AN INVESTIGATION OF ROAD ACCIDENTS CASUALITY IN DAR ES SALAAM: A CASE OF REPORTED MOTOR VEHICLE ACCIDENTS IN 2018

LEYLA A. MCHAWE

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation entitled: **An Investigation of Road Accidents Casuality in Dar es Salaam: A Case of Reported Motor Vehicle Accidents in 2018**" in partial fulfilment of the requirements for the degree of Master in Business Administration in Transport and Logistics at Open University of Tanzania

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Dr. Salum Mohamed

(Supervisor)

……..

Date

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DECLARATION

I, **Leyla A. Mchawe,** do hereby 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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Signature

……..

Date

DEDICATION

I dedicate this work to my mother Ms. Togo Magomba for her authoritative parenting and for laying the cornerstone of my intellectual abilities.

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Fore mostly, thanks go to the almighty God whom without his grace and blessings this study would be quite impossible. I would like to acknowledge the assistance given to me by supervisor Dr. Salum Mohamed who made constructive critics/ advice, challenges and guided me to the right track of writing this research work. His valuable supervision and ideas enabled me to accomplish this study, and hence achieve my goal. He readily and willingly accepted to give me ideas wherever I consulted him. Mighty our living God bless you and your family. My particular appreciations go to my mother, Ms. Togo Magomba and my father Mr. Abdallah Mchawe and my brother and sister whose presence I will always cherish. My particular thanks go to all the lecturers and colleagues who provided me with a conclusive to continue climbing up the intellectual ladders. Since it is difficult to acknowledge everybody individually, I extend my special appreciation to whoever contributed to the accomplishment of this study. Inexpressible thanks go to the Open University of Tanzania, may God bless you.

ABSTRACT

Increase in rate of accidents is considered to be among the factors that lead to increase in number of death rate and disability to the people having seen that; the researcher was more interested in assessing the road accidents causality in Dar es Salaam. Specifically, the study aimed at determining the extent to which human factors, climate factors, mechanical errors and the measures that can be used to reduce road accidents causality in Dar es Salaam. Case study research design methodology was used where two sampling techniques were used in the study, which were purposive and simple sampling procedure. 30 traffic police were selected from the purposive sampling while 30 Pedestrians and 20 drivers were randomly selected and 5 Key informants were interviewed from the SUMATRA. Also, the study used both primary and secondary data collection. From the findings it was observed that human factors such as drinking alcohol habits, irresponsible behaviour, wrong overtaking, failure to follow road signs tiredness/sleeping, mobile phone usage while driving, lack of driving knowledge excessive speeding inadequate visibility and non-use of seat belts. Climatic condition is also among the factors, which lead to road traffic accidents due to heavy rainfall, travelling in darkness, hot environmental condition and strong wind. Finally, the study reported on the measures to be taken which was development of comprehensive road safety program, link between the driving schools and the police stations, continuous driving training, health status, low enforcement. The study concludes that road accidents in Dar es Salaam can only be reduced if people are well educated on the proper ways of using the roads and lastly it was recommended that the government should consider road safety as the political priority by insisting people on the proper ways of using the roads as well as the health centres should be responsible in giving awareness on the health losses.

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LIST OF ABBREVIATIONS

NGO	Non-Governmental Organization
NHTSA	National Highway Traffic Safety Administration
RTAs	Road Traffic Accidents
SUMATRA	Surface and Marine Transport Regulatory Authority
TPF	Tanzania Police Force
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

World Health Organisation (2013) asserts that approximately 1.24 million people die every year on the world's roads, and another 20 to 50 million sustain nonfatal injuries as a result of road traffic crashes. These injuries and deaths have an immeasurable impact on the families affected, whose lives are often changed irrevocably by these tragedies. They also affect communities in which these people live and work. Road traffic injuries are estimated to be the eighth leading cause of death globally, with an impact similar to that caused by many communicable diseases, such as malaria (World Health Organisation, 2013).

The Global Burden of Disease Study estimates that 10% of global deaths are due to injuries, and that if current trends persist, this burden will greatly increase in the next 20 years. It is generally acknowledged that this problem is growing rapidly in Sub-Saharan Africa, and it is projected that by the year 2020, injuries in Africa will rank third among causes of disability. Road traffic crashes account for much of the injury burden worldwide, especially in low and middle - income countries and are currently ranked 9th globally among the leading causes of disease burden, in terms of disability adjusted life years (DALYs) lost. By 2030, road traffic crashes are anticipated to rank in the top 3 of all cause disabilities behind depressive disorders and ischemic heart disease. Accelerated urbanization and industrialization in many countries have led to an alarming increase in the rate of road traffic crashes.

When come to Ethiopia, according to the latest WHO data published in April 2011- road traffic accident deaths reached 22,786 or 2.77 percent of total deaths. The age adjusted death rate is 37.83 per 100,000 of population ranks Ethiopia number 12 in the world. Road traffic accidents are becoming a major public safety and development obstacle. Pundits said that the current situation necessitates high level of political dedication and immediate action. Various studies have indicated that Ethiopia has one of the highest fatality rates per vehicle in the world. It is in excess of 100 fatalities per 10,000 vehicles. This should be compared with Kenya and United Kingdom, where the figure is about 19 and 2 per 10,000 vehicles respectively. Ethiopia loses about $65million annually due to traffic accidents. In addition, the victims are mainly public transport travellers in the working age group (18 to 30 years) (Zegabi, 2014).

(Amoi-Séminet,2013) is of the view that in 2010 there was very high and increasing burden of road traffic crashes around the world. The United Nations General Assembly adopted Resolution 64/255, which proclaimed 2011–2020 the Decade of Action for Road Safety. The goal of the decade was to reduce the increasing trend in road traffic deaths, and to save an estimated 5 million lives over the period. In line with UN Resolution 64/255 the Tanzania Police Force adopted objectives which could help to decrease traffic crashes and make the streets safer through the following strategies: locating and identifying the main locations and causes of crashes; continuing to build support for neighbourhood speed watch; utilisation of directed patrols and highly visible traffic enforcement endeavours; increasing Tanzania Police Force (TPF) participation in the traffic-related task forces at national and regional levels; and creating public awareness. These could be achieved, among others, through roadside inspections; and mandatory car inspections.

Road transport in Tanzania account for about 70% and it is the dominant means of transport of goods and passengers. However as important as it is the system has always been accompanied by a good deal of catastrophe emanating from tragic road accidents, which have been increasing year after another.

Due to growth and expansion of the economy, improvement of road infrastructure and increased incomes, there have been significant increases in transportation equipment. This increase has not been in line with road safety literacy and training among those road users and others (example pedal cyclists, pushcart operators and pedestrians). There has been a lot of non-compliance with traffic rules and regulations by drivers and pedestrians. The data from Tanzania Traffic Headquarters show that there were 23,578 total accidents whereby death toll counted 3,969 and injuries were 20,111 in 2015 compare to 23,986 total accidents with 3981 death toll and 20,802 injuries in 2016 (Tanzania Traffic Police, 2018). This means that the prevention of road accident has not been dealt with effective measures as the number of road accidents, death and injuries decrease slowly.

Also, according to the Crime and Traffic Incidents Statistics Report Jan-Dec_2017, the minor traffic offences were by far the largest and constituted 99.3 percent of all road traffic incidents. Also, the report stipulates the reasons for the minor incidents include wrong parking, unfastened seat belt, over speeding, usage of mobile phone while driving, passing traffic red light, wrong turn in prohibited crossing, driving without a license and others. Following these incidents, a total number of 1,249,642 of whom males were 1,249,622 and females were 20. Those offences caused the death of 3,574 people, out of that 2,845 were male and 729 were female and injuries were

9,993 out of that 7,400 were male and 2,593 were female. In terms of road safety incidents, a total of 1,390,482 offences were reported in 2018 compared to 1,125,672 in 2017. This is an increase of 264,810 offences, which is equivalent to 23.5 percent. In 2018 at national level, the number of major traffic offences reported were 8,777 which caused 3,574 deaths and injuries to 9,993 persons. In Tanzania Mainland, regions reporting large numbers of traffic offences are Kinondoni (172,009), Ilala (122,344), Arusha (112,461), Temeke (107,010) and Morogoro (86,502) while Katavi has smallest number of 7,582 offences. In Tanzania Zanzibar, the region with the largest number of traffic offences is Mjini Magharibi (6,764) and regions with few offences are Kaskazini Pemba (1,299), Kusini Unguja (2,681).

Chiduo and Phelemon (n.d) argue that road accidents in Tanzania are caused by various reasons including drivers' errors, pedestrian error, cyclist error and drinks/fatigue. Others are road weather, mechanical faults, overloading and failure of road safety management. Thus, the study wanted to understand the extent of road accidents causality in Dar es Salaam. The result of this study will help in developing control measures against this problem.

1.2 Statement of the Research Problem

There are different modes of transport such as air, water and land transport. Land transport is the second cheapest (after water) mode of transport. Road transport, though it is preferred since it gives door to door service, it is the most vulnerable to traffic accident than any other mode of transport. Today, however, a certain blight or difficulty has settled in the world increasingly, people face difficulties when moving from place to place. Despite the important 2 positive role the sector, it also is

generating social, economic, political and environmental problems (Abrahalign, 2018).

Researches by an NGO, Amend.Org of 2017 have proved that 3.4 percent of Tanzanians die in road accidents in a year, 75 percent of those stems from reckless driving. Most of the accidents caused by human factors were due to careless motorcyclists' 24.1 percent and careless drivers caused 21.9 percent of the accidents.

Other human factors caused 38.4 percent of the accidents. Injuries represent a significant cause of morbidity and mortality worldwide and road traffic crashes accounts for a significant proportion of these injuries. Tanzania is among the countries with high rates of road traffic crashes. Also, road traffic crashes account for much of the injury burden in Tanzania while the majority of the injured victims are in the economically active age group of 18 - 45 years. Motorcycles are responsible for the majority of road traffic crashes. Respicious (2017) did a study with the aim of determining the pattern, associated factors and management of road traffic injury patients in Tanzania.

A study was a cross-sectional study of patients involved in motor traffic crashes and attended in six public hospitals of Tanzania mainland between April 2017 and September 2017. The study results showed that a total of 4675 road traffic injury patients were seen in studied hospitals, 76.6% were males. Majority (70.2%) were between 18 - 45 years age group. Motorcycles were the leading cause of road traffic crashes (53.4%), and drivers (38.3%) accounted for majority of victims. Fractures accounted for 34.1%, and injuries were severe in 2.2% as determined by the Kampala

trauma score II (KTS II). Majorities 57.4% were admitted and 2.2% died at the casualty.

Data obtained from police revealed 5869 road traffic crashes in six months April to September 2018, in three regions studied with 515 fatalities (died at the site of crash). Rates per 100,000 populations revealed Dar es Salaam to be leading in road traffic crashes and casualties, while fatalities were more in Coast region. Reasons for road traffic crashes as stated by police were reckless/dangerous driving 40.6%, careless motorcyclists 26.4%, bad roads 17.9%, defective motor vehicles 6.9% and others (like careless cart pushers, animals crossing the roads) 8.2%. And this is why the study wanted to assess the extent of road accidents causality in Dar es Salaam.

1.3 Objectives of the Study

1.3.1 General Objective

The purpose of this study was to assess the road accidents causality in Dar es Salaam.

1.3.2 The Specific Objectives

(i) To determine the extent to which human factors have caused road traffic accidents in Dar es salaam

(ii) To determine the extent to which climate factors have caused road traffic accidents in Dar es Salaam

(iii) To assess the extent to which mechanical errors have caused road traffic accidents in Dar es Salaam

(iv) To suggest measures that can be used to reduce the road accidents causality in Dar es Salaam.

1.4 Research Questions

1.4.1 General Research Question

The general question of this study is; what are the causes of the road accidents causality in Dar es Salaam?

1.4.2 Specific Research Questions

(i) To what extent the human factors have caused road traffic accidents in Dar es Salaam?

(ii) To what extent the climate factors have caused road traffic accidents in Dar es Salaam?

(iii) To what extent has the mechanical errors cause road traffic accidents in Dar es Salaam?

(iv) What are the measures that can be used to reduce road traffic accidents in Dar es Salaam?

1.5 The Scope of the Study

The study was limited to one of the major cities of Tanzania, Dar es Salaam which has a record of high causality rank in the country. Among different factors of accident, such as drivers' factor, pedestrians' factor, mechanical factor of vehicles, road environment, and congestion of small passenger vehicles (Bajaj), Commercial vehicles the most vulnerable and bicycles. The study focused on the major extend of the causes of road accidents, human, climate and mechanical errors factors to the city and the country in all.

1.6 Significance of the Study

(i) This study explored the magnitude and the extent to which road accidents affects the life of people, economy and country state in general. This will help the government to take responsive measures.

(ii) The study will create a foundation for further studies on the extent of road accidents in Dar es Salaam and help the policy makers to develop appropriate solution to the problem. Also, the study will help the researcher to fulfil the partial requirement for being awarded the Master of Business Administration.

1.7 Organization of the dissertation

This dissertation is organized into five chapters. The first chapter is an introduction which comprises background information, statement of the problem, objectives of the research, research questions, and scope of the study, significance of the study and limitations of the study. The second chapter reviews both theoretical framework and empirical literature in extent of road accident causalities. This chapter also presents research gaps and describes a conceptual framework. The third chapter selects and discusses the methodology of the study. Chapter four of this dissertation presents research results and discussion on the research objectives of the study as reflected on the research questions. Chapter five presents the summary of the study, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents conceptual definitions of terms used in the study, theories and theoretical analysis, empirical analysis of literature, research gap, conceptual; framework of the study and summary.

2.2 Conceptual Definitions

This sub-section contains the list and definitions of terminologies used in various chapters of the study. The intention is to make sure every terminology is clear and defined according to the context of the study. Such terminologies include:

2.2.1 Road Traffic Accidents

Kandiya, (2018) defined Road Traffic Accident is any vehicle accident occurring in a public highway. It includes collision between vehicles and animals, vehicles and pedestrians or vehicles and stuck obstacles. Single vehicle accidents that involve a single vehicle, which means without another road user, are also enclosed (Safe carguide, 2017).

In a similar manner Ajit and Ripunjoy (2018), have mentioned that an accident is an occasion, occurring abruptly, unpredictably and inadvertently under unforeseen 9 circumstances. Seemingly, Segni, (2017) have also outlined that an accident is a rare, random, multi-factor event always preceded by a situation in which one or more road users have failed to cope with the road environment.

However, the study adapted the definition by World Health Organization's (WHO) World Report on Road Traffic Injury Prevention (2004) and defined it as a road traffic injury as fatal or nonfatal injuries incurred as a result of a road traffic crash.

2.2.2 Theoretical Review

2.2.3 Accident Causation Theory

Accidents causation theory is based on, man and machine relationship, frequency and severity relation, unsafe acts reasons, management role in accident prevention, costs of accidents and the impact of safety on efficiency (Heinrich, 1959) as cited in Philip, et al, (2001). Heinrich (1959) as cited in Abdelhamid and Everett (2000) deduced that 88 percent of accidents are due to unsafe act of workers, 10 percent due to unsafe conditions and 2 percent of all accidents are associated with the act of God such as natural disasters. Taylor *et al* (2004) explained the 'Domino theory' based on five sequential factors. The factors include: ancestry and social environment. Ancestry and social environment is a process of acquiring knowledge of customs and skills in the workplace; lack of skills and knowledge of performing tasks, inappropriate social and environmental conditions which lead to fault of person; the fault of a person or carelessness is negative features of a person's personality although these unwanted characteristics might be acquired; the result of carelessness is unsafe act/conditions.

Unsafe act and/or mechanical or physical condition include the errors and technical failures which cause the accidents and ultimately injury; and injuries are the consequences of the accidents. This theory helped the researcher in understanding the human factors which cause the road traffic accidents in Dar es Salaam.

2.2.4 Human Factor

There are varieties of theories concerning the causes and effects of road traffic accidents one among them is account for human error. The theory was introduced by Murell, (1965), it was later on extended by Van Elslande. The theory analyses human error in the field of accident causation analysis such as pressure, fatigue, motivational, drugs, alcohol and worry. The aim of the theory is to contribute to a deeper comprehension of the complexity of the human aspects involved in driving activity by promoting human cantered methodological tools. It analyses all the disciplines of psychology that are relevant for driving behaviour such as human perception, attention, cognition, personality and social. It is noted that human error is a problem of great concern within complex sociotechnical systems, being consistently implicated in a high proportional of accident and incidents Salmon (2015). Recently, research within the road transport domain indicates that human 11 errors contribute to as much as 75% of all roadway crashes.

The literature review conducted by Salmon, Regan, and Johnston, (2015) indicated that the key aspects of error management within complex sociotechnical systems include the recognition of the fallible nature of humans and the inevitability of error occurrence and the enhancement of error tolerance throughout the system. Rather than attempt solely to enhance system safety through the eradication of errors, system should also be made safer by increasing their tolerance of error. However, they concluded that despite road safety professional's best efforts, safety interventions, strategies, new technologies and countermeasures will never completely eradicate road user's error. Drivers, pedestrian and other road users will continue to make error for as long as the road system exists. It was therefore, concluded that rather than

focusing entirely upon removing road users' error through training, awareness campaigns and enhanced technology, effective error management in road transport should as a complementary aim, focus on increasing capacity of the road transport system to tolerate error.

Therefore, it can be summarized as follows human factors in road accidents include all factors related to drivers and other road users that may contribute to a collision. Examples include driver behaviour, visual and auditory acuity, decision-making ability, and reaction speed. The feeling of being confident in more and more challenging situations is experienced as evidence of driving ability, and that 'proven' ability reinforces the feelings of confidence. Confidence feeds itself and grows unchecked until something happens near-miss or an accident. This theory helped the researcher in understanding the main causes of road traffic accidents causality Dar es salaam but also helps to understand psychologically the implications of the problem which will in turn help to figure out the extend of human factor errors in causing road accidents.

2.2.5 The Systems Theory on Accident Causation

Another theory on Road traffic accident is system theory; Salmon et al, (2019) are among researcher used this theory in the context of road safety to conceptualize the causes of road traffic accident. Considerable evidence for a systems approach to safety has been gathered in most safety critical domains. Such an approach is based on the notion that human performance is a function of many interacting system-wide factors. According to this theory safety is no longer solely the responsibility of front-line operators; rather, the responsibility is shared between actors across all levels of the

complex sociotechnical system (e.g. Regulators, policy makers, designers, line managers, manufacturers, supervisors, and front-line operators). In the context of human error and accident causation, for example, it is now accepted that errors are a consequence of 'systems' failure, rather than merely aberrant psychological factors within individuals; human error is thus no longer always seen as the primary cause of accidents, rather it is treated as a consequence of latent failures residing within the wider system (e.g. Reason, 1990).

In a road safety context, elements of the system beyond road users, such as vehicle design and condition, road design and condition, road policies, and so on, all shape driver behaviour on the road. Across the safety critical domains, various models of accident causation exist (e.g. Leveson, 2004; O'Hare, 2000; Rasmussen, 1997; Reason, 1990). The most prominent of these are systems-based models (e.g. Reason, 1990), and it is now widely accepted that the accidents which occur in complex sociotechnical systems are caused by a range of interacting human and systemic failures.

Undoubtedly the 13 most popular and widely applied models are Reason's (1990) systems perspective model of human error and accident causation. It is noted that most accident analysis methodologies are underpinned by systems thinking of the like displayed in Reason's Swiss cheese model. The model is highly applicable in a road transport context, with each of the levels specified applicable to road transport systems, and yet it does not appear to have been widely accepted or applied in such a fashion.

This theory was used in understanding the extent of other factors in causing road accidents such as climate factors and mechanical error factors.

2.3 Empirical Reviews

There are a number of researches, surveys and studies conducted by others researches relating to this topic. The studies have been conducted in varied dimensions and also across various sectors of learning. This section provided a general review of the empirical evidence regarding the assessment of road accidents causality.

2.3.1 Empirical Literature Review Worldwide

Hammad *et al* (2012) conducted a study on investigating stress and employee performance in Traffic Police in Malaysia. The results indicate that the presence of stress among the traffic wardens have a positive effect on their performance. When coping mechanisms acting as moderator is introduced the effects of stress reduces considerably. Thus, coping mechanisms reduce stress considerably and are in-line with the results of previous studies. Traffic Police department is a high pressured and stressful department to work in.

Employees are constantly under pressure to perform in the face of adverse conditions like political pressure, public pressure and performance-oriented management system. In these circumstances, the support of top management becomes essential. This may come in the form of providing better working conditions as well as giving work related autonomy so that these officers can perform at their best and take decisions as and when required. However, this study was about effectiveness of Traffic Police in preventing road accidents.

According to the study by Shankar et al (1995), rainfall plays a significant role in road traffic accidents. They argued that higher rates of fatalities resulting from road traffic crashes in poor weather could be explained by (a) poor visibility due to rainy or snowy weather (b) the road surface which may be more slippery thereby reducing the vehicle-roadway friction. Also, previous study by Hijar et al (2000) in Mexico tended to support the findings of the study of Shankar et al (1995). Hijar et al (2000) showed a definite association of adverse environmental conditions such as rain, fog, and wet pavement as well as driving in daylight with traffic crashes. However, Kashani et al (2012) revealed that weather and road surface conditions, shoulder type and road width, lighting as well as location type are less important variables, influencing the injury severity by traffic crashes than the use of seat belt, cause of crash and collision type.

Anna (2010), investigated the distribution of slippery roads in Sweden and the UK for the present climate and how this may be affected by climate change for the rest of the century. The purpose of the thesis was to get a better understanding of winter road conditions and relationships to motor vehicle accidents. The study found that Climate change scenarios show that the number of days with temperatures below zero degrees will gradually decrease over the next century. By the 2080s (2070-2100), there will be a 22% reduction of the number of days in the Gothenburg area (Sweden) and a 48% reduction in the Birmingham area (UK). By using derived statistical relationships with traffic accidents, this translates to a theoretical reduction in the number of accidents occurring when the temperature is below zero degrees by 20% respectively 43%. Winter maintenance costs are likely to be reduced by at least 15% in the Gothenburg area until the 2080s. This can be compared with a decline of 38% per annum in the

Birmingham area. The study concluded that there may be a disadvantage with a warming climate at least when considering accidents. Since the temperature is rising the number of days with temperatures above zero degrees increases quite rapidly until 2080s. If the ratio between accidents and number of days at each degree will remain unchanged there will be an increase in the number of traffic accidents with as much as 88% at temperatures above zero degrees. Despite this great increase, the total amount of accidents will only increase by 2%.

Lankarani et al (2014) in a study in Iran revealed that environmental factors are major causes of road accidents. It was established that dusty weather had the highest death rate compared to other weather conditions. The study found that winding uphill/downhill road was the roadway geometry with the highest rate of RTAs. This roadway geometry limits the driver's vision and causes difficult control of vehicle at crash time with subsequent increase in fatal RTAs risk.

2.3.2 Empirical Literature Review in Africa

Jeremy et al (2017), investigated the effects of environmental factors on road safety in Nairobi with the main objective of assessing the effect of environmental factors on road traffic accidents (RTAs). The study used two (2) hypotheses which were formulated and tested using collected data. They were (a) ‘there is no significant difference between wetness of the road and the number of RTAs’, (b) ‘there is no significant difference between pedestrian RTAs and lack of road signs and pedestrian crossings points. Researcher used quantitative research and data was collected using questionnaires administered to randomly selected drivers and traffic police officers. On the result analysis, hypotheses were tested using chi-square test. The study found

that road conditions did not contribute significantly to RTAs, lack of adequate pedestrian road crossing facilities and fences at black spots led to traffic crashes, pedestrians tend to ignore designated pedestrian traffic ways and safe road crossing points thereby being involved in RTAs, absence of speed limit signs and speed limit bumps at black spots increases the occurrences of RTAs. The study recommended that road safety should be recognized as a national disaster and adequate funds allocated to deal with it. Also, there should be enforcement of traffic rules.

All the same, WHO (2004) studied about causes and effects of road accidents in developing countries. The study used longitudinal study over four African countries. The study findings show that over 3000 Kenyans are killed on our roads every year, most of them between the ages of 15 and 44 years. The study continues to note that the cost to economy from these accidents is in excess of US$ 50 million exclusive of the actual loss of life. In fact, the WHO was also iterated to investigate the social and economic impact emanated from the said road crashes. It is noted that Kenyan 16 government appreciates that road traffic injuries are a major public health problem amenable to prevention.

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

Ohakwe (2011) conducted a study with the aim of examining the factors contributing to road traffic accidents in Abuja. The study wanted to address the puzzle, why despite of all efforts that have been implemented to prevent road traffic accidents in Nigeria, the incidence of accidents is increasing; the study employed both qualitative and quantitative methodology the research gap/puzzle was addressed. The researcher used SPSS in analysing data and the study found that the causes are human, technical, mechanical and political factors.

However, human factors were noted to be dominant factors influence's the occurrence of road traffic accidents i.e. alcoholism, carelessness, drugs, and over speed. Furthermore, the study noted the following impacts death, injuries, disabilities and psychological problem as well as poverty and the loss of property. Finally, the study recommends that, road safety measure needs to be taught as a subject in primary school. This is because large number of people ends with that level of education, strict enforcement of road laws, and road traffic injuries should be considered as a public health issue.

2.3.3 Empirical Literature Review in Tanzania

Christopher (2015) studied the factors causing commercial motorcycle accidents in Tanzania; the case study of Morogoro Municipality with the purpose of creating 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 interviewed for study from various locations within Morogoro Municipality. The same numbers of respondents were found valid for analysis. Data were analysed through Statistical Package for Social

Scientists using T-Test techniques. The findings of the 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.

The study 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.

Respicious (2017), the aim of this study was to determine the pattern, associated factors and management of road traffic injury patients in Tanzania. A study was a cross-sectional study of patients involved in motor traffic crashes and attended in six public hospitals of Tanzania mainland between April 2017 and September 2017. The study results show that a total of 4675 road traffic injury patients were seen in studied hospitals, 76.6% were males. Majority (70.2%) were between 18 - 45 years age group. Motorcycles were the leading cause of road traffic crashes (53.4%), and drivers (38.3%) accounted for majority of victims. Fractures accounted for 34.1%, and injuries were severe in 2.2% as determined by the Kampala trauma score II (KTS II). Majorities 57.4% were admitted and 2.2% died at the casualty. Factors associated with

mortality were; using police vehicles to hospital (P = 0.000), receiving medical attention within 2 to 10 hours after injury (P = 0.000), 18 - 45 years age group (P = 0.019), not using helmet (P = 0.007), severe injuries (P = 0.000) and sustaining multiple injury (P = 0.000). The study concluded that road traffic Injuries in Tanzania are an important public health problem, predominantly in adult males, mostly due to motorcycle crashes. It is therefore important to reinforce preventive measures and pre-hospital emergency service is urgently needed.

Elias (2014), did a study to assess the effectiveness of Traffic Police in preventing road accidents in Tanzania. The study used questionnaire as the main method of data collection and the sample size was 226 Traffic Police based in Dar es Salaam. The data was analysed descriptively using Statistical Package for Social Science (SPSS). The study found that Traffic Police were ineffective in preventing road accidents as they failed to create public awareness on road safety issues as well as conducting daily roadside inspections which made road users to relax and possibly cause road accidents. Furthermore, the study found that there was a shortage of road safety traffic equipment like cameras, road direction facilities as well as Traffic patrol vehicles that could assist Traffic Police in preventing road accidents. Moreover, the study found that Traffic Police had a lot of challenges including poor working conditions and inadequate salary package. The study recommends that in order for Traffic Police to be effective in preventing road accidents in Tanzania more efforts should be devoted to creating public awareness on road safety issues

Sospatro, et al (2013), conducted a study to determine the pattern of cases and deaths due to traffic road accidents in Mwanza City Tanzania. The study used retrospective,

records, registers and case notes in the surgical ward and causality, medical records and central police station from 2009 to 2012 were used. The study focused on the two referral hospitals (Sekouture regional hospital and Bugando Medical Center). The study used descriptive analysis to analyse data.

The study found that there were 3450 cases due to accidents reported at both centres (Sekouture regional hospital and Bugando Medical Center of which 3224 (93.4%) had complete information for analysis. 2225 (69%) were male and 999 (31%) were female, and the most affected group were male. Among the RTAs 2809 cases (87%) were due to motor cycle accidents which were the leading cause of RTAs with case fatality rate of 5% while motor vehicle has case fatality rate of 24% which is 5 times that of motor cycle. The study concluded that among all RTAs the leading cause of injuries is Motor cycle traffic accidents followed by motor vehicle. RTAs are on increase particularly the motor cycle traffic accidents and have claimed a good number of innocent people's lives however most of them are preventable, therefore driving course to be introduced to motor cycle drivers emphasize on the road posters signal, rules and regular check-ups of their motor cycles especially commercial motor cycle.

Ajuae (2015) examined the effects of road safety measures in reducing road traffic accidents in Dar es Salaam city. The study wanted to fill the gap that why despite of all efforts made by the government in establishing and implementing road safety measure, still the problem of road traffic accidents is increasing? The study applied exploratory research design which has helped in understanding the nature of problem. In particular, qualitative and quantitative research methodologies and methods were

also employed by the study, in gathering and analysing required information's related to the topic under study. The findings of the study revealed that another immediate cause of a road accident may also be attributable to mechanical factor and carelessness in the form of omission to check and maintain the vehicle at the appropriate time. Road traffic accident is therefore an unexpected phenomenon that occurs as a result of the operation of vehicles, including bicycles and handcarts on the public highways and 39 roads. The study concluded that poor maintenance of vehicles also contributes to the occurrence of road traffic accidents.

Museru (2012), conducted a study with the aim providing information on the type of intervention necessary for various stages and will also show the true burden of injury in Tanzania. The study used data sources from police records, medical records, research reports, articles, statistics, abstracts and national newspapers. The study found that drivers' inappropriate behaviours defined by police as reckless or dangerous driving contributed nearly 52% of the different reasons cited as contributory causes.

2.4 Research Gap

From a critical literature review made, the researcher identified a gap that needs to be addressed which in this study the task was accomplished, for example the study done by (Pharles, 2015) who studied the factors contributing to road traffic accidents in Dar es Salaam specifically Temeke district found that human factors was noted to be dominant factors influence's the occurrence of road traffic accidents i.e. alcoholism, carelessness, drugs, and over speed. Furthermore, the study noted the following impacts death, injuries, disabilities and psychological problem as well as poverty and

the loss of property, in line with that (Christopher, 2015) found that 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, with this there is an inadequate study, that has researched the extent of the road accidents causality in Tanzania, specifically to what extent has human, climate and environmental factors has increased the problem. Thus, by identifying the extent of the problem, it will ease the process of coming up with different measures and laws to reduce the problem.

2.5 Conceptual Frameork

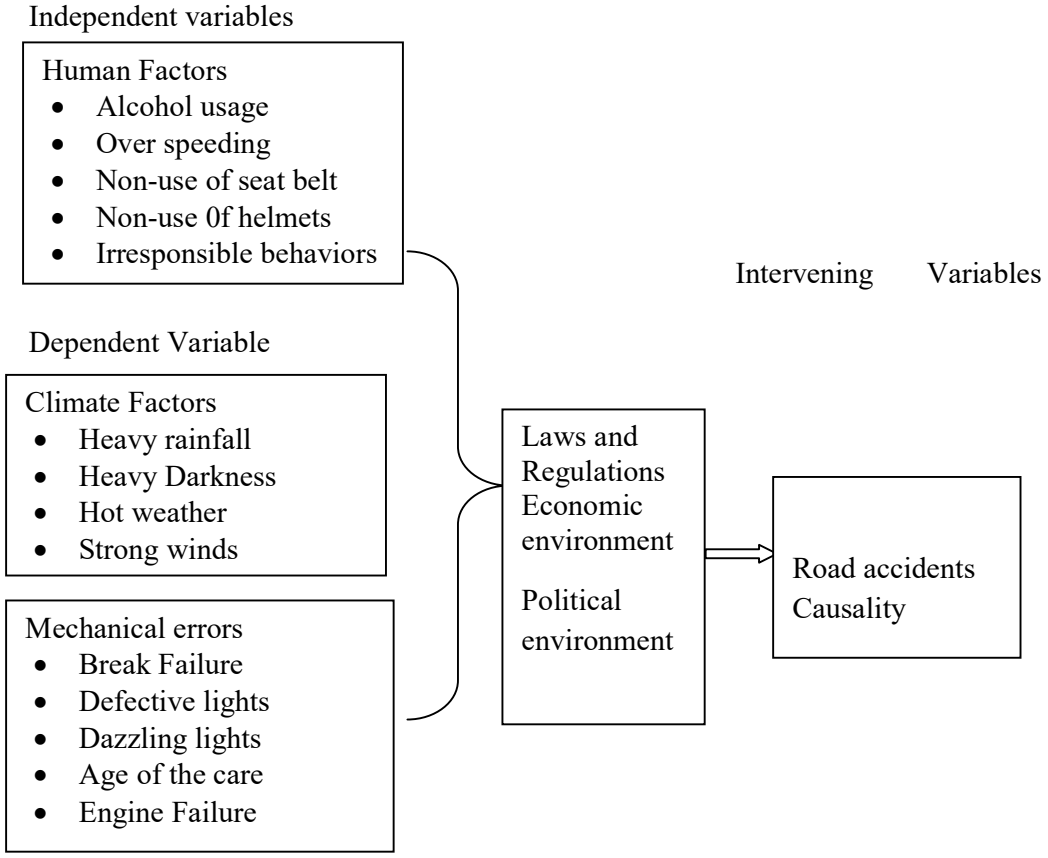

Figure 2.1: Conceptual Framework on the Assessment of Road Accidents Causality in Dar es Salaam

Source: Researcher

2.6 Theoretical Framework

A variable is a characteristic that can assume two or more properties. If a property can change either in quantity or quality, then it can be regarded as a variable (Kenneth, 2005). In the study there were three variables; independent variables, dependent variables and intervening variables.

An independent variable is the variable researcher has control over, that is, what the researcher can choose and manipulate. It is usually what researcher thinks will affect the dependent variable (Patton, 1990). In the study independent variables involved was:

Literature shows that most road accidents have several causes; the main ones being human error, environmental (climate) problems and mechanical faults. Human error it can take many forms: Alcohol: Alcohol can have a devastating effect on driving ability. It is the biggest single factor in road deaths, especially among young people. It adversely affects decision making, self-criticism, balance, co-ordination, sight, touch, hearing and judgments. Inexperience: With young people particularly, this can lead to mistakes, errors of judgments and irresponsible behavior, especially driving too fast.

Tiredness/illness: This reduces a road user's ability to cope with road conditions and situations. Other reasons include: Impatience, stress, carelessness, negligence, absentmindedness, irresponsible behaviour, inadequate knowledge and training, ageing, drugs and medicines, a general disregard for personal health and safety. Climate problems (weather conditions, road and junction design, and road surfaces); weather: rain can reduce visibility and make it harder to stop. Strong winds can be hazardous for cyclists. Road design: busy junctions, which are fine for cars may be

dangerous for other road users. Road surface: potholes, bumps and badly maintained roads can cause problems, especially for cyclists. If the road surface is wet and slippery it takes longer to stop when braking. Mechanical faults such as failure of the engine car, age of the car, Mechanical defect, Defective lights and Dazzling lights.

A dependent variable is what researcher measure in the study and what is affected during the study. The dependent variable responds to the independent variable. It is called dependent because it depends on independent variable (Patton, 1990). In the study researcher related what have been known to be independent/ exploratory variables with the extent of road traffic accidents causalities. Therefore, dependent variable was road accidents causalities.

An intervening variable is a hypothetical internal state that is used to explain relationships between observed variables, such as independent and dependent variables in empirical research (Kenneth, 2005). They facilitate a better understanding of the relationship between the independent and dependent variables when the variables appear to not have a definite connection. In this study the intervening variables was the laws and regulations, economic stability and political Instability. In the study the said variables above was used as intervening factors since it was necessary to make sure that potentially moderating effect of these factors were minimized.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Kothari (2004) defines research methodology as the way to systematically solve research problem. It may be understood as a science of studying how research is done scientifically. This chapter contains detailed information on methodological approach to this study. The chapter contains details of the research design, study area on which the study was conducted and the reason for selection, study population, sampling (sampling procedures, sample size and instrument), the method of data collection and how data was analyzed.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2004). A research design can be thought as the structure of research. It is the glue that holds all of the elements in a research project together (Kombo and Tromp, 2006). Due to the nature of the study that aimed to investigate the extent of road traffic accident causality case study research design was adopted. This type of research design was selected because; it helped in securing wealth of information about the unit of study, which may provide clues and ideas for further research (Krishnaswami, 2003). This design also was selected because it employs variety of techniques in data collection, such as historical method, descriptive method where a factual picture is needed, interviewing and questionnaires, which were also used in this study.

3.3 Area of the Study

The study was conducted in four municipals of Dar es Salaam City namely, Ubungo, Ilala, Kinondoni and Temeke. The area was selected purposely mainly due to three reasons. Firstly, in the recent years Dar es Salaam City has been observed to have a higher rate of road traffic accidents than any other region in the United Republic of Tanzania. Secondly, business-wise Dar es Salaam is the industrial and commercial city which means that it attracts large numbers of people from other places in the country and thirdly, the researcher lives in Dar es Salaam City.

Dar es Salaam City is located between latitudes 6.36 degrees and 7.0 degrees to the South of Equator and longitudes 39.0 and 33.33 to the East of Greenwich. It is bounded by the Indian Ocean on the East and by the Coast Region on the North, West and South. The City has 4.3 million people according to 2012 census.

Administratively, Dar es Salaam City comprised of five municipal councils which are Kinondoni, Ilala, Ubungo, Kigamboni and Temeke. The development of Dar es Salaam City is partly influenced by the arterial road network consisting of five main radial roads and one ring road all terminating in the Central Business District. The five radial roads are Kilwa Road, Nyerere Road, Morogoro Road, New Bagamoyo Road and Old Bagamoyo Road and the main ring road is the Mandela Road. The total length of roads based on 2005 data is about 1717 km out of which 395 or 23 per cent are paved, mostly arterial roads (JICA, 2008).

3.4 Target population

Population in research refers to individuals of more or less common characteristics that are of interest to a researcher (Creswell, 2003). The target population of the study

was total of 85 respondents, 30 traffic police, which included 5 heads of departments and 25 other officers that were working on roads for the last 3 months, also the study included 5 members of SUMATRA, 30 pedestrian and 20 drivers.

3.5 Sample Size and Sampling Techniques

3.6 Sample Size

Kothari, (2004) defines sample as a small group of respondents drawn from a population about which a researcher is interested in getting the information so as to arrive at a conclusion. The sample size of this study was 30 traffic police officers, the selected sample size was enough to represent the total population of Traffic police officers in their headquarters in Dar es Salaam, the chosen sample size was capable of bringing accurate information which a researcher was searching to find on the extent of road traffic accidents causality in Dar es salaam.5 members of SUMATRA, 20 drivers were randomly selected and 30 pedestrians in all three districts of the region.

3.6.1 Sampling Techniques

It is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics found in the entire group (Orodho and Kombo, 2002). Two sampling technique was used in this study, which are purposive and Simple sampling procedure. Purposive procedure is a sample element which allows judged to be typical representative and chosen from the population (Kothari, 2004). The chance that a particular case was selected for the sample depends on the subjective judgment of the researcher. From the study Purposive sampling was used to select30 traffic police. The sample respondents were purposively chosen because of the information that they possess. Simple random

Sampling as defines by Jamal and Kamuzora, (2008) refer to probability sampling whereby all members in the population have equal chance of being selected to form a sample. Simple random Sampling was used to select 30 Pedestrians and 20 drivers.

Table 3.1: Sample of Study

Areas/Authorities	**No. of Respondents**	**Data collection Tools**	**Sampling techniques**
Dar es Salaam Residents (Pedestrians)	30	Questionnaire	Random
Drivers	20	Questionnaire	Random
Traffic police	30	Questionnaire	Purposive
SUMATRA Representatives	5	Interview	Purposive
Total	**85**		

Source: Researcher

3.7 Method of Data collection

The study used two sources of data, i.e. primary and secondary data. Primary data means data directly collected from the area of study while secondary data means data from secondary sources like books, journals, reports and speeches. Mertens (1998) asserts that with regards to the nature of the study topic, types of data are usually distinguished between primary and secondary type of information.

3.7.1 Primary Data

Primary data are described as those items that are original to the problem under study (Cohen et al, 2000). This study accessed and generated primary data from the selected population in Dar es Salaam through interviews (face-to-face interviews) and questionnaires. Questionnaires were distributed to 80 respondents. Primary were necessary in order to get relevant, original and reliable first-hand information about the problem under study.

3.7.2 Secondary Data

These are accounts offered by the second part, those who did not actually see the object or event but obtained information and provided descriptions of what they taught (Mason and Bramble, 1997). They are usually seen as text that is produced much later than the events being studied, offering an interpretation and conversion of the primary data into an account that may be consulted by others (Mertens *et al*, 1998). This study collected and generated secondary data through documentary search like office records, circulars, administrative files, reports and minutes of meetings related to the research problem. The secondary data were used in the absence of, or to supplement primary data.

3.8 Data Collection Tools

To some extent, the kind of instrument used in data collection depends upon how the data was collected (Mason and Bramble *et al,* 1997). The study employed variety of methods to facilitate the cross-checking of the accuracy of information collected from the field. The study used more than one method aiming at obtaining adequate, original and relevant data about the study from variety of respondents. The methods used were:

3.8.1 Interview

Interviewing is basically about asking questions and receiving answers. It is a way of accessing people's perception, meaning and definitions of situations and construction of reality (Punch, 2005). Key informants interviewed 5members of SUMATRA. Through in-depth interviews, an interview guideline was structured and appointment for interview of key informants was conducted for those who were not present. The

interview method is quite flexible and can be easily adapted to a variety of situations (Mason and Bramble et al, 1997). This study employed unstructured and semi-structured interviews. Face-to-face interview was applied, also telephone interview was conducted.

3.8.2 Questionnaire

One set of structured questionnaires was prepared and administered to the targeted population. From the study 80 respondents were selected to fill the questionnaires, where structured questionnaire was adopted since it poses definite, concrete, and preordained questions that were prepared in advance (Rwegoshora, 2006). The questionnaire obtained information on employees turn over at Dar es Salaam prison service head quarter. The questionnaires were distributed to the targeted population who were selected randomly.

3.8.3 Documentary Review

In addition to interviews, data can be generated from documents and records which are non-human sources made available, often at low cost, and being factual (Cohen *et al*, 2000). Data obtained by this method enabled the researcher to cross-check the consistency of the data generated through interviews. Mason and Bramble (1997) add that document search especially in qualitative research; was used by the researcher in order to gain insights into the context and social processes underlying the events.

Documentary data was obtained from office records and documentation including minutes of the meetings, letters, reports and the administrative files and other related records. Other data were obtained from government records and documents such as circulars, directives, policies, Acts, and reports. Data from documentary search

complements and information generated through interviews. Books and journals were also used to shape the direction of the research.

3.9 Reliability and Validity of Data

3.9.1 Reliability

Reliability of research instruments refers to the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 1999; Mbwesa, 2006). The proposed research used Test-retest method. This method involves administering the same scale or measure to the same group of respondents at two separate times. This is after a certain time interval has elapsed. This means that the group is administered with the same test twice.

3.9.2 Validity

Validity of research instrument refers to the extent to which a test or an instrument measures what it was intended or supposed to measure (Mbwesa, 2006). Validity test aimed at ensuring that a scale logically appeared to reflect accurately what it was purported to measure. This ensures that the instrument is covering what it is intended to cover (Mbwesa 2006). The validity of this study was censured by the academic supervisors of this study. They read through the questions that were used in the study. The ones that were not correct was rephrased in order to measure what was intended to be measured. This helped the researcher to ensure that the content validity of the instruments was used. For that reason, this research study adopted content validity.

3.10 Methods of Data Analysis

The study generated both qualitative and quantitative data. Qualitative data which was collected through the interviews was analyzed using content analysis. According to

Cohen *et al* (2007) content analysis is a research technique for making replicable and valid inferences from the meaningful matter to the contexts of their use. Therefore, was used to summarize data from the field and report them as findings. This was done by coding the obtained data and categorizing them into themes for the purpose of creating meaningful units of analysis that appeared in terms of words, phrases and sentences. Quantitative data derived from documents and questionnaires were summarized in tabular form showing frequencies, sums, percentages and rank orders. Some of the quantitative data were used to construct grouped bar graph. Also, data were summarized from tables and bar graphs were analyzed and interpreted. The analysis was as follows;

3.10.1 Qualitative Data Analysis

In analysing qualitative data, the thematic analysis of the collected data was undertaken in order to understand the common pattern in the data. Therefore, the validated interviews collected from respondents in the study area was analysed using the methodology described by Leedy and Ormond (2001) as follows: -

Identified statement that related to the topic: Information from the interviews was broken up to reflect single, specific thoughts.

Grouped statement into meaningful units: The single specific thoughts were clustered into similar categories that reflect various perspectives of the respondents.

Sought divergent perspectives: Conflicting and similar perspectives was considered.

Constructed composite: Various meanings identified were develop an overall description of the road accidents causalities.

3.10.2 Quantitative Data Analysis

In analysing the quantitative data, the focus was on numerical information, l Babbie (2004). The statistical procedure in the research was conducted using Statistical Package for Social Science (SPSS) version 16.0. The quantitative data collected from the study was subjected to descriptive statistics analysis, comparing mean analysis (i.e. one to one t-test). Descriptive data was used in the study to describe the characteristics of the observed data and summary as statistic. Normally descriptive data is presented in graphical form Hair *et al*., (1995). They include frequency, mean, median, mode, range and standard deviation. The study used only mean and frequency, also used t-test to establish significance level of the obtained data.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSION

4.1 Introduction

The previous chapter three explains the designed methodology in this research, plus key elements in data collection and analysis as well as validity and reliability of the study. This chapter presents the results of the study based on the completed questionnaires and interviews with drivers, pedestrian, traffic officers and SUMATRA employees in Dar es Salaam region including 4 districts which were; Kinondoni, Ilala, Temeke and Ubungo municipals. The chapter have three sections, in which section one presented demographic characteristics of the Traffic officers interviewed and SUMATRA employees, whereas section two presented the demographic characteristic of the Pedestrians and Drivers and section three presents' results of the study.

4.2 Demographic Characteristics of the Traffic Officers and SUMATRA employees

The results that follow show the sample characteristics of respondents Traffic officers and SUMATRA employees, whereby frequency table were used for presentation of sample characteristics of these respondents. The respondents' characteristics also included gender, age, level of education, and experience in working with their respective offices. These results were presented as shown in the Table 4.1.

The results in the Table 4.1 shows that majority of respondents where male 57% and female 43%, however the different is not too big and this implies that the results came from both sexes thus the research was represented by both genders.

Table 4.1: Demographic Characteristics of the Traffic Officers and SUMATRA Employees

Variables		**Frequency**	**Percentage**
Gender of respondents	Male	20	57
	Female	15	43
	Total	35	100
	20-29 years	12	34.3
	30-39 years	19	54.3
	40-49 years	4	11.4
	TOTAL	**35**	**100**
Education level of respondents	Primary	5	14.3
	Certificate	21	60
	Diploma	4	11.4
	Bachelor	5	14.3
	TOTAL	**35**	**100**
Working experience	1 year	3	9
	2-5 years	4	11
	6-10 years	9	26
	11-15 years	13	37
	16-20 years	6	17
	Total	**35**	**100**
Location	Temeke	9	26
	Kinondoni	11	31
	Ilala	8	23
	Ubungo	7	20
	TOTAL	**35**	**100**

Source: Field data 2018

Whereas, the majority of respondents 54.3% where in the age of between 30 – 39 years, followed by 34.3 % from age of between 20-29, it can be said that, the majority of the respondents are young and the results are reliable since they came from people with clear mind to understand the road accident issue in Dar es salaam. All interviewed traffic officers and SUMATRA employees majority of them where having certificate (60%), primary level (14.3%), bachelor level (14.3%) and diploma (11.4%), this results implies that the results came from people with good level of education qualification and that the results of this study can be said to be valid

because they came from educated people. Also, the majority of respondents 37% and 26% had experience of working with their respective officers for 11 – 15 years and 6-10 years, this shows that the majority of respondents had enough experience with working with their offices and that they have enough knowledge with the issue and the answers given by them are valid. Lastly the majority of respondents 31% were found in Kinondoni district, followed by 26% in Temeke district, 23% in Ilala district and 20% in Ubungo district, thus this implies that the results came from 4 destructs and that the results can be said to be reliable since they represent most of the districts within Dar es Salaam region and that the results came from the majority, this implies the issue was more understood.

4.3 Demographic Characteristics of the Pedestrian and Drivers

The results that follow show the demographic data of the pedestrian and drivers' respondents, whereby frequency table were used for presentation of sample characteristics of these respondents. The respondents' characteristics included gender, age, level of education, driving experiences and if they have ever been in a road accident. These results were presented as shown in the Table 4.2.

From the Table 4.2 it shows that from all the respondents, 60% were male and 40% were female, thus the results come from both gender and that there was no respondent's selection bias in this study in terms of gender. Majority of respondents 60% where in the age of between 20-29, followed by 18% in the age of between 30-39 years, then 10% in the age of 50 years and above and 6% in each group of the age between 18 – 20 years and 40 -49 years, thus this shows that big number of the respondents were of the younger age which it is the most affected age and that they

are mature enough and were able to understand and asses the connection between different factors with the road accidents in Dar es Salaam.

Table 4.2: Demographic Characteristics of the Pedestrian and Drivers

Demographic	Measurement	Frequency	Percent
Genders of respondents	Male	30	60.0
	Female	20	40.0
	TOTAL	**50**	**100.0**
Age grouped of respondents	18-20 years old	3	6.0
	20-29 years old	30	60.0
	30-39 years old	9	18.0
	40-49 years old	3	6.0
	50 years and more	5	10.0
	TOTAL	**50**	**100.0**
Level of education of respondents	Primary education	5	10.0
	Ordinary level of secondary school	11	22.0
	Advance level of secondary education	3	6.0
	Diploma	11	22.0
	Bachelor	18	36.0
	Masters and PHD	2	4.0
	TOTAL	**50**	**100.0**
Driving experience	1-2 years	15	30.;0
	3-5 years	10	20.0
	6-10 years	9	18.0
	11-years to above	8	16.0
	No response	8	16.0
	TOTAL	**50**	**100.0**
Involved in motor accident	Yes	30	30.0
	No	62	62.0
	No response	4	8.0
	TOTAL	**50**	**100.0**

Source: Field data (2018)

However most of the respondents had a bachelor degree level of education 36% followed by Diploma level and Ordinary level both had 22% equally, primary education 10%, Advanced level 6% and Masters and above level 4%, thus the study was represented by people of all level of education and thus the results are not bias in terms of education level. Whereas most of the respondents (30%) had a driving

experience of 1 – 2 years, followed by (20%) with 3 -5 years of driving experience, of those who had driving experience of 6 -10 years were (18%) and 11% had driving experience of 10 years and above, this implies that majority of respondents had experience with driving in Dar es Salaam and thus they understand the causality of road accidents in Dar es Salaam.

Of those who answered the question of have you ever been in an road accident, majority (62.2%) said they have never been in accident whereas (30%) said they have been in an accident at least once while 8% didn't respond to this question, however with these results, it can be concluded that the study involved both people who had been in accident and those who have never been and that the results represented both population.

4.4 Presentation of Results to the Research Objectives

This section presents analysis of the results of the study obtained from the primary data as well as discussion arose during key informant interviews and document reviews. To start analysis and make the reader more aware of the discussion, a reader can go back to chapter one and review objectives of this study. During analysis stage researcher used mean scores, standard deviation and P-values to explain the results of specific objectives of the study. It must be noted that the mean is the average value of response for each item on the Likert scale. This is simply the sum of the values divided by the number of values. The implication is that the item with the highest mean is the one which most respondents or rated highly and vice versa.

Standard deviation is, however, a measure of variation. This uses all the observations, and is defined in terms of the deviation (xi-μ) of the observations from the mean, since

the variation is small if the observations are bunched closely about their mean, and large if they are scattered over considerable distances. This means an item on the Likert scale with the smallest standard deviation implies that consumers gave a similar answer to that item compared with the others.

4.4.1 Human Factors as a Cause of Road Traffic Accidents

The first specific objective was to assess the extent that the human factors have caused road traffic accidents in Dar es Salaam. The instruments/variables used to determine the extent to which the human factors have caused the road accidents in Dar es Salaam were; younger age, inexperience, excessive speeding, sickness, tiredness/sleeping, drinking alcohol, irresponsible behaviour, wrong overtaking, lack of driving knowledge, not following road signs, drug usage, inadequate visibility, mobile phone usage while driving, non-use of seat belts, non-use of helmets and improperly overtaking or cutting in the respondents (all of the respondents) were given questionnaires with 5 Likert points ranging from (1) strongly disagree (2) Disagree (3) Neither Disagree nor Agree (4) Agree (5) Strongly agree. The researcher used a frequency analysis to interpret the data and the results have been shown in the Table 4.3 and have been arranged according to the order of their important by ranking.

The results of the Table 4.3 show that, the extent that human factors have being causing road accidents in Dar es Salaam are as follows; most respondents agreed that, drinking alcohol (mean=4.65), irresponsible behaviour (mean=4.57), wrong overtaking (mean=4.50),not following road signs (mean=4.49),tiredness/sleeping (mean= 4.48), mobile phone usage while driving (mean=4.41), lack of driving knowledge (mean=4.38), excessive speeding (mean=4.31), inadequate visibility

(mean=4.21), drug usage (mean=4.19), inexperience (mean=4.07) and non-use of seat belts (mean=4.02) were the highest human factors that causes more road accidents causalities in Dar es salaam. whereby, improperly overtaking or cutting in (mean=3.92), non-use of helmets (mean=3.83), sickness (mean=3.39) and younger age (mean=3.09) were rated as moderate human factors in causing road accidents causalities in Dar es salaam and this implies that most of the road accidents are caused by human factors.

Table 4.3: Human Factors

Factors	Minimum	Maximum	Mean	STD	P-values
Drinking alcohol	1	5	4.65	.706	.000
Irresponsible behaviour	1	5	4.57	.791	.001
Wrong overtaking	1	5	4.50	.960	.017
Not following road signs	1	5	4.49	.856	.009
Tiredness/Sleeping	1	5	4.48	.792	.009
Mobile phone usage while driving	1	5	4.41	.858	.043
Lack of driving knowledge	1	5	4.38	.874	.074
Excessive Speeding	1	5	4.31	1.019	.294
Inadequate visibility	1	5	4.21	1.041	.681
Drug usage	1	5	4.19	1.173	.809
Inexperience	1	5	4.07	1.162	.624
Non-use of seat belts	1	5	4.02	.977	.378
Improperly overtaking or cutting in	1	5	3.92	1.108	.151
Non-use of helmets	1	5	3.83	1.060	.044
Sickness	1	5	3.39	1.291	.000
Younger Age	1	5	3.09	1.362	.000
WEIGHTED MEAN	4.15				

Source: Field data (2018)

4.4.1.1 Alcohol

Therefore the study found out that Drinking Alcohol contribute to the highest level in the road accidents that happens in Dar es Salaam, and this might be because as the results of alcohol drivers fail to control their vehicles especially at night and also they are no proper laws that have implemented in making sure that the driver don't drive with drinking alcohol or when they have passed the certain level of alcohol in their body.

Also, from the Key Informant Interviews with one of the SUMATRA officer's it was revealed that, a number of road crashes that they have witnessed were due to the drivers being drunk. These informants said that many cases of road accidents in Dar es Salaam are influenced by taking alcohol either when driving especially for the drivers of public transport (Daladala's) and those who drive private cars specially when they are going back home. Almost all the Traffic Polices, Pedestrian and Drivers agreed on these.

Msese, (2015), he reported that Drinking too much alcohol leads to serious physical and mental illnesses, because a major reason for drinking alcohol is to change mood or change the mental state. Thus, when one has taken alcohol, they change moods and adopt unnecessary behaviours that lead to over speeding and breaking the laws. More so, on the findings above on Table 4.3 over speeding was rated (mean= 4.31), and from the Key Informant Interviews it was found that most drivers they tend to over speed while drunk. Also, informants believed that when a driver is drunk, they develop confidence that make them break the road safety measures and one being not speeding on the areas with speed limits.

These findings are in line with those found by confirmed a study done by Department for Transport in Britain in 2004, which said that drinking alcohol and driving contributed to road accidents in that country. However, the difference in Dar es Salaam is that the percent of effects of drinking and drive reported in Dar es Salaam is higher than that of Britain. It was also confirmed by another study by Iribhogbe, (2009) who researched into the "Driver-Related Risk Factors in Commercial Motorcycle (Okada) Crashes in Benin City, Nigeria" among 996 "Okada riders", which also revealed that a total of 39.8% of the "Okada" riders had consumed alcohol prior to their involvement in an accident.

4.4.1.2 Irresponsible Behavior

While Drinking Alcohol was rated high but also Irresponsible behaviours (mean = 4.57) was rated second high by majority of the respondents, the study found that most drivers in Dar es Salaam they are irresponsible while driving and mentioned habits were over speeding when is not necessary, driving too close to the car that they are in front them, not following road traffics and regulations, not respecting traffic rights and improper changing of the lane. It was also revealed during the interviews that most of the time most drivers are not aware of the risk that are involved in while driving until the crash have happened. It should be noted that, inattentive, negligent driving, careless or being distracted while driving involves poor decision making while driving and can jeopardise people or property while driving a vehicle.

Parallel observation was also noted by Global Road Safety Partnership (2004). The weakening of the normal driver behaviour is viewed here as 'a reduce disability to perform adequately the various elements of the driving task'. The cause of driver

damages (or resulting too dangerous and unpredictable behaviour) may be the result of a number of factors such as alcohol consumption, drug ingestion, injury, infirmity, fatigue, the natural ageing process; or a combination of these factors. Furthermore, from the informant interviews the study found that most of traffic mortalities includes behaviours commonly associated with aggressive driving, such as over speeding which was also rated (mean = 4.39), running red lights, and improperly changing lanes or wrong overtaking which was rated (mean = 4.49). Similar to that, many of traffic injuries result from aggressive driving.

According to National Highway Traffic Safety Administration (NHTSA) (2006), has also noted the same. It noted that poor driving behaviour is problem not only in Tanzania, but it happens in another city. NHTSA identifies that driving behaviour is affected by age. The study continues to note that and driving experience coupled with their over confidence and risk-taking behaviours. High-risk behaviours include failure to wear safety belts, speeding, and driving while impaired (by alcohol or other drugs), and drowsy or distracted driving.

4.4.1.3 Excessive Speeding

Likewise, a study reported at WHO (2004) found that the higher the speed of the vehicle, the greater the probability of serious and fatal injury. The same report WHO (2004) showed that the higher the speed of a vehicle, the shorter the time a driver has to stop and escape a crash. A car moving at 50 km/h will usually require 13 meters in which to stopover, while a car moving at 40 km/h will stop in less than 8.5 meters. An average increase in speed of 1 km/h is associated with a 3% higher risk of a crash involving an injury. In severe crashes, the increased risk is even greater. In such cases,

an average increase in speed of 1 km/h leads to a 5% higher risk of serious or fatal injury, travelling at 5 km/h above a road speed limit of 65 km/h results in an increase in the relative risk of being involved in a casualty crash. For car occupants in a crash with an impact speed of 80 km/h, the possibility of death is 20 times what it would have been at an impact speed of 30 km/h. Pedestrians have a 90% chance of surviving car crashes at 30 km/h or below, but less than a 50% chance of surviving impacts at 45 km/h or beyond.

The likelihood of a pedestrian being killed increases by a factor of 8 as the impact speed of the car increases from 30 km/h to 50 km/h. To this end WHO (2009) summarized that, a 5% increase in average speed leads to an approximately 10% increase in crashes that cause injuries, and a 20% increase in fatal crashes.

4.4.1.4 Mobile Phone usage while Driving

Usage of Mobile phone (Mean = 4.41) was rated high by the participants, while mentioning that when a driver uses mobile phone while driving results to lack of focus to the road activities which most of the time cause road accidents due to this bad behaviour. Moreover, it was also revealed, that mobile phone use while driving is common among city drivers, despite of being considered dangerous due to distracted driving. This has influenced a number of accidents that some have taken people's lives and leave other with disability. WHO (2004) revealed that, the use of hand-held mobile telephones can adversely affect driver behaviour as regards physical as well as perceptual and decision-making tasks. The process of dialling influences a driver's ability to keep to the course on the road.

4.4.1.5 Non-use of Seat Belts

Also, the study found that not wearing a seat belt (Mean = 4.02) while driving can to the bigger percent increase the chances of getting high impact during car crash. According to the informant interviews a good number of lives can be saved every year if the passengers and drivers wear seat belts all time during the journey. There have been many campaigns in the country to increase awareness on wearing seat belts however, some drivers have not realized how much seat belts could save the lives of themselves and the life of their customers.

Also, have been reported in so many world news that, what makes this fact more complex is that, although it is the worst in most of the developing countries of the world, it is a usual phenomenon in some most developed countries to see drivers with no use of seat belts while driving on public roads. WHO (2010) suggests that; In France, where the wearing rate is among the highest, it was estimated that, in 2007 if every passenger and driver had worn a seatbelt, 397 lives could have been saved (around 9% of total fatalities). Wearing a seat belt reduces the risk of a fatality by 40 – 50%. Another study by Lisa, David et al. (2005) shows that, not wearing a seatbelt is the most common cause of fatality, which contributes to fatality among 63% of all vehicle occupants.

In addition to this WHO (2004) have stated that Rates of seat-belt use vary greatly among different countries, depending upon the existence of laws mandating their fitting and use and the degree to which those laws are enforced. In low-income and middle-income countries, usage rates are generally much lower. Seat-belt usage is substantially lower in fatal crashes than in normal traffic. Correctly used seat-belts

reduce the risk of death in a crash by approximately 60%. In absolute similarities, supporting the above studies, WHO (2009) added that if a seatbelt was correctly used, it would reduce the risk of fatality among front seat passengers by 40-50% and among the rear seat car occupants by 25-75%.

4.4.1.6 Inexperience

From the results, it was found that Inexperienced drivers (Mean = 4.07) can also influenced the in proper behaviours while driving and causes road traffic accidents. For example, it was reported by (WHO, 2004) that Inexperienced young adults driving with a blood alcohol content of 0.05 g/dl have 2.5 times the risk of a crash compared with more experienced drivers. If a blood alcohol content limit is static at 0.10 g/dl, this will upshot in three times the risk of a crash than that at 0.05 g/dl, which is the most common perimeter in high-income countries. If the legal limit stands at 0.08 g/dl, there will still be twice the risk than at 0.05 g/dl. Alcohol ingestion by drivers puts pedestrians and riders of motorized two-wheelers at risk. Whereas Younger age was rated (Mean = 3.09) by the participants in the study.

However not very many believed younger age can influence the causalities, but since younger age means inexperienced thus the chances of getting road accidents becomes higher. It was mentioned that, the age of drivers affects to the behaviour of their driving styles and to the level of driver's attention. In similar sense (WHO 2004); Lisa, David et al. (2005) argued that Crash rates of male drivers aged 16–20 years were at least three times the estimated crash rate of male drivers aged 25 years and above. Teenagers are significantly more likely to be involved in a fatal crash than

older drivers. At almost every blood alcohol level, the risk of crash casualty declines with increasing driver age and experience. In addition to this a study on drivers killed in road crashes estimated that teenage drivers had more than five times the risk of a crash compared with drivers aged 30 and beyond, at all levels.

4.4.1.7 Non-use of Helmets

The use of helmets was mentioned by the informants in a study to have a dominant role in reducing the severity of road traffic accidents. However, the non-use of helmets was rated (Mean = 3.83) with the study participants, but very few drivers wear helmets in Dar es Salaam, even with the current strong rules against drivers and passengers who don't wear helmets while using motorcycles. More so, many drivers in different countries of the world are enjoying their journey without using helmets until the worst effect of failing to use helmets come in to their lives.

Regarding to this WHO (2004); (WHO 2009; WHO 2010) mentioned that, Non-helmeted users of motorized two-wheelers are three times more likely to sustain head injuries in a crash compared to those wearing helmets. Helmet-wearing rates vary from faintly over zero in some low-income countries to almost 100% in places where laws on helmet use are efficiently enforced. Though helmets have generally been extensively worn in most high-income countries, there is a confirmation of a decline in practice in some countries. More than half of adult riders of motorized two-wheelers in some low-income countries do not wear their helmets appropriately secured. Child passengers rarely wear helmets, or wear adult helmets that do not effectively protect them. Helmet use does not have adverse effects on neck injuries, visibility or the ability to drive safely in traffic. Wearing a motorcycle helmet

correctly can reduce the risk of death by almost 40% and the risk of severe injury by over 70% (WHO 2010).

Inconclusion, there are so many human factors that was mentioned by participants of the study that has resulted to the increase of road accidents in the recent years, some of the human factors mentioned were; lack of driving skills, poor knowledge of drivers and pedestrians over traffic rules and regulations, violating speed limits by drivers, insufficient traffic law enforcements, lack of timely vehicle maintenance, driving under the influence of drugs and alcohol, failure to observe and respect road traffic signs, failure to give way for pedestrians, failure to give way for vehicles, lack of sidewalks, lack of road traffic signs, improper overtaking, improper turning and excessive loading. Also, drivers do not follow necessary procedures and laws guiding the driving behaviour such as how and when to overtake. They do not stop in areas with zebra while they see pedestrian want to cross the road.

4.4.2 The Extent of Climate Factors in Causing Road Traffic Accidents

The second specific objective was to examine the extent that the climate factors have caused road traffic accidents in Dar es Salaam. The variables used in this objective were: heavy rainfall, travelling in darkness, hot environmental condition and strong winds it is very certain that climate change induced changes in weather factors will affect road safety, if proper adaptation measures are not taken.

The results of this analysis have been given in the Table 4.4 using descriptive analysis and regression, whereby mean score, standard deviation and P-value were used. The variables with highest mean are the one which were voted to be the significance

climate factor that accounting for the level of road traffic accidents in Dar es Salaam and vice versa. More explanation concern with mean, standard deviation and rank have been given at the beginning of this chapter.

Table 4.4: Climatic Factor

Factors	Minimum	Maximum	Mean	STD	P-value
Heavy rainfall	1	5	3.96	1.173	.287
Travelling in darkness	1	5	3.88	1.313	.573
Hot environmental condition	1	5	3.86	1.283	.646
Strong winds	1	5	3.40	1.294	.064
WEIGHTED MEAN	3.77				

Source: Field data (2018)

The results of the Table 4.4 above show that, the extent that climate factors have being causing road accidents in Dar es Salaam are as follows; Most respondents agreed that, Bumps and badly maintained roads (Mean= 3.96), Travelling in darkness (Mean=3.88), Road potholes (Mean= 3.86) and Strong winds (Mean= 3.40) were all rated as moderate factors in causing road accidents causalities in Dar es Salaam.

4.4.2.1 Heavy Rainfall

During rainy season the road become wet and this becomes a problem to many road users Shubhayu, (2016) reported that in many places the rate of road accident tend to increase during rainy season since the presence of rainy rain season reduces visibility also sometimes due to the splashed water which is thrown by other vehicles affects the visibility of the driver which may though some authors believe that during rainy season the rate of road accident decrees since people becomes more careful while driving but this is not the fact since presence of humidity during rainy season reduces visibility of the driver rainfall can cloud windows and windscreens Golob and

Recker, (2014) supported that during rainy season the cars tend to loss direction due to the friction of the road surface since it leads to dynamic aquaplaning. Also, it was added that during rainy season the water tend to distract some of the car parts and cause rust to the car, which may lead to greater destruction.

4.4.2.2 Travelling in Darkness

During night hours, worse things occur especially in places where there are no road lights drivers find it difficult to see what is happening on the road. Climatic changes such as the rainfall reduces the visibility and hence lead to car accidents Shahid and Minhans, (2016) asserted that the nature of human eyes requires light so as to see, the pupil within the eye dilate in the darkness and that gives the aye ability to adjust at the lower level of light, therefore with the absence of light causes several problem on the vision hence Sometimes people in the night they do not keep the distance between one car and another using the headlights they cannot even see up to 160 feet away Sometimes the dashboards light are not kept at a lower setting to allow the constraint between the dark and the bright which impedes the vision hence it limits the brightness of the car. One among the drivers who was interviewed reported that: -

> " *it's true that darkness is among the major causes of road accidents, we may try to use the artificial lights so as to chase the darkness away but still we cannot cover all areas, when there is darkness even the vision reduces its ability and this makes the driver to concentrate in one are therefore if anything happens on the other side it's hard to see, it's hard to chase the darkness but I as among the drivers I think the road lights are very important since they give light to the driver to see things from a far distance".*

So far, the study believes that the road accidents accident could be reduces when the government decides to enforce laws that will prevent the drivers from driving at night though this is found to be difficult. Wangdi*et al*, (2017) on his study reported that the

drivers need to make sure that all the lights are well functioning regardless of the time which is driving sometimes heavy rainfalls can lead to heavy darkness.

4.4.2.3 Hot Environmental Condition

Hot climatic condition has also been reported to be among the climatic factors that leads to car accidents simply because during car accidents the car tyres expand and burst and lead to car accidents, also sometimes overcooling of the car engine can lead to car accident. Yubian and Yubian, (2016) reported that during summer seasons road accidents occurs due to unfamiliar detours and driver destruction, which is caused by overheating. One driver who was interviewed reported that:

> *"It's true that during summer season road accidents occur, When the sun is overheating the earth surface becomes hot such that if you travel in a long journey the tyres tend to burst and when the car is in a high speed then an accident may occur either to the driver himself or herself or to the third party. It's hard to control this type of case because it's unforeseen. There for during hot season it's better to travel a long distance before the sunset and after the sunset"*

The study further revels that during hot seasons the car engine may fail suddenly this is due to overheating of the engine system, which leads to car break up. Also, it may cause a serious problem when the motor vehicle user does not realize on the spot. Therefore, the study suggests that it's better for this type of problem the car user to make his or her journey after sunset so as to avoid overheating which may lead to serious problem.

4.4.2.4 Strong Winds

Sometimes assume of the road accidents are caused by the strong wind, controlling wind its uncontrollable event it happens at any time depending on the climatic

conditions, Parrels, (2015) reported that strong winds are among the major course that causes road accidents to occur. Strong winds have the ability to break trees branches that can block the road accidentally also sometimes they blow out the vehicles. Not only that but the wind contains the dust particles, which is associated with sand, and this may make the driver not to see the way forward. One among the driver who was interviewed reported that.

> "*I have been in a drive one day where a strong wind came with full of dust particles where it blocked our car our driver could not be able to see clearly in front there for the car started to lose direction and we found ourselves knowing the nearby car which we couldn't see coming , lucky enough no one was injured during the accidents. Therefore, strong wind is uncontrollable event that cannot be controlled by human beings therefore whenever situation happens, it's better stop driving for a while so as to let the wind calm down*."

Raban*et al*, (2014) reported that in bear land where there are no buildings or trees the speed of wing blows in a high speed such that it's able to lift up any moving object. For that case the weather forecasters need to be more careful in reporting this incidence concerning the weather. With that precaution will prevent drivers from the unnecessary movement or take any necessary precautions.

4.4.3 The Extent of Mechanical Factors in Causing Road Traffic Accidents

The third specific objective was to examine the extent that the mechanical factors have caused road traffic accidents in Dar es Salaam. The variables used in this objective were: Break failures, Defective lights, Dazzling lights, Age of the car and Failure of the engine. The results of this analysis have been given in the table 4.5 below using descriptive analysis and regression, whereby mean score, standard deviation and P-value were used. The variables with highest mean are the one which

were voted to be the significance climate factor that accounting for the level of road traffic accidents in Dar es Salaam and vice versa. More explanation concern with mean, standard deviation and rank have been given at the beginning of this chapter

Table 4.5: Mechanical Errors

	Minimum	Maximum	Mean	STD	P-value
Break failures	2	5	4.52	.836	.000
Defective lights	1	5	3.98	.941	.367
Dazzling lights	1	5	3.78	1.146	.675
Age of the car	1	5	3.54	1.187	.087
Failure of the engine	1	5	3.43	1.453	.063
WEIGHTED MEAN	3.85				

Source: Field data (2018)

The results of the table 4.5 above show that, the extent that mechanical factors have being causing road accidents in Dar es Salaam are as follows; most respondents agreed that, break failures (mean= 4.52) is the highest mechanical factor in causing road accidents. Whereas defective lights (mean= 3.98), dazzling lights (mean=3.78), age of the car (mean= 3.54) and failure of the engine (mean= 3.43) were all rated as moderate factors in causing road accidents causalities in Dar es salaam.

While human error is found to be the most frequent contributing factor to road traffic accidents, vehicle defects are reported as playing a role. In general, this implies that the occurrences of accidents are associated with a number of causalities ranging from road users, vehicles, road layout and environmental conditions. Noticeable, this also happens in other countries especially the developing countries. As noted by Bekibele, (2007) of which this study concurred, revealed that in Nigeria mechanical factor contributes for about mechanical fault (50%), and bad road (12.5%). In similar manner Vogel and Bester, (2005) from Pretoria in South Africa have noted the same.

Their study revealed that, human factors accounts for (95%) to RTA while road environmental factor for (28%) and mechanical factor for (8%). Furthermore, the forgoing has also noted in the New Delhi India, where Archana Kual*et al*, (2005) reported that the important factors for RTA are human errors, driver fatigue, poor traffic sense, mechanical fault of vehicle, speeding and overtaking violation of traffic rules, poor road conditions, traffic congestion, and road encroachment.

4.4.3.1 Break Failures

Break failures is also among the mechanical factor that leads to car accidents. Sometimes in the manufacturing industries faults occur and this may lead to serious problem to the final consumer. Sometimes it's hard to identify the mistake but it's not the fact the car users need to be more careful before using the car, this includes check up on the essential parts of the car. Vecsei and Kovacs,(2014) reported that the leak in the break pipes may be among the factors that could make the break fluids to leak out hence lead to break failure and causes the car accident.

The study further added that the Squealing noise could be among the alert that informs the driver on the breaks than they have either worn down or they need to be replaced by new ones.

> " *I have been a witness in an accident where the car seemed to lose its direction as it was moving down the slope, 8 people were injured when the police officers came to investigate on the car accident it was reported that the major cause of the car accident was due to break failure that made the driver fail to stop the car while it was moving in a high speed."*

Islam *et al,* (2019) argued that it should be a daily habit of everyone who is using the car to make check-ups so as to identify where there is a smell of oil linkage and

making sure that the breaks are tested, by doing this it is very simple to realize when the problem arises. Also, in steep slopes drivers need to be more careful since they don't know what will happen.

4.4.3.2 Light problem

The other cause of road accident was reported to be light problem. It's true that at night it's not easy to walk on darkness. When the car lights are not functioning the; it becomes worse since the car driver may lose direction and get an accident or even knock the road pedestrian. Some of the lights are Defective which means that they cannot function well, a sudden failure of the light while on the road could lead to accidents. Also, there are other cars which were reported to give Dazzling light this had impact to other road users since the brightness of the car could also destruct the road users found within the area or to the one who is approaching the car. The study reported that there are some drivers who are not concerned with their lives simply because they have the courage to drive the car while the car lights are broken. The study suggests that it is better when the car lights are broken then to avoid night trips or to make a quick replacement of the defected part. The researcher interviewed one of the police officers and it was reported that: -

> " *To be honest many drivers are not afraid with their lives they take life simple, as police officer we have to make sure that all the drivers there lights are working properly so as to reduce the rate of car accidents, though sometimes they campaign that all there lights were ok when they started the journey and suddenly they stopped working. Driving in darkness it's very dangerous there for it should the responsibility*"

Mannering, (2016) reported that some of the drivers are ignorance and not well educated they travel in dim light and letter on they turn into full light. This problem

affects the other driver who is approaching towards the car hence may destruct the driver and lead to car accidents. The flash light reflects into the light of the coming driver hence it impairs their site. It's obvious that there is a great possibility that the car drivers are not well educated on how to use the lights at night this is because during their driving class they don't get the night instructions and this happen to be a serious problem since they lead into car accidents.

4.4.3.3 Age of the CCar

It was discovered that old cars are the major cause of car accidents since almost all the spare parts of the car are old and this makes the car to fail to function properly. Old cars have alot of disturbance since they require maintenance all the time and this leads to loss. Sometimes it's very rear to find that a used car has all the required parts that needed in the car, sometimes the seat belt may be missing, or sometimes may have light defect, the locks may not be properly functioning and so many other problems that cannot be mentioned. Hancock, (2019) reported that everything that is made has its depression time or every product that is made has its life span and this goes the same to the cars the more you use the car the more its warmouth. The study had to find out what others had to say on the age of the car and this was what was reported: -

> *"I understand the fact that using old cars its risky and its cost full since the bus am using brings allot of problem sometimes it fails at the middle of the road during the traffic lights have been released and find myself in the middle of road failing to move ward i almost caused an accident with a motor vehicle where it was moving in a high speed and letter on my car stocked and when the motor vehicle came it got an accident since*"

The study further revels that most of the cars that are imported in Tanzania are used cars which had already lost its function in the developed countries and it is sold back in developing country. Also, there is a fact that most of Tanzanians are middle income

earners and lower income earners there for they will prefer to buy the products that they can afford depending on the level of income. Only few people can import new cars from outside the country. Therefore, by considering this fact when a car gets old and its functionality tend to depreciate in value and this makes some part of the car not to function properly. The failure of any part of the car during driving may lead to road accidents.

4.4.3.4 Failure of the Engine

Engine is very essential part in the car, a car may not move if the engine fails to function as required. Sometimes engine fail due to the age of the car. When a car is used more frequently then there is a possibility of engine failure. Other reasons which may lead to engine failure corroded battery cables, damaged full pump, discharged battery and sometimes due to failure of starter motor. An engine may fail at the middle of the journey unexpectedly and the situation becomes worse when the car is on the steep slope. The study also discovered that lack of coolant is a serious problem according to the standard practice the engine needs to be flushed after every 30,000 miles or 3 years which it seems is something which is not easy to many people due to the standard of living. But if not done so then more costs will be incurred which might even require the car user to make replacement of the spare part.

Hancock, (2019) who is a mechanic and managing director of Duke Cars asserted that the problem with engines is that; when an engine is poorly maintained due to service delay will lead to engine fuel failure. Also, it was added that other accident due to engine failure may occur when the driver fails to replace the worn-out spark plug, the oxygen sensors and the fuel filter. Therefore, the study reports that failure to take care

of your car may lead to greater loss than expected this includes even getting and accidents. The car drivers or the users need to be aware of all the possible factors that may lead to road accident so as to reduce or eliminate the unnecessary accidents.

4.4.4 Measures that can be used to Reduce Road Traffic Accidents in Dar Es Salaam

The fourth objective was to identify the measures that could be used to reduce the road accidents explains the possible measure that has been obtained to reduce road traffic accidents in Dar- es-salaam. Both interview and documentary review were used by the researcher. The police officers, pedestrians and the drivers were asked on the necessary measures that could be responsible in reducing road accident. Generally, the study discovered different measures that could be used to reduce the road accidents which are:

(i) Development of comprehensive road safety program

(ii) Link between the driving schools and the police stations

(iii) There should be a continuous driving training

(iv) Health status

(v) Law enforcement

4.4.4.1 Development of Comprehensive Road Safety Program

These are the special program that will help in giving education to the road users who are using the road. This program should be implemented in Media's social network where they may find a lot of people and giving them proper education. Shubhayu*et al* (2017) argued that it's obvious that many drivers use their whole parts of the body in driving but they don't use their brain while driving. For that case the drivers need to

be well cancelled through the programs so as to make them realize that they don't need to be in stress while driving or in great depression while driving this might cause serious problem. One among the respondent who was a driver reported that: -

> *"Driving it's not easy as the way people think it needs a lot of concentration, there are different programs that are conducted concerning the road accidents but still this program does not reach to all people, as for we bus drivers who spend almost all the day driving it becomes difficult for us to participate in those program which are conducted in the television. But if this programs could be conducted in the radio program at list each day then we would be more aware of the causes and how to overcome those obstacle, sometimes we are in difficult situations and we don't know the way forward but only if this programs were conducted effectively I think the road accidents would be reduced to some extent."*

The study believes that good communication is that which is transferred in the right time to the right person. Renuraj, (2015) reported that there are some factors that makes the drivers not to follow the rules and this is due to advancement of technology such as the use phone rally distract people especially when driving. This means that the driver will fail to concentrate on one are while trying to solve the arrived issue at the other hand. Therefore, in order to make these program effectives they should find proper ways that could be used in conducting the program so as to meet the targeted goal of reducing the road accident.

4.4.4.2 Link between the Driving Schools and the Police Stations

These two parts are very important when learning how to drive this will allow the learner to get more experience from both parties. Therefore the study believes that there is a need of linking these two parts together so as to make sure that all students who attend driving classes are close with the police officers who will be able to guard them with relevant example on how accidents may occur and the ways that could be

used to avoid the accident. Herbst, (2006) reported that educating people on how to drive safety is not enough sometimes they need to be close with the police officers while learning so that they may be corrected once they do mistakes. It's the smallest mistakes that lead to bigger mistakes. Therefore, it is very important to correct the smallest mistakes before they become a habit.

Shope, (2016) reported that not all drivers are trained from the driving schools, there for the learners may adopt improper laws and the strategies that may lead to an affect the driving behavior and the safety of the car user. Inviting the police office in this learning center it gives the room to the police understand on the right students who need to get the driving license. By doing this will reduce the number of drivers who are disqualified and are given license as qualified students both parties need to be careful hence by doing this the number of road accidents caused due to carelessness will be reduced since the license will be taken back to the police station and require the driver to go back to the driving school so as to get his or her driving license.

4.4.4.3 There should be a Continuous Driving Training

Continuous driving is a sort of training program that allows car users to get more knowledge on the proper ways of using the car. These means that when the drivers complete their studies after getting the driving license to get a chance to understand more the other parts of the car including how to take care of the car parts once they are broken. By doing this the car drivers will be able to know how to fix the engine parts of the car will also know how to solve the break failure problem. With this knowledge it will make the drivers to fix the problem whenever it occurs so as to avoid the accidents. There are some of the drivers who do not solve the problem on

the spot due to the financial issues, with this training program will bring alert to the drivers and know how to find better solutions. One among the respondent who was interviewed reported that:

> "*It is very important to know the defects of your vehicle so as to realize any unusual behavior that will be arising to my side I suggest there should be a continuous training that will be given to those who have already received their license will be attracted to go back to the learning institution so as to reduce the unnecessary cost that are incurred by the driver in repairing for their car with this opportunity they will be able to learn the whole package instead of spending their money every time in repairing their car".*

Raban *et al*, (2014) car repair and maintenance is very important part that needs to be learned by all drivers. Some of the driving schools that are providing driving program do not consider much on teaching their customers on how to evacuate from the problem when accidents occur. Therefore, of this program is well implemented then it will allow many drivers who are willing to learn to get the training program so as to resolve the breakdown issue which could be easily solved.

4.4.4.4 Health issue

Having a good health, it's a duty of every one, drivers need to have good healthy while driving this is for their precaution. Some of the diseases such as heart attack, blood pressure sight condition, blood pressure, hearing defect and muscle tone may lead to car accidents when the driver is attacked. The study discovered that there is a great need of the traffic officers checking the health conditions of the drivers when they go to renew the license. The study believes that these diseases need to be checked so as to know the health condition of the driver. Since are the most common diseases that affect many people one among the respondent reported that:

> "*It's true that poor healthy condition may lead to road accident. It's obvious that almost everyone is sick but sometimes there are some of the disease that may not be controlled easily, diseases such as heart attack it's hard to control people with this condition they don't have to travel alone in a long distance since the accident does not choose on the time to occur. It's time that everyone should know his or her condition before he she starts the journey this will reduce the number of accidents which are caused due to health problem*s".

Chador *et al*, (2017) argued that many people tend to drive while they are in great depression and this makes them to have to lose concentration while driving. The heavy pains that are accompanied by disease leads into distraction and this make the driver to lose direction and fail to control vehicle from getting the accident. Therefore, the road users should avoid being alone while using the road this is by asking assistance to the good Samaritans that will be ready to give them some help.

4.4.4.5 Law Enforcement

The study realized that it is very important to enforce the laws so as to reduce the number of road accident that are occurring within the country. Sometimes it's very difficult in balancing the effectiveness of the traffic officers and the improvements that that have been achieved. Law enforcement should be a duty of every person who is using the roads regardless is a driver or pedestrians and not left as a task of traffic officers, by doing this both parties will start to leans on their rights and laws that have been enforced so as to avoid the unnecessary mistakes.

The study further believes that; the policies needs to be supported with proper tools that will help in making sure that the laws are well enforced. Machumu, (2015) stated that the breathalyzer tests need to be increased in the roads so as to identify easily the people who are discover the drivers who are driving while they are drunk.

Law enforcement should also contain penalty payments to those people who are found breaking the laws. A good example is to those drivers who are not wearing the seat belts. By doing this it will help drivers to remember on the importance of wearing the seat belts while driving Hammoudi, (2014) reported that failing to wear the seat belts its very dangerous since when the accident occur the driver won't be able to hold himself or herself back from the current position. When the laws are well adhered by both parties then the number of road accidents will be reduced since everyone will be aware on the Consequences and the impact that may occur after they break the law.

4.5 Discussion of the Findings

The first objective of the study was based on the Human factors as a cause of road traffic accidents. Human factor this are the factors that are caused by the error which are conducted by human beings due to irresponsive behaviour. The study discovered that some of the errors are easy to control if the responsive measures are taken.

Behaviours such as wrong overtaking, not following road signs, tiredness/sleeping, mobile phone usage while driving, lack of driving knowledge, excessive speeding, inadequate visibility, drug usage, inexperience and non-use of seat belts such as alcoholism were considered to be among the factors that resulted into road accident. Referring to the empirical review which was conducted by Hammad *et al* (2012) who conducted the study on the human factors that lead to road accident discovered that human error such as stress is among the factor that caused road accidents.

The second objective was based on the climate factors in causing road traffic accidents. Climatic factor can be termed as the uncontrolled action that cannot be

overcome by human willingness presence of rainfall, hot environment, and strong wind were discovered to be among the factors that contributed to road accident. In many cases the climatic factors happen to distract man made environment and this led to great distraction.

This finding happens to be true as relating to the empirical review conducted by Shankar *et al*, (1995) supported that poor visibility due to rainy or snowy weather, referring to the study which was conducted by Lankarani *et al* (2014) conducted the study on the same climatic factors but on their findings it was revealed that dusty weather had the highest death rate compared to other weather conditions.

The third objective was the extent to which Mechanical factors caused road traffic accidents, the study has revealed that human error such as break failures, Defective lights, dazzling lights, Age of the car and Failure of the engine were among the causes that lead to road accident. From the empirical review section of this study, the study conducted by Pharless, (2015) also recognized mechanical factor as among the factors that lead to road accident. Therefore, there is a great need of identifying all the possible causes so as to reduce the rate of death caused by motor vehicles.

The last objective was to identify the measures that can be used to reduce road traffic accidents in Dar Es Salaam. After identifying the factors that lead to road accident the researcher had to provide some measures that could be used in reducing the road accident. Which were Development of comprehensive road safety program, Link between the driving schools and the police stations; Link between the driving schools and the police stations, there should be a continuous driving training, Law

enforcement. This objective is related with the study conducted by Christopher (2015) who recommended on provision of awareness through Medias as a way of communicating at the ways of preventing road accidents also the study had to recommend on the improvement of infrastructures and strict penalties to people who will be going against road traffic rules.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter explains mainly on the study background and the objectives of the study also recommendations are provided to suggest possible solution to the impact

5.2 Summary of the Main Findings

The study focused on the assessment of Road Accident Causality in Dar es Salaam a case of reported motor vehicle accidents. The study contained four specific objectives so as to attain the main objective. These questions were to what extent the human factors have caused road traffic accidents in Dar es Salaam? To what extent the climate factors have caused road traffic accidents in Dar es Salaam? To what extent has the mechanical errors cause road traffic accidents in Dar es Salaam? and What are the measures that can be used to reduce road traffic accidents in Dar esSalaam? The obtained results are summarized as follow:

5.2.1 Human Factors as a Cause of Road Traffic Accidents in Dar es Salaam

On the findings it was revealed that drinking alcohol contribute to the highest level of road accidents since the drivers fail to control their vehicles especially at night. Also, it was discovered that there are no proper laws which have been implemented so as to make sure that the driver doesn't drive while drinking alcohol. Irresponsible behaviors were also among the human factor which was mentioned where it was recognized that most of driver used high speed throughout the journey, some they keep close distance to the other car that were in front them which is too risky, other mentioned irresponsible behavior were disobedience of the traffics and the provided regulations

while other did not respect the traffic lights and improper changing. The use of mobile phone was discovered to bring a lot of effects to the driver since this is when the driver lose focus of where is going or when he she gets destructed. So far, the study revealed that; wearing of the sit belts could serve a lot of people from getting the car accidents.

5.2.2 The Extent of Climate Factors in Causing Road Traffic Accidents

During rainy season visibility decreases also the road become wet and slippery and this becomes a problem to many road users. it was also discussed that at night hours worse things happen especially in places where there are no road lights drivers find it difficult to see what is happening on the road. During hot climate the study reported that the tires expand and burst and lead to car accidents, also overcooling of the car engine leads to car accident. Strong wind accompanied with durst particles appeared to block the driver while driving and this leads to car accident.

5.2.3 The Extent of Mechanical Errors Causes Road Traffic Accidents in Dar es Salaam

Break failures was reported as the mechanical factor which could be caused by the leak in the break pipes which makes the break fluids to leak out hence lead to break failure and causes the car accident. Defective light is was also found to be among the major causes of road accidents, poorly maintenance of the car parts such as the lights may lead to suddenly failure of the lights while driving and this makes the driver fail to see forward hence leads to car accident. Uses of old cars are also reported to be the major cause of car accidents since spare parts of the car are already old and this may lead to car failure.

5.2.4 Measures that can be used to Reduce Road Traffic Accidents in Dar es Salaam

Finally, the last objective reported that special program is very important in giving education to the road users through Media's, social network where they may find a lot of people and giving them proper education. Also, there is a need of linking these two parts together so as to make sure that all students who attend driving classes are close with the police officers who will be able to guard them with relevant skills. furthermore, it was discussed that there should be a continuous driving because that allows the drivers who have completed their driving lessons to get a chance to understand more the other parts of the car including how to take care of the car parts once they are broken. Moreover, the health condition is among the part that needs to be considered when the bus drivers go to renew their driving license, also it encouraged on the enforcement of laws so as to reduce the number of road accident.

5.3 Conclusion of the Study

The study concludes that road accidents in Dar es salaam can only be reduced if human factor causes that the study found to have biggest extent in causing road accidents can be reduced, people are well educated on the proper ways of using the roads, also the drivers need to make sure that they are able to correct the mistakes of their fallow driver once they occur on the sport this will allow them in realizing their mistakes on the spot by doing this it will be of great help to those drivers who are law breakers they only observe the law when they see traffic, drivers should stop practicing irresponsible behaviors such as using mobile phone and drinking alcohol while driving. Also, education should be given to road users on what to do and behave on harsh climate conditions such as heavy rainfalls, heavy darkness and hot seasons to

avoid further accidents. Also, strong laws should be implemented on age of the cars manufactured that are imported in the country.

5.4 Recommendations of the Study

Based on the findings of the study the following recommendations have been identified in order to reduce the number of road accidents then the following measures should be considered. These are as follows;

(i) The study revealed that the government should consider the road safety as the political priority by insisting people on the proper ways of using the roads; also they should develop a multidisciplinary approach on the road safety and setting up budget that will assist in making maintenance of the parts, which are distracted due to climatic changes.

(ii) Also, the policy makers need to enact policies that will require use of seat- belts, and wearing of the motorcycle and bicycle helmets as to protect the users once sudden accident occurs. Also, the policy makers should amend the policies that will require all road users to use appropriate speed that has been set so as to minimize the risk of those who are addicted to high speed.

(iii) Also, the health centers should be responsible in giving awareness on the health losses that could be caused due to accidents by giving the statics of the patients who have been admitted due to road accidents.

(iv) Car traders should be responsible in educating their clients on the proper ways of using the cars and how to keep a good maintenance of their cars so as to avoid sudden burst of the tire and who maintain the car engines.

5.5 Limitations of the Study

(i) Most officers who were interviewed, who are accident investigators considered most of the road accidents causalities causes under the title of carelessness" since the researcher slack the correct equipment and training to determine more specific causes.

(ii) Getting permission on collecting data from different respondents especially the SUMATRA officers and Traffic officers was a very long process and probing for dipper information was hard since most of them where not ready to openly talk about the issue. These procedures must be reviewed and there should be an adequate system to gather data from the traffic police departments in future.

5.6 Area for Further Studies

The study believes that road accidents are one of the many causes of lack of human development in Tanzania since its affect the health of the person involves and reduce the man power in the country which hinders the development of the country, also the accidents do not occur only in Dar es Salaam there are other regions where road accidents occurs frequently. Therefore, the study suggest that other researcher should conduct also their studies indifferent regions so as to identify more factors that could lead to road accidents and the ways that could be used to solve the problem by reducing the number of death and disabilities that people get due to road accidents.

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APPENDICES

Appendix 1: Questionnaire for the Pedestrians and Drivers

Dear respondent,

The purpose of this questionnaire is to gather information for the research study on ***Assessment of Road Accidents Causality in Dar Es Salaam; A Case of Reported Motor Vehicle Accidents In 2018***, which is taken as partial fulfilment of a master**'s** degree in Business Administration at Open University of Tanzania.

The researcher wishes to assure you that the information so obtain will solely be used for the purpose intended. Your cooperation is highly appreciated.

You are kindly asked to fill in the questionnaire. Your answers and all information received will be treated as confidential. Upon publication of the material will be referred to anonymously, and no information can be traced back to a single individual.

Thank you in advance for taking part in this exercise.

Section A.

1. What is your gender?

Male	Female

2. Select your age group.

18-20 years	20-29 years	30-39 years	40-49 years	50 and above

3. Select your highest academic or professional qualification? Select only one

Primary school	Secondary school	Advanced level secondary school	Diploma	Bachelor	Master/PGD	PHD

- Others (specify) _____

4. What is your driving experience?

1-2 years	
3-5 years	
6-10 years	
11 >above	

5. Have you ever been involved in an accident?

1)Yes	2)No

6. What was the reason the accidents?

_____

_____

_____

__

SECTION B.

7. a) The study wants to know the extent that human factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following variables have been human factors causing traffic accidents in Dar es salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Younger Age					
Inexperience					
Excessive Speeding					
Sickness					
Tiredness/Sleeping					
Drinking alcohol					
Irresponsible behavior					
Wrong overtaking					
Lack of driving knowledge					

Not following road signs					
Drug usage					
Inadequate visibility					
Mobile phone usage while driving					
Non-use of seat belts					
Non-use of helmets					
Improperly overtaking or cutting in					

b. In your opinions what should be done in order to reduce human factor cause of traffic accidents in Dar es Salaam

_____
_____
_____
_____

8. a) The study wants to know the extent that climatic factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following climate factors variables have been causing traffic accidents in Dar es Salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Rain					
Strong winds					
Road potholes					
Bumps and badly maintained roads					
Travelling in darkness					

b. What are the other climate factors that cause road traffic accidents in Dar es Salaam?

_____
_____
_____
_____

9. a) The study wants to know the extent that mechanical factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following mechanical factors variables have been causing traffic accidents in Dar es salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Failure of the engine					
Break failures					
Age of the car					
Defective lights					
Dazzling lights					

b) What are the other mechanical factors that cause road traffic accidents in Dar es Salaam?

_____
_____
_____
_____

Appendix II: Questionnaires for the Traffic Police

Dear respondent,

The purpose of this questionnaire is to gather information for the research study on ***Assessment of Road Accidents Causality in Dar Es Salaam; A Case of Reported Motor Vehicle Accidents In 2018***, which is taken as partial fulfilment of a master**'s** degree in Business Administration at Open University of Tanzania.

The researcher wishes to assure you that the information so obtain will solely be used for the purpose intended. Your cooperation is highly appreciated.

You are kindly asked to fill in the questionnaire. Your answers and all information received will be treated as confidential. Upon publication of the material will be referred to anonymously, and no information can be traced back to a single individual.

Thank you in advance for taking part in this exercise.

Section A.

Department …….

Designation …….

4. What is your gender?

Male	Female

5. Select your age group.

18-20 years	20-29 years	30-39 years	40-49 years	50 and above

6. Select your highest academic or professional qualification? Select only one

Primary school	Secondary school	Advanced level secondary school	Diploma	Bachelor	Master/PGD	PHD

- Others (specify) _____

7. For how long, have you been working as a Traffic police or working at SUMATRA?

1 -3years	4-6 years	7-9 years	10 years and above

8. What is your current working position in Traffic police department or at SUMATRA?

SECTON B

9. a) The study wants to know the extent that human factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following variables have been human factors causing traffic accidents in Dar es Salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Younger Age					
Inexperience					
Excessive Speeding					
Sickness					
Tiredness/Sleeping					
Drinking alcohol					
Irresponsible behavior					
Wrong overtaking					
Lack of driving knowledge					
Not following road signs					
Drug usage					

Inadequate visibility					
Mobile phone usage while driving					
Non-use of seat belts					
Non-use of helmets					
Improperly overtaking or cutting in					

b. In your opinions what should be done in order to reduce human factor cause of traffic accidents in Dar es Salaam

_____
_____
_____
_____

10. a) The study wants to know the extent that climatic factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following climate factors variables have been causing traffic accidents in Dar es salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Rain					
Strong winds					
Road potholes					
Bumps and badly maintained roads					
Travelling in darkness					

b. What are the other climate factors that cause road traffic accidents in Dar es Salaam?

_____
_____
_____
_____

8. a) The study wants to know the extent that mechanical factors that cause traffic accidents in Dar es salaam. Therefore, you have been given response scale the way the following mechanical factors variables have been causing traffic accidents in Dar es salaam.

Variables	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly Agree (5)
Failure of the engine					
Break failures					
Age of the car					
Defective lights					
Dazzling lights					

b) What are the other mechanical factors that cause road traffic accidents in Dar es Salaam?

_____
_____
_____
_____

Appendix Iii: Interview Guide For The Sumatra Staffs

1. What are the most areas that are most likely for an accident to happen?
    a. Highway
    b. Within a city
2. Over the past year, most accidents have been happening at what time?
    a. Morning hours
    b. Afternoon hours
    c. Overnight
3. Over the past year what types of vehicles have been causing accident to a large extent?
    a. Commercial
    b. Private
    c. Motorbike
4. In your experience, what has been the most human causes of road accidents in Dar es Salaam?
5. In your experience, what has been the most climate causes of road accidents in Dar es Salaam?
6. In your experience, what has been the most mechanical causes of road accidents in Dar es Salaam?
7. In your suggestion what should be done to reduce accidents in Dar es Salaam?