

3.9 Chapter summary

This chapter has provided the research methodology applied in the study conducted in Morogoro Municipality in Tanzania. The study sample comprised motorcyclists from Mazimbu, Kihonda, Msamvu bus terminal, Morogoro regional hospital, Misufini area, Postal areas. In this study a cross-sectional design was adopted. Data collection was done through motorcyclist's questionnaires, in- depth interviews with the key informants, documentary review and discussions with government officials. Earlier pre testing was done at Mazimbu centre in Morogoro Municipality. Data collected through a questionnaire were analyzed through SPSS programme while data from in-depth interviews were analyzed qualitatively. The next chapter gives findings of the study.

CHAPTER FOUR
RESULT AND DISCUSSION

4.1 Introduction

In this chapter data analysis and presentation of results are discussed and interpreted. The analysis of Demographic factors of motorcyclists are discussed in the chapter. Causes of commercial motorcyclist accidents are discussed and analyzed. Commercial motorcyclist's formal training, Motorcyclist's awareness and Commercial motorcyclist's attitudes on wearing helmets are discussed thoroughly. Structural factors causing motorcycle accidents and the challenges faced by Traffic Police Force in preventing commercial motorcycle accidents are discussed in the chapter.

4.2 Demographic Factors of Motorcyclists

This section clarifies demographic features of the commercial motorcyclists on the respondents such as age, Sex, educational level and experience.

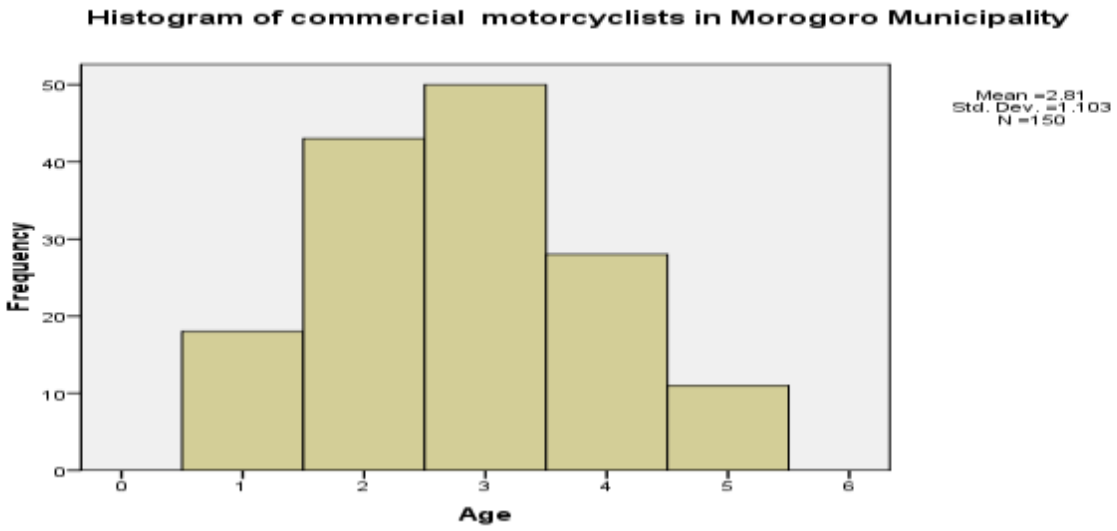
4.2.1 Age Distribution

Table 4.1: Respondents distribution by age

Age	Frequency	Percent
15 – 20	18	12
21 – 26	43	28.7
27 – 32	50	33.3
33 – 40	28	18.7
41 – Above	11	7.3
Total	150	100.0

Source: Field Data 2015

Figure 2: Respondents distribution by age



Source: Field Data 2015

The finding of figure 2 implies that the most group who operate commercial motorcycle businesses are young and middle group.

4.2.2 Respondent distribution by sex

Table: 4.2. Respondent distribution by sex

Sex	Frequency	Percent
Male	150	100

Source: Field Data 2015

The analysis of demographic of commercial motorcyclists by sex shows that all respondents who operate commercial motorcycle businesses are male 150 (100%). This indicates that there are no females in Morogoro Municipality who operate commercial motorcycle business. The commercial motorcycle businesses are dominated by male.

The finding is similar to the study done by Adisa, (2010) who observed that commercial motorcyclists are operated by male.

4.2.3 Educational level

Table 4.3 Distribution by educational level

Educational level	Frequency	Percentage
No formal education	7	4.7
Primary education	97	64.7
Secondary education	43	28.7
Graduate	3	2.0
Total	150	100.0

Source: Field Data

Table 4.3 shows the educational level of commercial motorcyclists, the finding revealed that 97 (64.7%) are primary level followed by secondary education 43 (28.7) and those with no formal education are 7 (4.7%) while 3 (2%) are graduate. This may account for why majority of these commercial motorcyclists are prone to accidents. Majority of business operators of commercial motorcycle are holders of Primary level education. This precludes the reason for occurrence of commercial motorcycle accidents following their inability to control their behaviors and decode road signs. The findings are similar to the study done by Ogagaogene, (2011) who observed that primary level group dominated the motorcycle business.

4.2.4 Experience in riding motorcycle

Table 4.4: Experience in riding motorcycle

Riding experience	Frequency	Percent
1 month – 3 month	2	1.3
3 month – 6 month	13	8.7
7 month – 1 year	27	18.0
1 year – 1.5 year	33	22.0
1.5 year – 5 year	53	35.3
6 year - and above	22	14.7
Total	150	100.0

Source: Field Data 2015

The table 4.4 reveals the years of experience since the respondents have been riding commercial motorcycle. It can be noted that 53 (35.3%) respondents had between 1.5 – 5 years of motorcycle riding experience, 33 (22%) have riding experience of 1 year to 1.5 years. While 27 (18%) have riding experience between 7 months to 1 year, 22 (14.7%) have riding experience of 6 – above years. The 13 (8.7%) of respondents have 3 months – 6 months and 2 (1.3%) have riding experience less than 3 months. It is clear from the table that the majority of the riders have riding experience of 1.5to 5 years which is not enough for road riding experience. This may be as a result of economic hardship and the increase in the rate of unemployment that led to the recent influx into the business. The physical stress imposed on cyclists is self-evident, however that on motorcyclists is also considerable with a dangerous operating environment, and violence and theft as ever-present threats. Lack of alternative employment and its profitability probably combine to compel adoption of the occupation.

4.3 Demographic factors of commercial motorcyclists and road accidents

The study examined the influence of demographic factors such as sex, age, and experience among other of the occurrence of road accidents. The study revealed that demographic factors such as age, education and experience were also related to practices such as wearing of helmet, overspending, overtaking and non-compliance to the roads rules and regulations. In this study the demographic factors as causes of Commercial Motorcycle accidents finding was similar with studies conducted in other developing countries. The reported demographic causes of motorcycle accidents vary around the world, from 22.8% in China to as high as 62% in Vietnam. In Nigeria, they vary from 12.8% -60% have been reported in different studies. In Uganda the reported demographic causes of boda boda was 25% of all causes. There is a male dominance in this study which is in agreement with several other reports. It is observed that nearly all commercial motorcyclists are males and riders constituted the single largest risk group. The study found out that male dominates the commercial motorcycle business in Morogoro Municipality. During the administration of this study, age of the motorcyclists has influence on the high risk-taking activities including recklessness riding, over-speeding and overloading their motorcycles, riding without wearing any protective gears. The study is similar to the study done by Mburza (2009) who concluded that there were significant relationships among age, educational background and the causes of accidents. The study is also similar to Jelalian et al (2001) who identified that risk taking behavior has significance influence to the occurrence of motorcycle accidents.

4.4 Causes of Commercial Motorcyclists Accidents

This section aimed at examining the causes of motorcycle accidents in Morogoro Municipality. Factors that causes commercial motorcyclist accidents in Morogoro Municipality are shown in Table 4.5

Table 4.5: Causes of Commercial Motorcyclists Accidents

Causes of motorcycle accidents	Frequency	Percentage
Speeding	34	22.7
Alcohol drinking and riding	15	10.0
Lack of detection	9	6.0
Rider fatigue	4	2.7
Lack of training	19	12.7
Non observance of traffic law	11	7.3
Receiving call while riding	2	1.3
Wrong overtaking	6	4.0
Bad road	5	3.3
Reckless riding	43	28.7
Others	2	1.3
Total	150	100.0

Source: Field Data 2015

Figure 4.5 indicates that reckless driving is the most contributing factor that leads to motorcycle accidents by 28.7%. Speeding is the second factor which contributes (22.7%) motorcycle accidents. Lack of training is the third factor 19 (12.7%) for causing commercial motorcycle accidents. The fourth factor that causes commercial motorcycle accidents is alcohol drinking and driving 15 (10%), followed by non-observance of traffic laws as the fifth factor 11 (7.3%). The sixth factor is lack of detection 9 (6%) of which wrong overtaking is the seventh factor that causes commercial motorcycle accidents 6 (4%). Bad road is the eighth factor that causes commercial accidents 5 (3.3

%). Ride fatigue is the ninth factor that causes commercial motorcycle accidents 4 (2.7%). Receiving calls while driving are the least factors that cause commercial motorcycle accidents contributing 1.3% of all accidents. The finding collaborate the earlier finding of Odero et al (1997); Salawu,(2008); Adisa, (2010) and Ngim and Udosen (2007) that reckless driving, over speeding, bad road, wrong overtaking , use of alcohol, poor knowledge of traffic rules are factors that are responsible for accidents among commercial motorcyclists.

The findings also revealed the causes of commercial motorcycle accidents have been found to include: reckless driving, over speeding, lack of training, non – observance of traffic laws, lack of detection, wrong over taking, bad road and alcohol drinking and driving. This study agrees with previous studies of Nakahara, Chadbunchachai, Ichnikawa, Tipsuntornsak, and Wakai (2005).

4.4.1 Structural factors causing motorcycle accidents

Respondents were asked whether structural factors contribute to motorcycle accidents.

Table 4.6: Structural factors causing motorcycle accidents

Structural factors	Strong agree	Agree	Neutral	Disagree	Strong disagree	Total
Road slippery	42	93	4	8	3	150
Road bumps	53	84	3	10	0	150
Over speeding	32	83	7	23	5	150
Retained water surface	8	38	6	85	13	150
Road defects	9	29	8	88	16	150

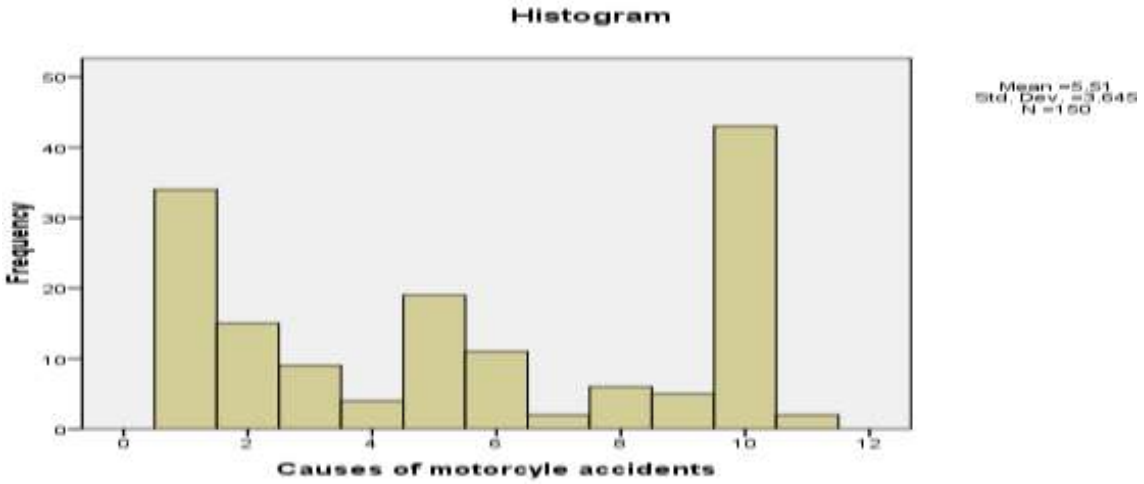
Source: Field Data 2015

Road defects in Morogoro also contributed to accidents of the commercial motorcycle operators 37% have suffered due to the bad state of the roads. The above table is an

assessment of the driving speed of the commercial motorcycle riders. Over speeding is a major factor responsible for the high rate of accidents among commercial motorcycle riders in in Tanzania.

The Tanzania Traffic Act (2009) maintained that the road safety speed to be maintained by motorcycle riders is fifty kilometer per hour (50 to 80km/h), and speed above that is regarded as over speeding. The finding was in support of the existing findings of (Horswill and Helman, 2003), that over speeding is a principal factor that causes accidents among motorcyclist riders in United Kingdom, and Taiwan respectively

Figure 3: Factors causing commercial motorcycle accidents.



Source: Field Data 2015

Figure 4 indicates that reckless driving, Speeding, lack of training and alcohol drinking and riding are the leading factors that cause commercial motorcycle accidents.

4.5 Commercial motorcyclist's formal training

The study aimed at examining as to whether commercial motorcycle rider had attended formal training during or before they started to engage in the particular business. Results are as shown in table 4.7

Table 4.7 Trainers of motorcyclists

Trainers of motorcyclists	Frequency	Percentage
Friend	69	46.00
Myself	46	30.67
Traffic police	11	7.33
Institution	24	16.00
Total	150	100.0

Source: Field Data 2015

Table 4.7 shows that a total of 115 (76.7%) of the commercial motorcyclists were trained by friends or themselves as formal training to operate the business. Only 35 (23.3%) had formal training from Traffic Police or other Institutions. The findings do not corroborate with the earlier findings of Mortimer, 1984, 1988; Sattern, 1980; Shepard, 1986), where respondents were required to attend classes for classroom instruction followed by practical on cycle training. The classroom instruction should include lectures, films, discussions and tests. Lack of motorcycling training to motorcyclists is the causes of commercial motorcycle accidents as shown in the above table. This finding implies that most of the riders lacks formal training which leads to the increase of accidents in Morogoro Municipality.

4.5.1 Duration of training

The study sought to discuss the level of training received by the commercial motorcycle riders before embarking on motorcycle riding business. Results are shown in Table 4.8

Table 4.8: Duration of training

Duration of training	Frequency	Percent
I day – 3 days	17	11.3
1 week – 4 weeks	53	35.3
1 month – 3 months	57	38.0
4 months – 1 year	17	11.3
Above one year	6	4.0
Total	150	100.0

Source: Field Data 2015

Table 4.8 shows the level of training of the commercial motorcycle riders before embarking on motorcycle riding business. There are 57 (38%) respondents trained between 1 month to 3 months, followed by 53 (35.3%) trained between 1 week – 4 weeks. The 17 (11.3%) respondents were trained between one day – 3 days others between 4 months – 1 year. Only 6 (4%) were trained above one year. It can be seen from the above table why there is an incessant increase of accidents among commercial motorcycle riders. Lack of adequate training of the riders contributes to the occurrence of accidents among motorcyclists. There are 110 (73.3%) respondents trained by themselves or their friends between 1 week to 3 months. It is expected that the training duration should be not less than one and half year, if sanity to be maintained on the highways. It can be seen from the above table why there is incessant increase of accidents among commercial motorcycle riders due to inadequate training of the riders.
The findings imply that respondents do not have formal education which is prone to the occurrence of motorcycle accidents. On the other hand training period is not enough to

be conversant on riding the motorcycle. This may account for high level of ignorance among them as most of the motorcyclist cannot interpret road traffic regulations or signs. It was in support of finding of Ngim and Udozen (2007). The study reveals that though the respondents understudied claimed to have attended formal training, majority of the motorcyclists are trained between 1 week and 3 months. The period which is not enough for motorcycle safe riding.

4.5.3 Motorcyclists awareness of training

The study aimed at examining motorcyclists' awareness of training related to motorcycle riding. Results are as shown in Table 4.9

Table 4.9: Awareness on training

Awareness on training	Frequency	Percent
Yes	141	94.0
No	9	6.0
Total	150	100.0

Source: Field Data 2015

Table 4.9 shows that 141 (94%) of the respondents operating commercial motorcycle business in Morogoro Municipality are aware on the importance of training. As per table 4.7 most of the motorcyclists are being trained by friends or motorcyclist themselves. This preclude that the type of education they have are not efficiency to enable them drive safely. Safe driving education is still required. The finding implies that majority of the commercial motorcyclists in Morogoro Municipality are not aware about the importance of formal training. Likewise this signifies that motorcyclists should receive motorcycle formal training. The licensing authorities should enforce new riders to take

formal training as compulsory basic training before issued with license. These findings are similar to the study done by Cox (2010), who found out that most motorcyclist were not aware about formal training, and he found that the trained riders committed fewer errors immediately after they had been trained.

4.6 Awareness on having driving license

This section aimed at examining the extent to which commercial motorcyclist in Morogoro Municipality are aware about the importance of having driving license. Results are as shown in Table 4.10

Table 4.10: Awareness on having driving license

Awareness on having driving license	Frequency	Percentage
Yes	93	62.0
No	57	38.0
Total	150	100.0

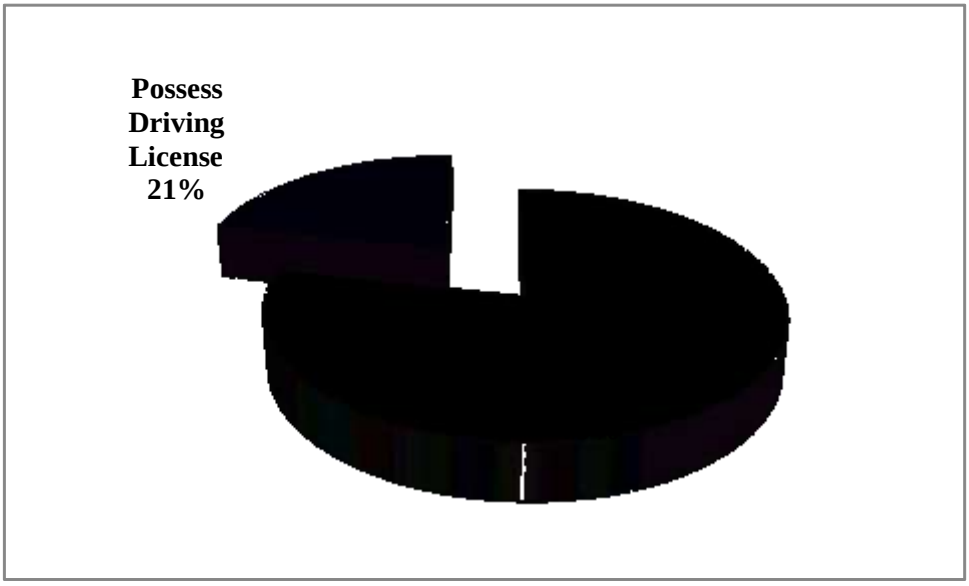
Source: Field Data 2015

Table 4.10 shows that 93 (62%) of the respondents are aware of owning driving license while 57 (38%) are not aware to own driving license. This means that the Government does not collect revenues from motorcyclist's equivalent to 38%. The study found that majority of the motorcyclists don't possess driving license. Likewise, it was revealed that majority of the motorcyclists don't own driving license.

The study also examined the views of respondents about the awareness and possession of license had effect on accident or casualty risk. The low levels of awareness about driving license may in part be due to the fact that most of motorcyclists poses primary level education. This might be one of the critical factors why commercial

motorcycle accidents are on the increase, because those who ride motorcycle for commercial purposes are not permitted by the government to do so.

Figure 4: Possession of Driving Licenses among cyclist



Source: Field Data 2015

4.6.1 Awareness of wearing protective clothing

In this section the study sought to determine the awareness of motorcyclist in Morogoro on concerning the usefulness of protective cloth and how they can be used for protection against accidents. Results are as shown in Table 4.11.

Table 4.11: Awareness of wearing protective clothing

Awareness of wearing protective wearing	Frequency	Percent
Yes	117	78.0
No	33	22.0
Total	150	100.0

Source: Field Data 2015

Table 4.11 shows that 117 (78%) of the respondents wear protective clothing when driving motorcycle compared to 33 (22%) who do not wear protective clothing. According to Elliot et al. (2003), choosing the right protective clothing can achieve the following protection: Prevention of most laceration and abrasion injuries that occur when a rider slides on the road surface after falling off. Prevention of contamination of open fractures by road dirty, reduction in the severity of contusions and fractures, with the prevention of some fractures and joint damage, prevention of accidents by maintaining the rider in good psychological condition by keeping the rider dry, warm, comfortable and alert. Protective clothing that contains fluorescent and reflective material will increase the conspicuity of the rider, and hence help to reduce the likelihood of an accident occurring in the first place. Some motorcyclist groups are not convinced that the benefits of high visibility clothing for motorcyclists have been proven. The study found out that, while riders of motorcycles may be willing to wear protective clothing, it is less likely that moped and scooter riders will do so. These riders tend to ride in their normal clothes which offer little protection from abrasion and impact injuries.

4.6.2 Awareness of road traffic Act

This section aimed examining the awareness of the existence of road traffic Act. Results are as indicated in Table 4.12

Table 4.12: Awareness of road traffic Act

Awareness of road traffic Act	Frequency	Percent
Yes	113	75.3
No	37	24.7
Total	150	100.0

Source: Field Data 2015

Table 4.12 shows that 113 (75.3%) of the respondents are aware of the Road Traffic Act while 37 (24.7%) are not aware about Road Traffic Act. This finding implies that most of the respondents who took part in this study are aware of the existence of road traffic act, however, it was revealed that most of the respondents are did not know what exactly did the act stipulate about road accidents, this might be because most of them are not well educated in they obtained their training informally.

From the research most of the operators within the county do not have driving licenses which is illegal according to the traffic Act 2009. Valid driving licenses are indications that operators have gone through requisite training at recognized training schools and passed their classes of motorcycles. Further, the OSHA, 2007 Act section 55 states that "all machinery, whether fixed or mobile for use either at workplace or as workplace shall only be used for the work which it is designed for and be operated by a competent person". This helps in ensuring that one understands the rules and procedures in place when using the machine. Likewise during the administration of this study respondents complained that although they are aware about the existence of traffic act but its enforcement is difficult due to inadequate resources, administrative problems, and corruption. It was revealed that corruption is a huge problem often creating a circle of blame the police blames drivers and the public, the public blames drivers and the police, and drivers blame the police.

4.6.3 Awareness of Road Traffic Signs

This section aimed at examining the level of awareness of the motorcyclist in Morogoro, the intention was to understand if the level of awareness had influence on the occurrence of accidents in the region. Results are shown in Table 4.13.

Table 4.13: Awareness of Road Traffic Signs

Awareness of road traffic signs	Frequency	Percent
Yes	120	80
No	30	20
Total	150	100.0

Source: Field Data 2015

Table 4.13 shows that 120 (80%) of the respondents are aware of Road Traffic signs while (20%) were not aware about road traffic signs. This might be because most of them they did not receive or attend formal training or because they have low academic qualifications. During the administration of this study it was revealed that some of the roads do not have road signs. Similar findings were reported by Elliot, Baughan and Sexton, (2007) who found out those motorcycle accidents was a result of combination of human errors and failures, poor road signs, adverse road conditions, and vehicle defects. It was noted that the most important aspect of the human factor are the age of the motorcyclists, medical fitness of the motorcyclist, alcoholic consumption pattern, fatigue, mental status and educational level (Elliot et al. 2007).

4.6.4 Awareness of Pedestrian Crossing

The study sought to examine the extent to which pedestrian crossing might influence the occurrence of motorcycle accidents. Results are as shown in Table 4.14.

Table 4.14: Influence pedestrian crossing on the occurrence of motorcycle accidents

Awareness of pedestrian crossing	Frequency	Percent
Yes	145	96.7
No	5	3.3
Total	150	100.0

Source: Field Data 2015

Table 4.14 shows that 145 (96.7%) of the respondents are aware of the Pedestrian Crossing while 5 (3.3%) are not aware about Pedestrian Crossing. The finding implies that awareness of pedestrian crossing is not the factor that causes motorcycle accidents. This implies that drivers do not pay attention to the right-of-way to pedestrians crossing streets in marked or unmarked crosswalks in most situations. The study found out that most of the motorcycle riders are not careful at intersections and often occurs when drivers are turning onto another street and a pedestrian is in their path. Based on the available findings it is suggested that in order to avoid motorcycle accidents both drivers and pedestrians have to be aware of their responsibilities. Extra precaution must be taken around those who are less able-bodied and take longer to cross the street, especially children and the elderly. However, the study found out that, there is no complete list of steps to take in order to guarantee that a pedestrian accident will not occur. Instead, it's important to exercise due care and consider the actions taken on potentially dangerous situations.

4.6.5 Awareness of wearing helmets when riding

In this section the focus was on helmet use behavior among motorbike users in Morogoro Municipality. Detailed data were collected for the purpose of study. To guide the empirical analysis, the study relied on a simple model in which drivers decide on self-protection and self-insurance. This was based on the idea that risk averse drivers are

more likely to wear a helmet. Helmet use are related with educational level, drivers who shows higher awareness of road risks are more likely to wear helmet and to speed less. Results are shown in Table 4.15

Table 4.15: Awareness of wearing helmet

Awareness of wearing helmet	Frequency	Percent
Always	116	77.3
Near always	20	13.3
Sometimes	13	8.7
Never	1	0.7
Total	150	100.0

Source: Field Data 2015

Table 4.15 shows that 116 (77.3%) of the respondents always aware of wearing helmet while riding commercial motorcycle. 20 (13.3%) of the respondents wear helmet and riding nearly always while 13 (8.7%) of the respondents sometimes are aware of wearing helmet and riding commercial motorcycle. Only 1 (0.7%) are not aware of wearing helmet while riding commercial motorcycle. The finding implies that most of the commercial motorcycle riders in Morogoro Municipality do not use helmet as protective tool. Likewise during the administration of this study it was founded out that riders with old age seemed to wear helmet than those young riders. This finding is similar to the finding of other authors (Ackaah and Afukaar, 2010). The reason behind not wearing helmet among those in the young age may be due to the fact that young people generally tend to adopt risky behaviour and attitudes as compared to their elder counterparts.

Among participants who reported to not wear helmet, the most frequently mentioned reason behind the practice were helmets are not of good quality and are not comfortable. The low quality of helmets has been mentioned by other author (Peek-Asa et al., 2009) and may be partly expounded by the lack of focus on the matter by the quality regulatory bodies. The mentioned reason that helmet is not comfortable corresponds to the finding of another study done in Iran whereby one of the reasons given for poor compliance to helmet wearing was that helmets were designed to be used in temperate countries and were uncomfortable to use in hot weathers (Zargar et al., 2006). Most participants agreed that wearing helmet is necessary and helmet reduces head injury in case of accident. This finding is somewhat similar to the study done in Nigeria whereby it was found that majority of participants acknowledged the benefits of helmet (Oluwadiya, 2008). This shows that many commercial motorcyclists are aware of the benefits of helmet wearing. However, there is evidence that the helmet comes off the head in some accidents, and that the protection offered against chin impacts is inadequate riders who suffer chin impacts frequently suffer fractures to the base of the skull - the most threatening head injury.

Some respondents suggested that the extra weight of a helmet actually increases the risk of neck injuries, but research has found no evidence to support this. Full faced helmets offer greater protection against facial and chin injuries than open-faced helmets, but may slightly increase the risk of injury to other parts of the head.

4.7 Motorcyclists who are involved in motorcycle accidents

The study sought to determine the extent to which motorcyclist are involved in accidents. During the administration of the study questionnaires and interviews were used as tools for data collection. Results are shown in Table 4.16

Table 4.16: Motorcyclists who are involved in motorcycle accidents

Motorcyclists involved in accidents	Frequency	Percent
Yes	66	44.0
No	84	56.0
Total	150	100.0

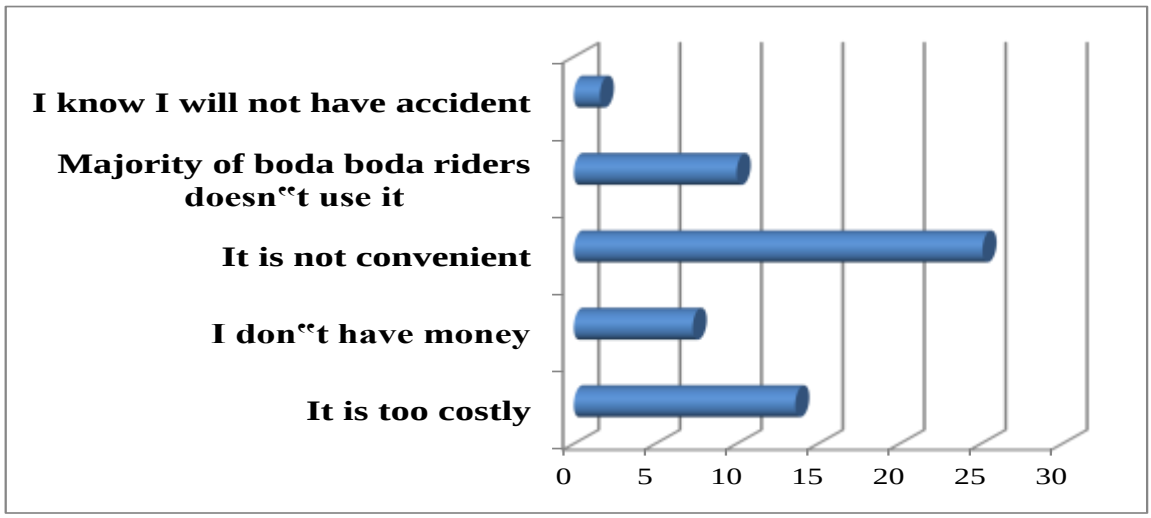
Source: Field Data 2015

Table 4.16 shows that 66 (44%) respondents were involved on motorcycle accidents while 84 (56%) respondents were not involved in commercial motorcycle accidents. The rate for those involved in accident (44%) is still high which depict that motorcycle safe driving education is still required among motorcyclists. Yuhara, Oguchi and Ochiai (1993) note that '' the purpose of safe driving education by riding simulator is to predict and forecast dangerous situations that take place in dangerous traffic scenes and to drive defensively''. Simulators allow riders to experience dangerous situations that could not be safely incorporated in on road training. The Australia Post (1988) study of motorcycling injuries pointed out the need for refresher training for those who had been riding for a number of years because of changes in the road rules. An added advantage of training programs for experienced motorcyclists is the potential to train riders who may have missed training at the recruiting stage. Attention needs to be paid on this issue also. Motorcycle training should focus on crash avoidance; it can also include learning on how to minimize injury if a crash cannot be avoided.

4.8 Reasons why commercial motorcycle riders does not possess safety helmet

The study aimed at examining the reasons behind reasons why commercial motorcycle riders does not possess safety helmet. Results are as shown in Figure 6

Figure 5: Reasons why motorcycle riders does not possess safety helmet.



Source: Field Data 2015

Interview with commercial motorcyclist revealed that the following are the challenges as to why most commercial motorcycle riders do not have safety helmet. Figure 6 above (42.4%) respondents remarked that the reason why they fail to possess a crash helmet despite danger/threat to life by it non utilization when accident occurred was that there was no penalty for it. While (25.1%) respondents said it inconvenient them, (13.6%) respondents noted it was too costly, (10.0%) respondents are negatively influenced by other motorcycle riders who does not use it, (7.3%) respondents said it was as a result of financial constraints that made them not to possess one, while (1.6%) respondents base their decision on the assumption that they will not have accident.

4.9 Structural factors causing motorcycle accidents

4. 9. 1 Road is often overlooked as a motorcycle hazards

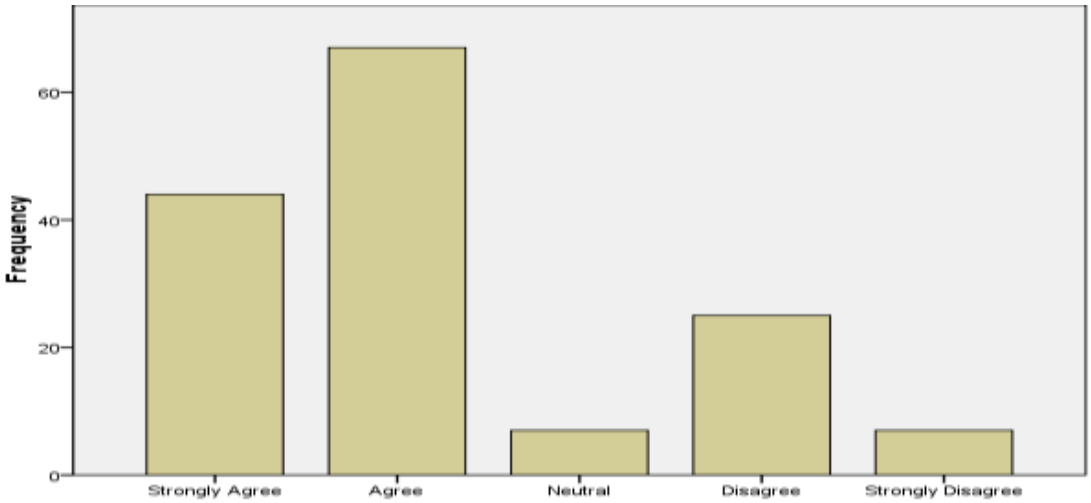
Table 4.17

Road looked as motorcycle hazard	Frequency	Percent
Strong agree	44	29.3
Agree	67	44.7
Neutral	7	4.7
Disagree	25	16.7
Strong disagree	7	4.7
Total	150	100.0

Source: Field Data 2015

Table 4.17 indicates that 44 (29.3%) of the respondents strongly agree that road is looked as motorcycle hazard. 57 (44.7%) agree that rood is looked as motorcycle hazard. 7 (4.7% 0 are neutral. 25 (16.7%) disagree that rood is looked as motorcycle hazard and 7 4.7%) strongly disagree that road is looked as motorcycle hazard. This suggest that 111 (74%) of the respondents agree that road is looked as motorcycle hazard. Being two wheelers, commercial motorcyclists are more susceptible to risks and hazards created by design, construction, maintenance and surface condition of roads. They are vulnerable to changes in the level of friction of road surfaces, holes, uneven surfaces, poor repair to the surface, drain covers, debris and road markings.

Figure 6: Road is often overlooked as a motorcycle hazards



Source: Field Data 2015

Figure 7 indicates that majority of respondents (74%) agree that road is overlooked as motorcycle hazards.

4. 9.2 Road familiarities is not important

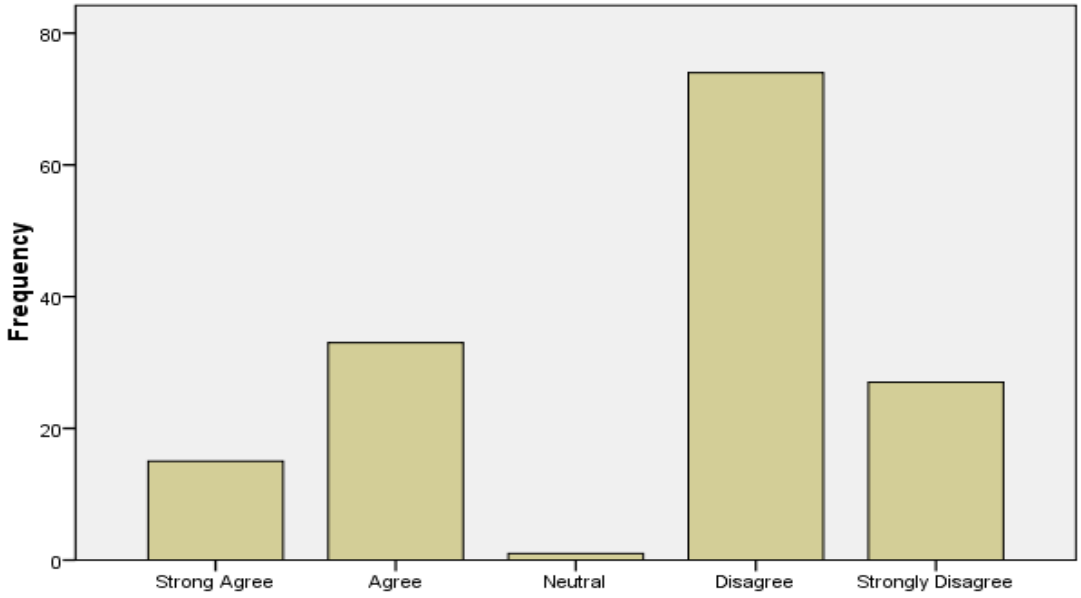
Table 4.18

Road familiarity is not important	Frequency	Percent
Strong agree	15	10.0
Agree	33	22.0
Neutral	1	0.7
Disagree	74	49.3
Strong disagree	27	18.0
Total	150	100.0

Source: Field Data 2015

Table 18 indicates that 15 (10%) of the respondents strongly agree that road familiarity is not important while 33 (22%) agree that road familiarity is not important. Only 1 (0.7%) is neutral. There are 74 (49.3%) disagree that road familiarity is not important and 27 (18%) strongly disagree that road familiarity is not important. This suggest that 101 (67.3%) of the respondents disagree that road familiarity is not important.

Figure 7: Road familiarity is not important



Source: Field Data 2015

Figure 8 reveals that road familiarity is not important. The same implies that if the road infrastructural is good with all traffic signs, road familiarity is not important.

4. 9. 3 Slippery during rain cause accidents

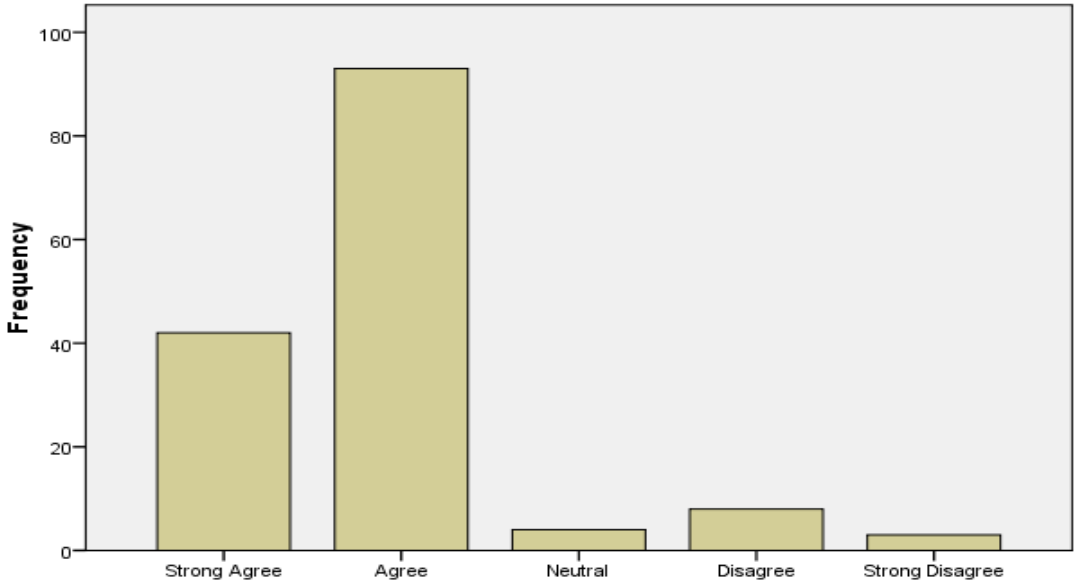
Table 4.19 Slippery during rain cause accidents

Slippery during rain cause accidents	Frequency	Percent
Strong agree	42	28.0
Agree	93	62.0
Neutral	4	2.7
Disagree	8	5.3
Strong disagree	3	2.0
Total	150	100.0

Source: Field Data 2015

Table 4.19 above indicates that 42 (28%) of the respondents strongly agree that road slippery during rain cause accidents while 93 (62%) agree that slippery during rain cause accidents. Those who were neutral were 4 (2.7%) and 8 (5.3%) disagree that slippery during rain cause accidents. The rest 3 (2%) strongly disagree that slippery during rain cause accidents. This suggest that 135 (90%) of the responds agree that slippery during rain cause accidents.

Figure 8: Slippery during rain cause accidents



Source: Field Data 2015

Slippery during rain cause motorcycle accidents as revealed by 135 (90%) of the respondents

4. 9. 4 Road bumps are good designed and not dangerous

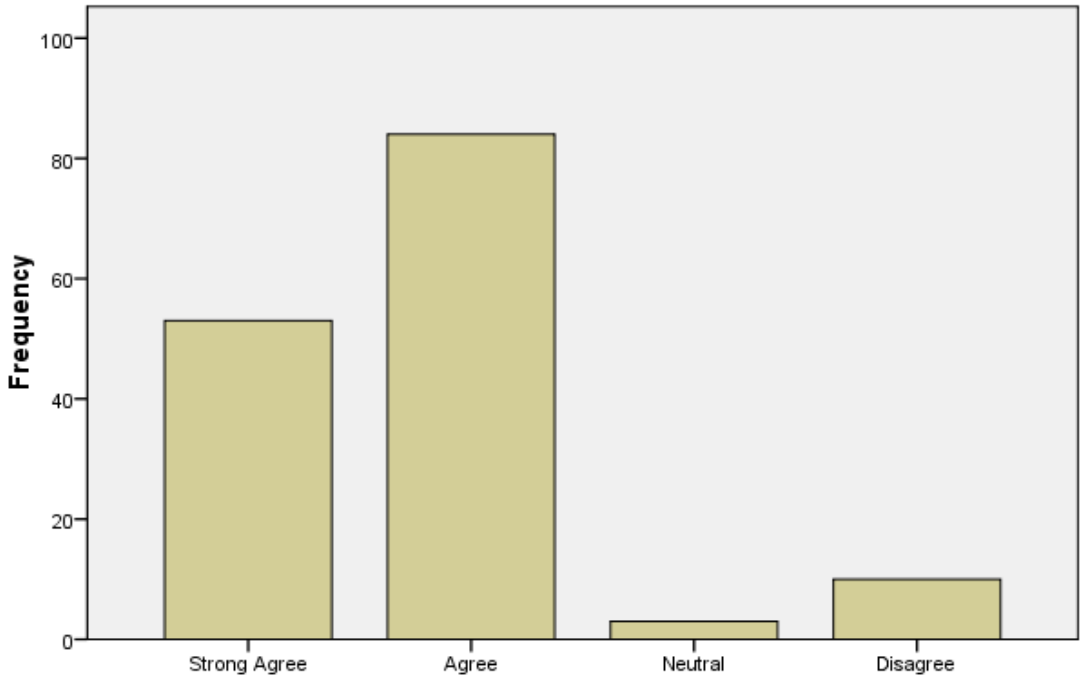
Table 4.20

Good designed bumps are not dangerous	Frequency	Perce
Strong agree	53	35.3
Agree	84	56.0
Neutral	3	2.0
Disagree	10	6.0
Total	150	100.0

Source: Field Data 2

Table 4.20 indicates that 53 (35.3%) of the respondents strongly agree that road bumps are good designed and not dangerous. 84 (56%) agree that road bumps are good designed and not dangerous. 3 (2%) are neutral. 10 (6.7%) disagree that road bumps are good designed and not dangerous. This suggest that 137 (91.3%) of the respondents agree that road bumps are good designed and not dangerous.

Figure 9: Road bumps are good designed and not dangerous



Source: Field Data 2015

Figure 10 reveals that 84 (56%) of all respondents of commercial motorcycle operators within the Morogoro Municipality agree that road bumps are good designed and not dangerous. They are supported by 53 (35.3%) of the respondents who strongly agree that road bumps are good designed and not dangerous.

4. 9. 5 Road improvements reduces motorcycle accidents

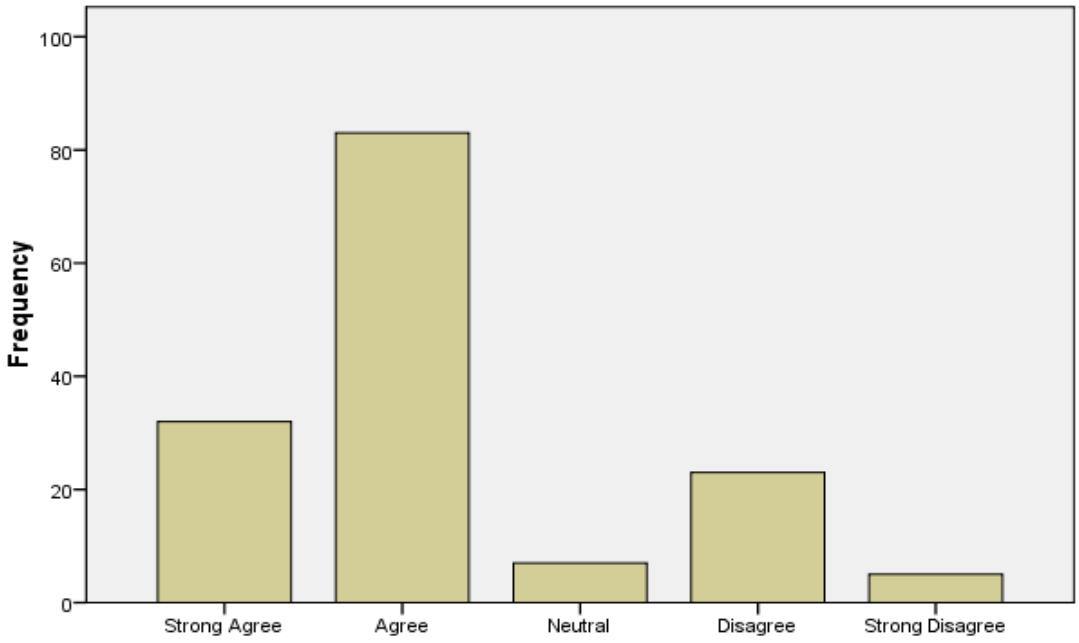
Table 4.21

Improved road reduces motorcycle accidents	Frequency	Percent
Strong agree	32	21.3
Agree	83	55.3
Neutral	7	4.7
Disagree	23	15.3
Strong disagree	5	3.3
Total	150	100.0

Source: Field Data 2015

Table 4.21 above indicates that 32 (21.3%) of the respondents strongly agree that road improvement reduces motorcycle accidents, 83 (55.3%) agree that road improvement reduces motorcycle accidents. 7 (4.7%) are neutral. 23 (15.3%) disagree that road improvement reduces motorcycle accidents. 5 (3.3%) strongly disagree that road improvement reduces motorcycle accidents.

Figure 10: Road improvement reduces motorcycle accidents



Source: Field Data 2015

Figure 11 indicates that 83 (55.3%) of the respondents who operate commercial motorcycle business within Morogoro Municipality agree that road improvement reduces motorcycle accidents. They are supported with 32 (21.3%) of all respondents who strongly agree that road improvement reduces motorcycle accidents.

4. 9. 6 Retained water surface during rain do not cause accidents

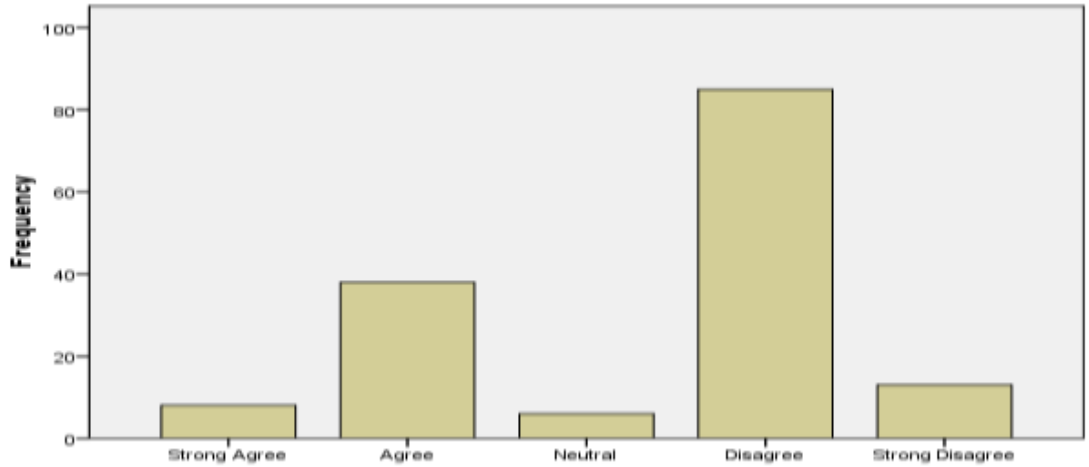
Table 4.22 Retained water surface during rain do not cause accidents

Retained water surface during rain do not cause accidents	Frequency	Percent
Strong agree	8	5.3
Agree	38	25.3
Neutral	6	4.0
Disagree	85	56.7
Strong disagree	13	8.7
Total	150	100.0

Source: Field Data 2015

Table 4.22 shows that 8 (5.3%) of the respondents strongly agree that retained water surface during rain do not cause accidents. 38 (25.3%) of the respondents agree that retained water surface during rain do not cause accidents. 6 (4%) are neutral, 85 (56.7%) disagree and 13 (8.7%) strongly disagree that retained water surface during rain do not cause accidents. Therefore a total of 98 (65.4%) of the respondents agree that retained water surface during rain cause accidents.

Figure 11: Retained water surface do not cause accidents



Source: Field Data 2015

The figure 12 above shows that 85 (56.7%) of all respondents of the commercial motorcyclists within Morogoro Municipality disagree that retained water surface during rain do not cause accidents. They are supported with 13 (8.7%) of the respondents who strong disagreed that retained water surface during rain do not cause accidents.

4. 9. 7 Road surface defects can't cause motorcycle accidents

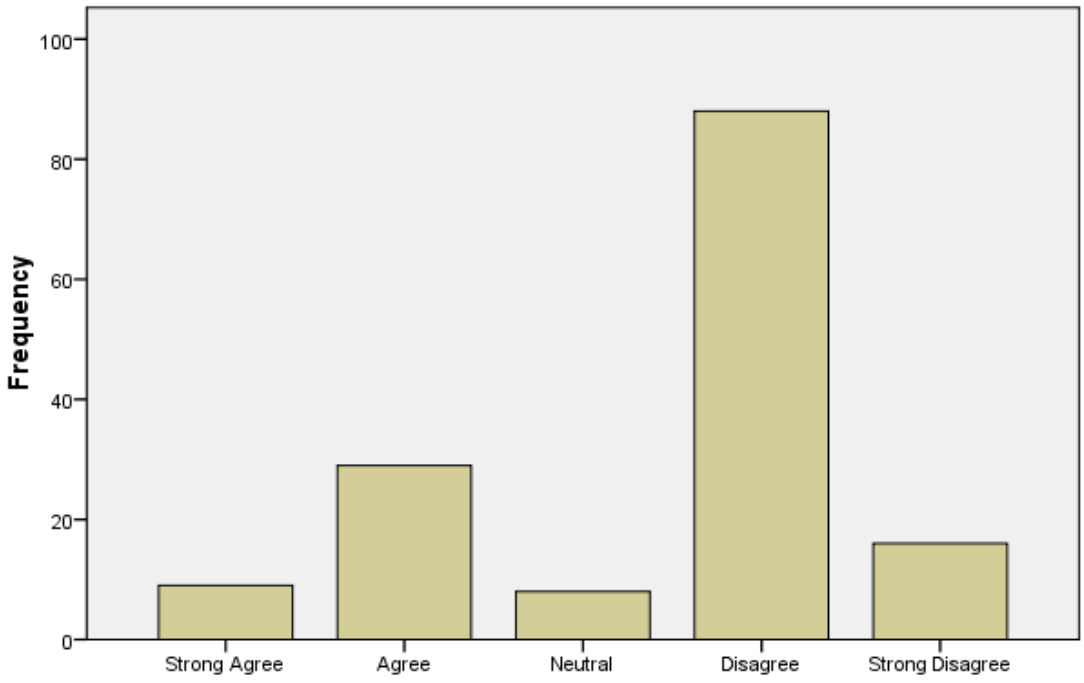
Table 4.23

Road surface defect can't cause motorcycle accidents	Frequency	Percent
Strong agree	9	6.0
Agree	29	19.3
Neutral	8	5.3
Disagree	88	58.7
Strong disagree	16	10.7
Total	150	100.0

Source: Field Data 2015

Table 4.23 indicates that 9 (6%) of the respondents strongly agree that road surface defects can't cause motorcycle accidents. 29 (19.3%) of the respondents agree that road surface defects can't cause motorcycle accidents. 8 (5.3%) of the respondents are neutral. 88 (58.7%) of the respondents disagree that road surface defects can't cause motorcycle accidents. 16 (10.7%) of the respondents strongly disagree that road surface defect can't cause motorcycle accidents. The table 4.31 concludes that 104 (69.4%) of all respondents agree that road surface defects can't cause motorcycle accidents.

Figure 12: Road surface defect can't cause motorcycle accidents



Source: Field Data 2015

Figure 4.13 indicates that 88 (58.7%) of the respondents of commercial motorcycle operators within Morogoro Municipality disagree that road surface defect can't cause motorcycle accidents. They are supported with 16 (10.7%) of the respondents who strongly disagree that road surface defects can't cause motorcycle accidents

4.10 Challenges faced by Traffic police in preventing commercial motorcycle accidents

4.10.1 Challenges regarding excess speed

The main objective of traffic police is to enforce laws and regulations. By enforcing the law the traffic safety and accident prevention is increased. Traffic police management promote and enforce good road use practices and discipline among all road users.

Excess speed is by far the most frequent road traffic offence. The problem of excess and inappropriate speed is the most common and the most severe road safety problem. Both crash frequency and crash severity increases as driving speed increases. Enforcing lower speed limits when vulnerable road users are involved is very beneficial. Excessive speed is a big challenge to Traffic police

4.10.2 Challenges against alcohol, drugs and fatigue

Drinking and driving is relatively infrequent, compared to other traffic offences. Crashes under the influence of alcohol are in general more severe. Traffic police have challenges for enforcement strategies against drinking and driving to reduce casualties. Some of the non-alcohol related offences that comparably severe are drugs and fatigue (sleeping while driving)

4.10.3 Challenges of excess carriage of passengers and loads

With a motive to generate more money motorcyclists carries more than one person in addition to the motorcycle rider commonly known as mishikaki in Swahili terms. Carriage of more than one passenger causes commercial motorcycle accidents. On other incidence the commercial motorcycle riders carries excessive loads including bags of charcoal which are vulnerable and dangerous for other road users. Excessive carriage of passengers and goods by motorcyclists is the challenge to the Traffic police

4.10.4 Resistance of the commercial motorcyclists to attend formal training before riding

Most of the commercial motorcyclists have not attended formal training before riding. The commercial motorcyclists are reluctant to coordinate with police and other institutions for formal training. Rider education and training have important effects on the reduction of motorcycle accident rate. This is also a challenge to the Traffic Police.

4.10.5 The greatest threat faced by motorcyclists to the roads

The study from Police Traffic Morogoro Region revealed that over speeding, driving without license, un helmeted motorcyclists and un willingness of the motorcyclists to attend training provided by the Police are the greatest threat to motorcyclists. Motorcyclist's attitudes that Police will apprehend them are also a challenge to attend the training program. There is a negativity behavior among the motorcyclist to attend the program which is a challenge to the Police.

4.11 Chapter summary

This chapter has given the results on the factors causing commercial motorcycle accidents; performance of commercial motorcycle business and the attitude of communities towards the businesses.

Findings have also been given on the causes of commercial motorcycle accidents and the contribution of government efforts towards eliminating the accidents. The next chapter gives conclusions drawn from the findings and the recommendations to the stakeholders of commercial motorcycle business.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, summary of the study, conclusion, recommendations and need for further research are presented. The main purpose of the study was to identify Factors Causing Motorcyclists Accidents in Tanzania, the Case of Morogoro Municipality. The study was conducted through questionnaires and interviews to the selected sample and data were collected and analyzed using SPSS. The study presents the conclusions from the present analysis, recommendations and further identification of the areas to be researched in the future.

5.2 Conclusion

Based on the findings of this study, the following conclusions are drawn. The study reveals that over speeding, alcohol drinking and driving, lack of detection, rider fatigue, lack of training, non-observance of traffic laws, wrong overtaking, road infrastructures and reckless driving account for higher percentage of factors that causes motorcyclists accidents in Tanzania. This study shows that the commercial motorcycle riders do not comply with Tanzania Road Traffic Act. They are contravening with the Acts deliberately for purpose of generating more income at a time. They carries two or more passengers at a time, do not use safety equipment's like helmets, do not wear protective clothing when driving, riding motorcycle without license, they take alcohol and drive. All these contravene with Tanzania Road Traffic Act which ultimately causes fatal accidents motorcycle riders.

5.3 Recommendations

Based on the findings of this study, the following proposals are made;

Regarding research objective one, the demographic features to the study revealed

that most of the commercial motorcyclists are youth with Primary level education. It is proposed that the Government of Tanzania should create employment opportunities for youth as this will go along in the reduction of youth who have been employed to commercial motorcycle business as a result of unemployment in the country.

Regarding research objective two, causes of the motorcyclists accidents have been found to be influenced by human behavior. Reckless driving, Speeding, alcohol drinking and riding are among the causes of commercial motorcycle accidents. This study has revealed that most of the commercial motorcyclists are young with Primary level education. It is proposed that the law enforcement agents including traffic police and SUMATRA should be strict for those commercial motorcyclists who violate traffic rules and regulations. There should be strict penalties against anybody contravening the road traffic rules including over speeding, alcoholic drink and driving, un helmeted riders, caring more than one passenger and other offences. Road infrastructure should continuously be improved.

Regarding research objective three, about formal training of commercial motorcyclists. This study revealed that most riders of the commercial motorcycles are people with primary level education. Others have not even completed the primary level education. It is proposed that Government should institute Training Policy before motorcyclists issued with road license. That is the commercial motorcyclists should posses road license after attending motorcycle training course from reliable institution in Tanzania.

Regarding research objective four, commercial motorcyclist's awareness of cycling regulations. This study has revealed that most of the riders of commercial motorcycles are not aware of cycling regulations. Others have not heard about Road Traffic Act operating in the country. It is proposed that funds should be made by the for the creation of road safety awareness, using different media of communications as a form of National orientation.

Regarding research objective five: Challenges faced by Traffic Police in preventing accidents. This study has revealed that Traffic Police has an important role towards elimination of road accidents. As the law enforcing agents Traffic Police and other departments entrusted with law enforcement should be strict for those contravening the existing laws. There should be strict penalties against anybody contravening the road traffic rules. A national statutory body for prevention of road traffic accidents should be established. Reliable and sustainable injury surveillance data should be collected including secondary data routinely collected from hospital and police records, which comprises an important foundation for monitoring and evaluating road safety strategies in Tanzania.

Regarding research objective six, the prevalence of helmet use by motorcycle drivers is influenced by the presence of legislation and enforcement. Currently, in Tanzania, legislation for helmet use applies on only in all national roads; there is now an urgent need for the government to enforce on helmet use by all motorcyclists and passengers

5.4 Areas for further Research

1. This study did not involve countermeasures to reduce commercial motorcycle accidents. There is a need to conduct research about countermeasures for minimization or complete eradicate commercial motorcycle accidents in Tanzania.
2. It is recommended that more studies be conducted to supplement the findings of this study in the Government Institution.

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APPENDICES: Research instruments

Appendix A: QUESTIONNAIRE FOR MOTORCYCLISTS

Dear Respondent

Thanks very much for you for accepting to complete this Questionnaire and prevailing yourself for structured discussion. This questionnaire serves as a data collection Instruments that will help Researcher to organize data in the study. In order to identify FACTORS CAUSING MOTORCYCLISTS ACCIDENTS CASE STUDY IN MOROGORO MUNICIPALITY, Researcher is looking for information that will assist to provide reliable information to stake holders and shareholders in commercial motorcycle as well as partial fulfillment of the Award of Masters of Business Administration Corporate Management.

Dear respondent note that any information will treated as confidential between Researchers and Respondent. And this questionnaire is for academic purpose.

PART 1. DEMOGRAPHIC FACTORS OF MOTORCYCLISTS

1. **Age**

   15 – 20 ( )

   21 – 26 ( )

   27 – 32 ( )

   33 – 40 ( )

   41 – above ( )

2. **Sex**

   Male ☐ **Female** ☐

3. **Education level**

   i. No formal education ☐

   ii. Primary Education ☐

   iii. Secondary Education ☐

   iv. Graduate ☐

4. **Experience in riding motorcycle**

i. Less than 3 months [ ]

ii. 3 months to 6 months [ ]

iii. 7 months to 1 year [ ]

iv. 1 year to 1.5 years [ ]

v. 1.5 years to 5 years [ ]

vi. 6 years and above [ ]

PART 2: CAUSES OF COMMERCIAL MOTORCYCLIST ACCIDENTS

Which of the following factors is the major cause of accidents? Please arrange according to the preferences through numbering:

i. Speeding [ ]

ii. Alcohol drinking and driving [ ]

iii. Lack of detection [ ]

iv. Rider fatigue [ ]

v. Lack of training [ ]

vi. Non observance of traffic laws [ ]

vii. Receiving calls while driving [ ]

viii. Wrong overtaking [ ]

ix. Bad road [ ]

x. Reckless driving [ ]

xi. Other causes [ ]

PART 3: COMMERCIAL MOTORCYCLISTS FORMAL TRAINING

3.1 Were you trained on how to cycle?

Yes ☐ No ☐

3.2 If YES who trained you to cycle?

i. Friend ☐

ii. Myself ☐

iii. Traffic ☐

iv, Institution ☐

4.8 For how long were you trained? ----------

4.9 Does the motorcycle training program have assisted you to drive motorcycle safely?

Yes ☐ No ☐

PART 4: MOTORCYCLISTS AWARENESS OF CYCLING REGULATIONS

4.1 Are you aware of the cycling regulations?

Yes ☐ No ☐

4.2 Are you aware that you are required to abide the following cycling regulations?

i. Road license Yes ☐ No ☐

ii. Driving license Yes ☐ No ☐

iii. Wearing of helmets Yes ☐ No ☐

iv. Do you wear protective clothing when you ride?

(eg., jacket, gloves, and boots? Yes ☐ No ☐

v. Are you aware that you are required to wear a helmet when you are riding a motorcycle? Yes ☐ No ☐

vi. Have you heard about Road Traffic Act? Yes ☐ No ☐

vii. Are you aware of the existing Traffic Signs when riding your motorcycl ☐ ☐
Yes No

viii. Are you aware on the existence of signs for Pedestrian crossing?
Yes ☐ No ☐

ix. In Morogoro Municipality there is a 'One way traffic Road'. Are you aware on the existence of these ☐ ☐
No

4.3 Do you wear a Helmet when you are riding?

i. Always [ ]
ii. Nearly always [ ]
iii. Sometimes [ ]
iv. Seldom [ ]
v. Never [ ]

4.4 Have you already been in a motorcycle accident before?

Yes ☐ No ☐

PART 5. MOTORCYCLISTS ATTITUDE ON WEARING HELMETS

Please indicate the level of your agreement on the attitude towards wearing helmets.

STATEMENT	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Wearing Helmet is very important					
Wearing helmet useful					
Helmet reduces head injuries					
Wearing helmet is one of the safety measure					
Campaigns for helmet wearing is not necessary					
Non helmeted riders do not suffer severe head injury than helmed riders					

There is a need for creation of mandatory helmet wearing law					

PART 6: STRUCTURAL FACTORS CAUSING MOTORCYCLE ACCIDENTS

Please indicate the level of your agreement on the structural factors causing accidents

STATEMENT	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
The road is often overlooked as a motorcycle hazard					
Familiarity with roadway is not important					
Slippery road during rain causes accidents					
Road bumps are good designed and not dangerous					
Road improvement reduces motorcycle accidents					
Retained water surface during rain do not cause accidents					

Road surface defects cannot cause commercial motorcycle accidents					

APPENDIX B:

INTERVIEW GUIDE ON CHALLENGES FACED BY TRAFFIC POLICE IN PREVENTING COMMERCIAL MOTORCYCLE ACCIDENTS

1. What challenges do you face in preventing accidents?
2. Do you train Commercial motorcyclists on how to prevent motorcyclist's accidents?
3. How many motorcyclists' accidents reported from the year of 2010 to 2014?
4. What's the greatest threat to motorcyclists that you see on our roads?
5. What are the main causes of commercial motorcycle accidents in Morogoro Municipality?

APPENDIX C:

INTERVIEW GUIDE ON CHALLENGES FACED BY SUMATRA IN PREVENTING COMMERCIAL MOTORCYCLE ACCIDENTS

1. What is the role of Sumatra in preventing motorcyclist's accidents in Morogoro Municipality?
2. Does the Commercial motorcycles require motorcycle license from SUMATRA?
3. The Inspection Report issued by SUMATRA is important to commercial motorcyclists?
4. Does the Certificate of Authorization issued by SUMATRA is applicable to commercial motorcycle?


HONDA
POLICE