ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ASSESMENT OF SAFETY MEASURES TOWARDES REDUCING ROAD ACCIDENTS IN SELECTED FUEL OIL COMPANIES

BY

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LIST OF ABBREVIATIONS

BAC	Blood alcohol Concentration
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HSE	Health Safety and Environment
WHO	World Health Organization
NRSP	National Road Safety Program
RTA	Road Transport Authority
AUC	African Union Countries
PM	Preventive Maintenance
ECM	Electrical Control Module
PPE	Personnel Protective Equipment
EPSE	Ethiopian Petroleum Supply Enterprise
OBC	On Board Computers.
AU	African Union
AUC	African Union countries.

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ABSTRACT

This study was conducted about the assessment of safety measures towards reducing road accidents in selected fuel oil supplying companies; Total Ethiopia Libya oil Ethiopia and NOC. For achieving the objectives of this study, 98 questionnaires were distributed for truck drivers and company staffs and 94 of them were successfully completed and analyzed using descriptive statistical analysis. The participants were selected using purposive sampling methods for drivers and senses method for company staffs. In addition, face-to-face interview were conducted with oil company transport managers, insurance company representatives, vehicle owners and road transport authority representatives through semi-structured interview questions and the questions were analyzed using descriptive narrations through concurrent triangulation approach. The study identified road accident leading factors; long service years of trucks, none experienced drivers, vehicles parked on highways, inadequate road signage's, drivers fatigue, low educational level of drivers are the major challenges which seem to impede to reduce road accidents. Multinational oil companies face problems on their stock exchange market at home country because of road accidents which registered globally where they are operated. In line with the findings obtained recommendations to oil companies, respective governmental bodies (road transport authority) and insurance companies are forwarded. In addition, further investigation suggestions for other interested researchers have been forwarded.

Key Words: Road Accident, Oil companies, Safety Measures.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Road accidents could affect the overall economies of the country and human lives in significant manner for the last decades. In freight transport system, the cargo trucks and the fuel transporting trucks have tremendous contribution for the road accidents. The loss of lives, damage to property, pollution of the environment and the sorrow it leaves in human mind are the end results of the event.

Nowadays, road traffic safety has received insufficient attention at the national and regional levels. Besides, the road accident fatalities exhibited the second high killer in the country following HIV/AIDS and Ethiopia ranks 12 accidents in the world (WHO, 2011).According to the government report, 70 people die in every 10,000 vehicles accidents annually. However, the average fatality rate is 60 people per 10,000 vehicles across sub Saharan African countries

The country's energy consumption has been dependent on fuel. Therefore, sufficient amount of fuel should be transported from Djibouti and Sudan to all over the country by long vehicles in continuous basis. However, the trucks face accidents similar to other light duty vehicles such as collision, turnover or hitting humans and animals on their travel. The difference on dry cargo and fuel/oil transport trucks is that fuel transport trucks are loaded with highly flammable products. Thus, during collision or turn-over the loaded fuel could cause fire due to friction and it is difficult to control easily. Moreover, once the fire explodes, the equipment will be at a total loss and most of the time human fatalities were exhibited (Department of transport and main road management 2011).

Total Ethiopia Share Company is one of the largest multinational fuel supply companies in Ethiopia since 1950 G.C. The company supplies all petroleum products such as gas oil, diesel fuel, LPG (liquefied petroleum gas) jetA-1 for aircrafts, lubricants and other company products. Such products are imported from Djibouti port and Sudan using Bridger's (tanker) for fuels and trucks for lubricants (from company annual report document 2013). Similarly, Libya Oil Ethiopia and NOC are suppliers of petroleum products to the country with the lions share among others who are engaged in this business (RTA 2013)

Total Ethiopia Share Company uses more than 420 Bridger's with an agreement made by transporters to supply the products in its 187 stations throughout the country and for its 3 stations; Bole Bahirdar and Mekele aviation depots for aircrafts. Therefore, it has faced road accidents for several times in the operation and a number of efforts have been done to reduce those unwanted events by the management. Nevertheless, frequent accidents including fatalities exhibited in its operation. Moreover, after the rollover of the fuel loaded vehicles, the fuel will rush out from the cistern and could pollute the environment (Annual company repot 2013)

There are a number of actions that have been done by the companies to minimize incidents/accidents on the road. Availing defensive driving training to the drivers, controlling vehicles technical conditions, enforcing speed limits and eliminating night driving were the primary issues and fixing of on board computers and road surveys were used for controlling measures(Total Ethiopia safety manual 2013). Total Ethiopia and Libya oil Ethiopia installs on board computers and GPS (Ground positioning system) connection to control road trucks for safety reason. Thus, it helps to control the rule compliances on the road.

Besides, all those efforts which have been done by the management; road accidents are creating challenging situation to the firm. The reasons to reduce or totally eliminate the event are that the social commitments by oil companies, the financial and non financial impacts on oil companies and on all stakeholders such as insurance companies, drivers transporters and the government. Therefore, oil companies especially Total Ethiopia has planned to reduce the incident/accidents with zero fatalities (IBID)

The purpose of this research is to elaborate the efforts which are done by the companies and to identify the strength and weaknesses of oil companies towards mitigating road accidents. Moreover, the paper tries to contribute and forward to beneficiaries some other recommendations after assessing all the gaps.

1.2 Statement of the Problem

The costs of fatalities and injuries due to road traffic accident have a tremendous impact on societal wellbeing and socio economic development. For instance, in the year 2011, 1800 people died which has the death rate of 136 people per 10,000 vehicles and it costs a damage of 400 million birr in the period (Central Statistics Agency, 2011). From this huge number of death and financial lose, cargo trucks and Bridger's are taking the largest share for the occurrence of the accidents.

The fuel/oil transporting Bridger's and trucks have considerable share of road accidents. In most cases the event ends with fatalities and high environment pollution. Nowadays, environment issues are becoming issues of global threats which are a challenge for managers who are working in petroleum companies. From this perspective, the fuel companies should have to play the necessary roles in taking safety measures to reduce road accidents.

According to Atubi, (2012), the impacts of the accident cause significant financial crises on the companies and high premium for insurance coverage. Similarly, insurance companies are exposed for huge expense to cover the total loses of trucks and the products as well as fatalities. Drivers may become disabled or they may lose of their lives by the accident. Their families could face problems even severely if they lost their husband, father, brother etc... Therefore, a single accident could affect different parties who are directly or indirectly benefiting from the firm.

Fuelling companies supply petroleum products from ports to different parts of the country. However, the road accidents have a tremendous impact on the transportation process. Therefore, a number of actions have been taken by managers and subordinates to prevent those unwanted events. Besides, all the efforts, accidents have been exhibited in different places and in different time.

Multinational oil companies impose some rules such as avoiding night driving, wearing safety belts, and fixing speed limits and not to drive after using alcohol to minimize road accidents. Apart from those rules, the controlling methods are assisted with the new technology; on board computers with GPS connection. However, accidents are still occurring on the road, fatalities are being exhibited and products are spilled onto the environment. Therefore, the study has the objective of assessing the company's efforts and the gaps which should be mitigated by the stockholders.

1.3 Research Questions

There are a number of factors for the occurrence of road accidents in oil companies. The companies are trying to mitigate the problems in proactive and reactive levels. However, the predetermined results are not achieved because of different reasons. Therefore, the purpose of

the study is assessing the practices and finding the challenges of fuel oil supplying companies based on the basic questions indicated here under.

- What are the strength and weaknesses of oil supplying companies towards safety measures in mitigating road accidents?
- To what extent did road accidents affect fuelling companies and other stakeholders in financial and non financial terms?
- To what extent did the management take proactive and reactive safety measures to mitigate road accidents in fuel oil transportation system?

1.4 Objectives of the Study

The study encompasses general objective and specific objectives.

1.4.1 General Objective

- The main objective of this study is to assess the efforts towards reducing road accidents in fuel oil transport companies and the challenges of management in fuel oil supplying system. Thus, it identifies the gap and forwards the possible mitigation measure.

1.4.2 Specific Objectives

The specific objectives of the research attempts to achieve are:

- Evaluates the strength and weaknesses of the companies which have been taken by the management to mitigate the road accidents on fuel/oil transporting vehicles and drivers.
- Assess the financial and none financial costs incurred to the fuel companies and stakeholders such as the insurance companies and vehicle owners.
- Identifies the proactive and reactive safety measures taken by stockholders to control the malfunctions during the transport operations.
- Examines the threats of the country in controlling road vehicles towards protecting road accidents.

1.5 Definitions of Terms

It is important to provide operational definitions of terms or concepts used in this research to create better understanding about the usage of these terms and phrases. The definitions of

Accident, Environmental pollution, Bridger's GPS and onboard computers will be interpreted as follows:-

Incident: an individual occurrence or an event, a direct piece of action or an episode, as in story or play (Oxford Advanced learner's Dictionary 1997).

Environment pollution: is any discharge of materials or energy into water, land or air that causes or may causes acute (short- term) or chronic (long-term) detriment to the Earth's ecological balance or that lowers the quality of life (Corbo P, et al., 2007)

GPS: (Ground positioning system) is a satellite base system that uses a constellation of 24 sate lights to give a user an accurate position. The technology was introduced by the USA for military purpose. However, it has been used for civilians all over the world to locate the position of equipments with different features (Leica 1999).

On-board computers: this equipment is installed in vehicles which uses different sensors such as oxygen sensor, air pressure sensor, air temperature sensor etc…Moreover fuelling companies use the apparatus for speed limit, harsh break and free-wheeling which have greater impact on turnover or any incidents/accidents.

Bridger's: fuel transporting trucks which are equipped with tankers to transport petroleum products.

Refueller: a truck with aircraft fuelling equipments which are dedicated only to transport and deliver for aircraft.

1.6 Significance of the Study

It is expected that the results of this research will have the following importances.

- It helps the management to know their weakness and strength related to safety measures against road accidents. The management could demonstrate the policies and procedures from reactive to proactive measures to mitigate the weaknesses which will be identified through findings and conceptualized on strengths.

- Transporters could be benefited from the study which forwards recommendations to mitigate road accidents. Vehicle owners being paid from insurance companies for the

damages of equipments and for the spilled product. Even though, they are not paid for the business that they will lose until their truck is repaired and gets back to operation. Moreover, there are a lot of unforeseen expenses which are not covered by the insurances, such as government taxes, losses of the current business (profit) ,recruiting new driver are some of the drawbacks for the owners. Drivers and their relatives may suffer from accidents where fatalities or sever injuries are exhibited. Therefore, eliminating those unwanted events makes them beneficiary.

- Currently, insurance companies have incurred huge costs from accidents. The costs of equipments, fatalities and product spillage are loses for those companies. Even though, they didn't have contribution towards safety on the road by availing training to drivers and vehicle owners or imposing the government to have stringent rules to mitigate the road accidents. Therefore, this study could help for those companies to plane for controlling of accidents which obviously reduces their expenses.

- It highlights to the government institutions for the need to use uniform standards through policies and procedures. Currently, some of the fuel oil supply companies use advanced technology such as GPS and on board computers to control their fleet management. However, it should be a requirement for those companies who are not on the same line. Therefore, the government may impose such technology for all road users since it helps to reduce road accidents.

- It may give a chance for others to make further studies to those who are interested on similar issues towards reducing road accident.

1.7 Scope of the Study

This paper tries to elaborate management efforts to mitigate the road accidents on fuel transporting trucks and how to reduce those unwanted events by stakeholders and others who are directly or indirectly affected by the situation. The study area is limited within three fuel supply companies (Total Ethiopia Share Company, Libya oil Ethiopia and NOC). There are 1,275 drivers in all companies. Moreover, 22 staffs that have direct relations with transport system are included for the study. Interview has been conducted to oil company's division managers, road transport authority, and insurance company representatives. Secondary data are

collected within the companies and other organizations that help to alleviate the problems and inhibit the proper implementation of safety measures in all companies which are subjected to the study.

1.8 Organization of the study

As Saunders et al, (2009) implies the structure of the final research report includes abstract, introduction, literature review, methods, results, discussion, conclusions, references and appendixes from this perspective the study comprise abstract and five chapters. Chapter one is the introductory part which contains background of the study, statement of the problem, basic research questions, objectives (general and specific objectives) of the study, significance of the study, delimitation, and definition of terms. Chapter two implies the general overview of road accidents and practices in national and international trends. The research design, sample and sampling techniques, types and sources of data, data gathering instruments, the procedures of data collection and method of data analysis included in chapter three, whiles data analysis presented in chapter four. The last chapter (chapter five) elaborates summary conclusion and recommendations.

CHAPTER TWO

Review of Related Literature

2.1. Introduction

This chapter reveals the national and international accident experiences and the main causes of accidents. The previous year's accident records of the country elaborated in detail. Moreover, the causes of road accidents from different literatures analyzed and the country's situation in relation to other African countries. Stakeholders' financial and none financial coasts discussed in the chapter.

2.2 Definition and causes of road accident

The Oxford Advanced learner's Dictionary (1997) defines accident as unpleasant event, especially in a vehicle that happens unexpectedly and causes injury or damages a car/road traffic accident. Similarly, in related literatures; road accident is caused by one or more vehicle crashes because of different factors (Hiemer, 2005). These definitions reveal that an accident is unwanted event; and its final outcome will be equipment damage, injuries or fatalities.

According to Pines, (2010), most accidents are not accidents at all. They are collisions that could and should have been avoided. Getting into a car accident can lead to several unwanted consequences, including fatalities, permanent disabilities, loss of earnings, etc...While some of the car accident causes may seem obvious and redundant from the teenage driver who just got their license, to the senior driver with 40 years experience behind. Learning to drive a car takes many instructional hours behind the wheel, especially if that driver wants to avoid causing car accident.

Atubi (2012) reviles that motor vehicle crashes are complex events which involve by two or more vehicles. The elements that influence the occurrence of a crash may take place hours, days, or months before the crash which include signaling, and weather conditions. In addition, other elements such as a decision to turn in traffic, a tire blowout, or slippery road may take place immediately before a crash; and crash reconstruction experts rarely concluded that crashes are the result of a single factor (Blanchard et. al., 2004).

Reports from the second African road safety conference declares that road traffic crashes are one of the leading causes of the death of more than 1.2 million people every year around the

world and Sixty-five percent of deaths involve pedestrians. Among the pedestrians' deaths, 35 percent represent children. The report also indicates that over 30 to 50 million people are injured and disabled each year and the trauma imposes a decline 1 to 3 % of GDP of the developing countries, (Abdallah, 2011).

Fatigue, drinking alcohol, and speeding are generally accepted motor vehicle crashes occurring in all countries. In addition, the technical condition of vehicle and environmental factors can lead to increase the occurrence of the risk. In this regard, (David et al., 2005) declares, lorries were more likely to be involved in fatal collisions due to the factors such as fatigue, speed and time pressure. In Ethiopian context, there are some additional factors such as "chat" and "shisha'' that may cause accidents on road vehicles.

Even though determinants of road traffic accidents have become a major public health concern, many developing countries have made very little progress toward addressing the problems related to motor vehicle crashes (Tulu, 2013). Ethiopia is one of the countries who scored a number of accidents in yearly bases and the government also plans a number of strategies to minimize the unwanted events. However, the trend shows that road accident significantly increases from year to year.

2.3 Road Traffic Accidents in Ethiopian Context

According to the report by the United Nations Economic Commission for Africa (2009) Ethiopia is one of the African countries with least vehicle-ownership. Besides, the country is the one which scored a number of accidents.

Table 1: Number of Motor Vehicles per 1000 People

	Ethiopia	Uganda	Kenya	Ghana	Nigeria	Botswana	South Africa
Density km/1,000km2 in 2001	4	8	13	58	65	10	60
Motor vehicles(per1,000 people) in2009	4	8	23	30	31	133	162

World Bank report (2012). Motor vehicles (per 1,000 people) on selected African countries

As it is shown in the table above Ethiopia has the least number of motor vehicles as compared to neighboring African countries such as Uganda and Kenya. However, a greater numbers of accidents were exhibited for the last decade in the country.

The Central Statistics Agency report (2011) reveals that, from 2001 to 2011, the road traffic accidents in Ethiopia has shown not in declining trend. The details are indicated here under:

Table 2: Road Traffic Accidents in Ethiopia 2001-2010.

No	Year	No of Traffic accidents	Series injuries	Total Fatalities
1	2001/2002	12423	2888	1813
2	2002/2003	14228	2904	2111
3	2003/2004	16976	3635	2176
4	2004/2005	17,722	3986	2517
5	2005/2006	18,911	4520	2517
6	200602007	17,147	4,423	2161
7	2007/2008	15,086	3,368	2616
8	2008/2009	3,568	1054	2085
9	2009/2010	3,568	1054	2541
10	2010/2011	15,884	2,501	3117
	Total	135,513	30,333	23,654

Source: Central Statistics Agency 2011.

The data shows that within ten years period 23,654 peoples died due to motor vehicle accidents. Therefore, this critical problem requires curious attention by respective bodies in order to alleviate the problem. By considering the seriousness of the problem the government has planned to reduce the death rate 40 persons per ten thousand vehicles, (Federal police report, 2011). However, the number of fatalities in 2011 was 3,117 which were 74 persons per 10,000 vehicles.

Furthermore, the fatalities were exhibited in all models of vehicles. However, trucks have significant amount as compared to other types of vehicle (Getu, 2007). The details of the accidents occurred in 2005 is indicated as follows:

Table 3: Road Accidents per Types of Vehicles

Types of vehicles	No of inspected &registered		Fatal accidents		Total accidents	Risk per 100 vehicles	%age involvement
	Number	**%age**	**Number**	**%age**			
Car	71,672	43	362	20	6,786	9	38
Taxi	14,504	9	259	14	2,707	19	15
Bus	14,152	9	204	11	2,373	17	13
Trucks	61,710	37	859	48	5,363	9	30
Others	4,271	2	117	7	493	12	4
Total	166,309	100	1801	100	17,722	11	100

Source: Federal Police Commission (2005)

As it is indicated in the above table, the trucks exhibit 859 (48%) fatal accidents compared with the total fatalities.

2.4 The Need for Energy and challenges

Since Ethiopia is a land locked country; all petroleum products are imported from abroad using the road transport system. The distance between Djibouti port and Sudan is far from Addis Ababa. Thus, it needs several days to transport the products to the capital and to different parts of the country. Infrastructures such as rail transport and hydrant systems are not constructed yet. Therefore, the country is highly dependent on road transport.

According to Ethiopian Economic Association annual report, (2012) consumption of fuel has been increasing from time to time. The share for the consumption of the transport sector from the total fuel import was 91.2 percent in 1997/98 but it increased to 95.6 percent in 2010/11. Road transport took about two thirds of the share while the balance went to air transport. The fact that less than 5 percent of the total imported fuel went to other sectors which shows the high dependence of the non transport sectors on non fuel sources of energy such as hydro electric power. In every aspect the country is highly dependent on fuel energy with fully dependent road transport system and it is obvious that accidents have been occurring on those long travels with different factors (Ethiopian Economic Association annual report, IBID).

The fuel/oil transporting vehicles are operating on up-countries and in the city since, the product have been imported from abroad, Djibouti and Sudan with the distance from Addis Ababa 925km and 1480 km respectively. The Bridger's have faced challenges because of different road environmental conditions which include weather conditions, road conditions and light conditions. In addition, the road users such as pedestrians and animals could cause

accidents in the process. The following table shows that road accident on fuel/oil transport trucks that are operating by Total Ethiopia S.C.

Table 4: Causes of Accidents on Road Vehicles

NO	TRANSPORTER	EQUIPMENT TYPE	MAJORE CAOSE	CIRCUMS-TANCES	Spilled Product in litters
1	Arenguadegorf	Truck-Trailer	Driver behavior	pedestrian hand is crushed	0
2	Actros	Truck-Trailer	Equipment	Fatality	39709
3	Vision	Truck-Trailer	Third party action	Trailer turned over	7345
4	Dagi	Truck-Trailer	driver behavior	Trailer turned over	21000
5	Seid Yasin	Truck-Trailer	Third party action	Trailer turned over	18632
6	Arenguadegorf	Truck-Trailer	Third party action	Trailer turned over	22820

Source: Total Ethiopia S.C Annual Accident Report 2012.

As shown in the table above, accidents could happen because of several reasons such as driver's behavior, equipment condition and third party contribution which could be pedestrians or animals. The consequences of such events will be fatalities, sever injuries, and equipment damage with product losses. Therefore, the victim of the accident is not only the person who is subjected to death or the person, who is severely injured, but the driver, the truck owner, the fuel oil company, insurance company, the environment and the society at large.

Panda, et al., (2012) illustrates that hydrocarbon which escapes during accidents could easily enter to the soil and air. In such cases the ground water and underground water became contaminated and can result in fatalities of the flora and fauna by its toxicity. Similarly, hydrocarbons causes' health problem to humans if injected and because of this, any contamination will have to be removed from potable water (Mitchell, 2012).

2.5 Causes of Road Accidents

Rovira et al., (2010) reviles that road accidents appear to occur regularly at some flash points such as where there are sharp bends, deep holes and at bad sections of the highways. At such points over speeding drivers usually find it difficult to control their vehicles, which then result

to fatal traffic accidents, especially during the night operation. However, the causes of road traffic accidents have been categorized into three groups (Tesema, et al., 2005).

1, the driver Behavior

2, the road and the environment

3, the vehicle

2.5.1 Drivers Behavior

Humans tend to blame someone or something else when an accident occurs. In most cases drivers tend to shift that the event occurred by the errors made by someone who was driving other vehicles, a pedestrian who was crossing the road or the technical conditions of their vehicles. It is very seldom to get someone who admits the event as his/her fault. A recent European study concluded that 80% of the drivers involved in motor vehicle accidents believed that the other party has contributed something for the accident to take place could have done something to take place the accident. A miniscule 5% admitted that they were the only ones at fault; the remaining 15%, reason out differently. Surveys consistently reveal that the majority consider that they are more skillful and safer than the average driver (Department of transport and main road management 2011). Some mistakes occur when a driver becomes distracted, perhaps by a cell phone call or a spilled cup of coffee (Tyler and Francis, 2012)

Different literatures unanimously agreed that drivers have the lions share for the contribution of road accidents. From the study, Drivers contribution is 93%; the road environment and vehicles technical condition 3.7% and 2.3% respectively (Getu, 2007). Drivers could cause accidents by the following factors:

A. Speeding

Many drivers ignore the speed limit and drive 10, 20 and sometimes 30 km/h over the limit. Speed kills, and traveling above the speed limit is an easy way to cause a car accident. The faster one can drive, the slower his reaction time will be if he needs to prevent an auto accident (Marc 2000). Similarly, a 10% increase in average speed would lead to a direct increase of 11.1% in the number of personal injury accidents. The impact is even greater on fatal accidents (an increase of 18.4%), which confirms that speed is an exacerbating factor for fatalities (Blume, et al.,2000).

B. Drunk Driving

When driver uses drink alcohol, he/she could lose the ability to focus and function properly and it's very dangerous while driving a vehicle. Driving under the influence of alcohol causes car accidents every day. Drunk driving is one the top causes that can be avoided.

Michael, et al. (2006) elaborates(about drunk driving) that perception and motor skills are impaired by a blood alcohol concentration of as low as .5ml/mg which are typically two or three drinks for an average adult. Although drivers with blood alcohol concentrations of 1.5ml/mg and above are much more likely to be involved in serious or fatal traffic crashes. Drivers with lower concentrations remain at a substantial risk for less serious crashes. In the Ethiopian context peoples don't need to have 0.8ml/mg. However Total Ethiopia imposes alcohol content should be less than 0.5ml/mg which will be about 2 bottles of beer expecting 0.2 ml/mg alcohol in each bottle.

C. Night Driving

According to Owen, (2013) driving in the daylight can be hazardous, but driving at night nearly doubles the risk of the occurrence of a car accident. When you can't see what's up a head of you, you don't know what to anticipate as you drive towards it.

In Ethiopia road context, night driving is rather difficult in up country roads. Vehicle lights are designed differently from one manufacturer to the other manufacturer. Some of the recently manufactured vehicles are equipped with high luminance lights which are difficult to see by drivers who are driving in opposite directions. Similarly, drivers may use high beams instead of low beams highly affect other drivers visibility. Such conditions could create serious accidents on the road.

Both, vehicle forward lighting and road lighting are designed to make what is ahead visible to the driver. The most suitable measure to determine whether or not an object ahead of the driver will be visible is its luminance contrast. The luminance contrast of an object will depend on the illuminants and reflection properties of the object and the surfaces against which it is seen (Tyler and Francis, 2009).

D. Fatigue

According to the royal society for the prevention of accidents (2011) fatigue is often ranked as a major factor in causing road crashes; although its contribution to individual cases is hard to measure and is often not reported as a cause of crash. Driver fatigue is particularly dangerous because one of the symptoms is decreased ability to judge our own level of tiredness.

Department of transport and main road management (2011) declares that drivers who don't get enough sleep may be subjected to road accidents because of fatigue. Estimates suggest that fatigue is a factor in up to 30% of fatal crashes and 15% of serious injury crashes**.** Fatigue also contributes to approximately 25% of insurance losses. Research has shown that not sleeping for more than 17 hours has an effect on driving ability the same as a Blood Alcohol Concentration (BAC) of 0.05**.** Not sleeping for 24 hours has the same effect of having a BAC of 0.10**,** double the legal limit (Department of transport and main road management IBID)

Studies by (Frith 1994) reveals that higher fatigue accident rates has been registered for drivers who drove for longer than 9.5 hours per day without rest, driving at night, driving in remote areas. Such conditions could create a cumulative effect on fatigue related truck accident.

E. Age Deference's Regarding Road Accidents

Some people are better equipped to deal with the demands of driving than others. Among the important factors that determine a driver's ability are the amount of practice and any limitations in visual or cognitive systems. The influence of these factors can be seen in the number of fatal and personal injury accidents per 100 million miles travelled by day and night, for different age groups (Tyler and Francis, 2009). The highest accident rate of both types occurs for drivers at the extremes of the age range, the youngest and the oldest. However, the types of accidents associated with the extremes of age are different. Young drivers tend to be responsible for more accidents where lack of control, following too close, misjudging stopping distance, avoiding an object/ person/vehicle, speeding, or improper passing are the primary contributory factors. On the other hand, older drivers tended to be responsible for more crashes where failure to yield right of way, failure to see an object/person/vehicle, failure to heed a sign or signal, an improper lane change, an improper U-turn, or improper backing are the primary contributory factors (Tyler and Francis IBID).

2.5.2 Weather Condition

According to Sarah Copsey (2010) the risk of accidents increases when trucks travel under hazardous conditions. Rain, sleet and snow can cause slippery roads. Heavy rain or snow as well as heavy fog can limit visibility for the drivers. A number of factors are known to affect visibility of drivers: especially fog intensity, but also droplet size, blowing snow, wiper speed, ambient light and splash and spray from other vehicles (Rovira, 2010)

Elevated risk during rainfall appears to be related to visibility, since collision rates quickly return to near-normal after the rain has stopped, even if roads continue to be wet. Snowfall-related risk often remains elevated for an extended period, suggesting that frictional effects dominate. High winds and fog are associated with a small proportion of crashes but generally increase the risk of a traffic collision, whether acting alone or in combination with precipitation (Marc Gaudry and Sylvian Lassarre 2000)

2.5.3 Vehicle Conditions and Lack of Preventive Maintenance

Preventive maintenance is crucial for vehicles which operate on the road. Some parts shall be checked periodically and others should check less frequently (Crouse 1983).However, most of the vehicle owners stick for breakdown maintenance. In contrary, vehicle manufacturers insists that preventive maintenance shall takes place in accordance with the vehicle operating manuals schedules; to reduce the wear and tear of the parts (Douglas,2007), Bad road condition could leads to premature wear on vehicle parts, tires may blow out while driving at maximum speed which leads to turn-over. Breaks may fail while driving at downhill, which causes collusion, etc…Therefore vehicles technical condition could have an impact on the road accidents.

In Ethiopian context most of road transport trucks are aged more than 10 years and the maintenance system relays on break-down maintenance. The reason is that vehicle owners don't have awareness of the benefits of preventive maintenance and drivers have been forced to use the truck with its defects which may lead them to accidents.

2.6 Stakeholders and Their Efforts towards Reducing the Event

According to Hiemer and Marcus (2005) road accident could affect the country economy extensively since the accident costs huge money and human lives. The following stake holders

are directly affected by the accident because of their business related with petroleum supply system (IBID)

1. Drivers.
2. Transporters (vehicle owners).
3. Fuel oil companies.
4. Insurance companies.
5. The Government.

A. Drivers

The annual road safety week report shows that drivers are in the front lines of road accidents; 81% of fatalities are caused by driver errors, 5%, vehicle error, 4% pedestrians, 10% road and others (Asrat 2006).From this perspective, drivers cause accidents in tremendous level. However, they may die from the event or they may be sentenced by the court for several years in jail which has an economical impact on their family and relatives.

Drivers in any types of business could have fatigues. But, drivers who operate on fuel oil transport vehicles are exposed for more fatigues because of the nature of the operation. Most of the journey includes low land areas with high temperature which makes drivers somehow tired. Moreover, drivers who are employed for non-governmental organizations may don't have annual leaves, or sufficient day-offs which could create inconvenience and fatigue in their operation. Therefore, fatigue is more likely to be a factor for crashes in rural areas as they can involved in long trips and extensive periods of continuous driving (Frith 1994).

B. Transporters

Transporters in Ethiopian context operate their trucks by recruiting drivers and their economical competency varies from one truck to a number of fleets. In most cases, they don't want to stop their vehicles from the trip. The reason is they don't to lose their incomes. However, vehicles should be subjected for preventive maintenance. When accidents occurred on their equipments, they may claim to insurance for the damage. However, it is known that, there are unforeseen costs such as the time that the vehicle is out of operation, and the salary which is paid to the driver and others who are recruited for the job are not covered by the insurance companies. Therefore transporters are victims of accidents (Asrat 2006).

C. Fuel oil companies

There are nine fuel oil companies in Ethiopia; four of them are local companies and five of them are multinational companies (RTA 2013). The products are belonging to fuel oil companies. Most of the time, products have spilled out while accidents occur on vehicles. The cost of the spilled quantity may be covered by the transporter through insurance companies. Even though, the spilled product could pollute the environment which could be the responsibilities of the fuelling companies. The fuelling companies are responsible for fatalities and injuries since they are socially committed for the well being of the society. Moreover, multinational companies affected by fatalities for their stock exchange which takes place in their headquarters that no one wants to buy the share that operates with fatalities. Thus, the price for each share goes down in significant manner (IBID).

Therefore, some of the fuel supply companies have policies for speed regulations to mitigate the road accident. Total Ethiopia share company has a regulation to all speeding above 80km/h are recorded using on board computers. Sanctions are requested to transporters for violations above 80km/h for the duration above 30s, if it practiced twice in a day and for any violation above 85km/h up to mid April 2013. However, the speed limit for fuel transporting truck operators have been reduced to 74km/hr since mid April 2013, and sanctions are requested for transporters where any violations are exhibited by the drivers. Even though, accidents are caused because of other road condition or third party contribution (Total Ethiopia annual report 2013).

D. Insurance Companies

Transporters are charged premium for their equipment and for the products by the insurance companies. Insurance companies pay for the damage to transporters if there is any throughout the year. Insurance companies paid, 1,243,170,000 birr and 1,528,333,000 birr for motor vehicles accidents in the year 2012 and 2013 respectively (National Bank of Ethiopia report 2013). Besides, covering for the damages, insurance companies' contributions toward proactive measures are found not inactive.

E. The Government

The Federal Police Commission annual report (2011) indicates that government launches strategy to reduce the fatality 40 people per ten thousand vehicles. However, the data shows that the accident rate is 74 peoples per ten thousand vehicles. Government has to be expected to launch policies and procedures with enforcements to reduce road accidents. Some of the fuel oil companies use technologies such as on board computers to control the speed limit and prohibits night driving. However, government should enforce related rules and regulations for all companies since they are operating on the same road.

Government strategies, such as strict control of traffic rules and penalties may help to reduce the accidents in cities and some towns. However, long vehicles are operated in high-ways of up-country, rather difficult to control by traffic police men who are working in the urban areas. Therefore, some sort of technology should be fixed on the trucks to check and control the ethical operation which helps to reduce any unwanted episodes.

Apart the government strategies, Total Ethiopia and Libya oil has done a lot on road accidents by their fleet management. Availing frequent defensive driving training to operators, avoiding night driving and fixing on board computers are some of the measures taken by the companies.

2.7 Conferences to Mitigate Road Accidents

There were a number of conferences held in the capital (Addis Ababa) to mitigate road accidents in Africa. One of the conferences made on November09, 2011 with the participation of different organizations and African countries representatives. The conference launches the "Steps to the Five Pillars of Road Safety". Officials from the Regional Economic Communities, governments, and road safety agencies in Africa; who are tasked with the responsibility of defining and implementing regional and country level road safety strategies. The overall objective of the workshop was to ensure the existence of a robust implementation pace among the key stakeholders and identifying gaps and opportunities for future collaboration (Sub-Saharan Africa Transport Policy Program 2012).

2.8 Strategies to Mitigate Road Accidents

Different scenarios from the government and fuel oil companies launch strategies to mitigate accidents. Government strategies focuses on improvements on drivers training testing and licensing, implementation of defensive driving training for professional drivers, implementation

of stringent vehicle testing procedure, stringent traffic low enforcement, are some of the strategies (Asrat road safety week conference 2006)

A. Training

The fuelling companies especially, Total Ethiopia and Libya oil Ethiopia have organizes defensive driving training to all road drivers with including their permanent employees who are driving aviation refuellers. The training enhances drivers with the skill how to drive defensively from possible accidents made by other parties such as vehicles which are driven in opposite direction or driving at the back and the available distance between two road vehicles. The training has made with the collaboration of road transport authority and it includes the rules and regulations of the country regarding driving on the road. Apart the in house trainings, drivers and operators have been mentoring by out sourced contractors and experts in the abroad respectively.

C. Avoiding Night Driving

Different literatures show that driving during night can cause road accidents by reducing all round visibilities to the driver (W J Frith, 1994).The condition may be much more sever in Ethiopian road condition and technical capabilities of long vehicles. Therefore, the companies should prohibit night driving to reduce those unwanted events and could be easily controlled by on board computers. Total Ethiopia has implemented rules that prohibit night driving. However, in the year 2012, 1,367km was covered by drivers during the night and penalized by the transporters for those who violet the rule and this could be considered as a good practice.

Driving at night in up-country highways has different challenges from other vehicles. The incoming vehicle may have high illuminant lights; drivers may in fatigue due to lack of sufficient rest and difficult to determine what type of vehicle is coming in front of us. Thus, night driving could cause road accidents.

CHAPTER THREE

Research Design and Methodology

3.1. Introduction

In this chapter the research design, the population used for sample and the sampling techniques are elaborated. Questioners designed to drivers and company staffs and in order to have the right picture on road vehicle accidents the researcher used different techniques. Thus, managers and transporters are brought to discussions in the form of interview. Similarly, insurance companies and road transport authority representatives are interviewed to get the right picture of the problem through dialogues.

3.2. Research Design

The purpose of the research is making an assessment on the implementation of safety measures and the evaluation of the outcomes using numerical and non numerical data. Therefore, descriptive research method is used to study the problem which helps to present and interpret the data collected on various dimensions of the road accidents. The study attempts to investigate the efforts on reducing road accidents on fuel/oil transport vehicles in selected oil supply companies.

3.3. Sample and Sampling Technique

According to Kothari (1990) Population is the total collection of elements about which one wishes to get information. From this perspective, population is the target group to be studied in a particular place while sample is a part of the population. Therefore, representative samples are used for the study from the total population. From the nature of the work, drivers move from one place to another. Hence, it is not easy for the researcher to involve all the target population in the study because of problems related to time and finance. Thus, it is believed that the researcher need not take the whole population as a result of a good representative samples have the same characteristics as the population as a whole (Zikmund, et.al 2009).

The population includes; fleet managers, safety health and environment managers (HSE), transporters, fuelling company staffs, truck drivers from the three fuel oil companies. In

addition to that, interview has been conducted for road transport authority and two insurance company representatives which enable to know the magnitude of the problem in the firm.

Stakeholders; who have contributory effect towards reducing road accidents

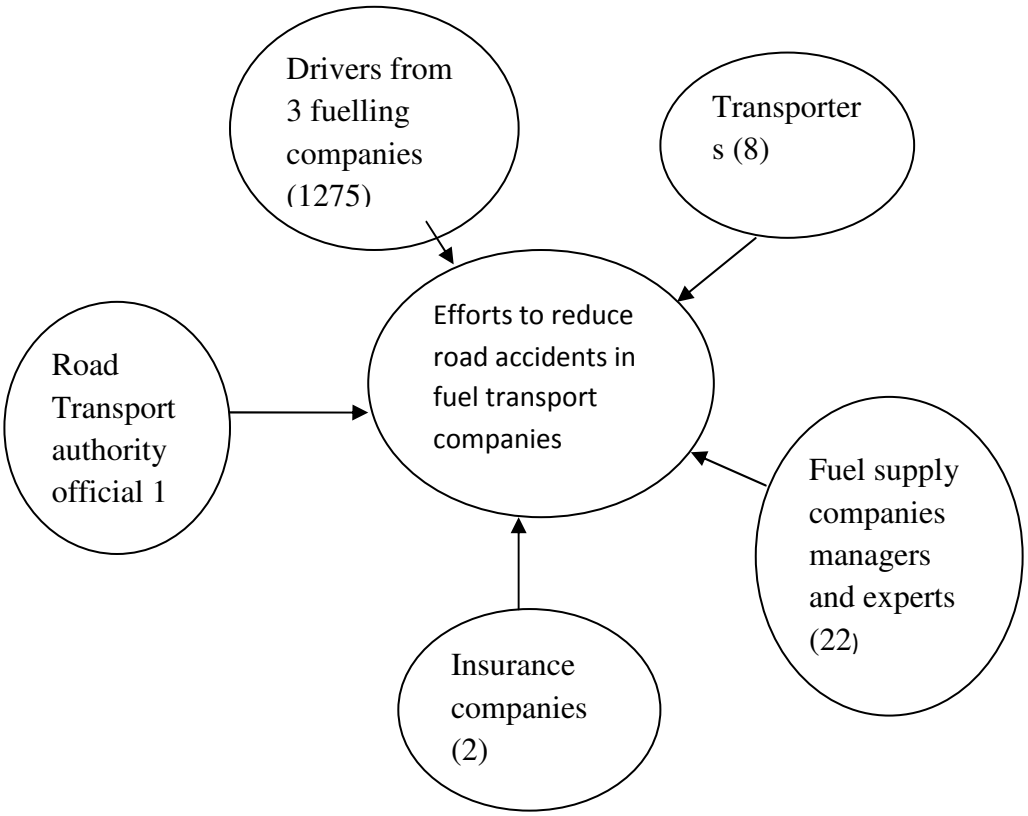

Fig1: stakeholders for transportation process

From the diagram, the target population of drivers is 1275. Therefore, the researcher uses purposive sampling method because of the nature of the work that drivers move from place to place and the method also give a chance for drivers who have experienced on accidents. From this perspective, the sample size for drivers has been calculated by assuming the level of confidence interval 95%. This is because of the fact that driver's duty is analogous. The degree of precision (sampling error) is $\pm$0.05 % and the coefficient of variation is $\pm$0.5% (Yamane 1967). Therefore, the sample size for drivers was determined by the following formula (Nasiurma 2000).

$$n = \frac{NC^2}{c^2+(N-1)e^2} = \frac{1275(.5^2)}{.5^2+(1275-1).05^2} = 94$$

Where: n=sample size

N=Population size (1275)

C=coefficient of variation (0.5)

e = level of precision (0.05)

The above formula has been used for drivers to draw samples. However, all managers, experts and other stakeholders are managed by Census method. The Census method is one approach to use the entire population as the sample which eliminates sampling errors (Israel, 1992).

3.4 Instruments of Data Gathering

The issues discussed in the review of literature and the research questions were used as a guideline for the development of questionnaire. The questionnaire that were designed, administered and used in the questionnaire are some open and more close ended (multiple choice and Likert scale type) questions. The type of scales used to measure the items on the questionnaire is continuous five scales ranging strongly agree to strongly disagree. This helps the researcher to gather quantitative data from drivers and company staffs.

The questionnaire were designed both in English and Amharic language which helps to create proper rapport and to gain better responses from the respondents of those who cannot clearly understand the English language. In addition, to enhance the willingness of the respondents to provide the information requested a pilot study was conducted to refine and make clear the questionnaire before administering. Besides, to make the study reliable and dependable semi-structured interview questions were designed to oil company transport managers, vehicle owner's insurance company and road transport authority representatives.

3.5. Types and sources of Data

According to Saunders et al., (2009) the use of two or more independent sources of data or data collection methods helps to confirm findings in the study. Therefore, the researcher employs both primary sources of data from sample respondents and secondary data from reports and documents. Open and close ended questionnaires have been designed and administered by the researcher to gather quantitative data from drivers, transporters and selected experts who are

working on GPS and on board computers. Similarly, to make the study reliable, semi - structured interview designed to fleet manager, HSE manager, road transport authority representatives and insurance company representatives. Thus, it helps to gather qualitative data

Secondary data is the data that has already been collected for purposes other than the problem at hand (Saunders et al.,2009).From this perspective, secondary data has been collected from stakeholders including the Federal police, statistics agencies, and National bank of Ethiopia that have stored data on road accidents. Moreover, the researcher assesses the recent conferences and practices from internet sources.

3.6. Methods of Data Analysis

According to Kothari (1990) data analysis takes place after the data has been collected. Analysis of data require a number of closely related operations such as estimation of categories, application of this categories to row data through coding ,tabulation and then drawing statistical inferences. Therefore, the study uses descriptive statistical tools such as; tables, figures and percentage to present data from both primary and secondary sources. Then the researcher used SPSS version 20 software which helps to process, analyze and tabulate the data that enables to provide frequency table along with percentage employed to analyze the responses of drivers and company staffs on those dimensions.

3.7.Reliability and Validity of Instruments

Reducing the possibility of getting the wrong answer is possible by evaluating the reliability and validity of data gathering instruments employed in the study.

3.7.1 .Reliability

Ensuring the reliability of the instrument is possible through testing; and the reliability of a standardized test is expressed as coefficients which vary between -1 and +1 with the former reveal perfect negative reliability and the latter reveals perfect positive reliability. The Cronbach's alpha value of 0.67 and above is acceptable and taken as a good indication of reliability (Sunders, et.al, 2009). In this research the likert scale questionnaires responded by oil companies drivers and staffs were tested with a sample of 23 drivers and the Cronbach's alpha coefficient is 0.94. Hence, the instrument can be taken as highly reliable to achieve its purposes.

3.7.2. Validity

The validity of data gathering instrument is confirmed by the ability and willingness of the respondents to provide the information requested. In order to make the questionnaires valid, relevant and objective to the problem; it was properly commented by the advisor, and it also tested on available respondents, and based on the issues which were not properly clear by the respondents were corrected and refined.

The designed questionnaires can help to identify the main challenges that affect to reduce road accidents so enables to address how these issues affect safety measures in the fuel oil transport system. Furthermore, the interviewed respondents can also confirm the validity of the questionnaires. Therefore, the improved questionnaires were printed, duplicated and dispatched.

3.8. Ethical Considerations

Regarding the right to privacy of the respondents, the study maintained the confidentiality of the identity of each participant. In all cases, names are kept confidential and collective names such as 'the respondents,' the participants, the interviewees etc., were used in the study. Moreover the research participants included in the study were informed about the purpose of the study and their willingness and agreement was respected before the beginning of filling the questionnaire.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter deals with data presentation, analysis and interpretation based on the data obtained using questionnaire and interviews. The analysis was made to answer the research questions concerning road accidents in fuel oil supply companies. Data was collected from drivers, who are currently operating in three fuel supply companies and company staffs who have direct contact with the transport system. The questionnaire was designed containing close ended and open ended items to give them a chance to explain the strengths and weaknesses of their companies regarding safety measures and prevalence of road accidents. Apart from the questionnaire, guided interview was conducted with managers and experts from pre-selected sectors.

4.2. Genera Backgrounds of Drivers

The questioner was distributed for 98 sampled drivers selected from three fuelling companies. After the collection, inventory has been made and 94 were successfully completed and returned yielding 96% response rate. Among these 33 from Total Ethiopia, 29 from Libya Oil Ethiopia and 32 drivers were from NOC, Furthermore, the questionnaire was distributed for 22 company staffs and all have been collected and analyzed. Similarly interviews were conducted with insurance company representatives, road transport authority personnel, transporters and fuelling company fleet manager. The collected data were analyzed with SPSS (Statistical Product Service Solution) version 20 and Microsoft excels which helps to calculate the percentage. The raw data has been analyzed and displayed in the tables.

Table 5: General Backgrounds of Drivers

NO	ITEM	Frequency	Percentage
1	**Age**		
	18-25 years	1	1.1
	26-30 years	3	3.2
	35 years	15	16.0
	36-40 years	32	34.0
	41-45 years	20	21.3
	46-50 year	14	4.9
	51 and above	9	9.3
	Total	**94**	100.0
2	**Sex Male**	**94**	100.0
3	**Education**		
		32	34.0
	Grade 1-8	56	59.6
	Grade 9-12	6	6.4
	Tech and diploma		
	Total	**94**	100.0
4	**Experience:**		
	2 years and below	8	8.5
	3-7years	19	20.2
	above 7 years	67	71.3
	Total	**94**	**100.0**
5	**Companies**		
	Total	33	35
	Oil Libya	29	31
	NOC	32	34
	Total	94	100.0
6	**Types of trucks**		
	Semi trailer	53	56.4
	Truck trailer	41	43.6
	Total	94	100.0

Source: Own source, May, 2014

From the above table item number1, driver with age category of 18-25 years old account 1.1% of the total respondents, and drivers of age 26 to 30 were 3.2% of the total respondents. The ages 31-35 account 16% and the age of 36- 40 years are 34% which is considered as transition period from yang age drivers to old age drivers. Drivers at the age of 41-45 are the second largest age category in the business which is 21.3% from the total respondents. At this stage drivers are more matured and have rich experiences about their vehicle and the road condition. Drivers at the age of 46-50 and above 51 are 14.2%.At these stage drivers have rich experience on the challenges. Besides, management complains that drivers at this age category have difficulties to accept the new methods of work procedures and technology.

As it is indicated in the above table, item 3, respondents from grade 1-8 were found 34%.In this category most of the drivers are at old age and have rich experiences. However, the interviewed managers confirmed that such drivers are not accustomed to new technology and have faced problems to read and understand the messages on their trucks dash boards. Grade 9-12 respondents are 59.6% which can be considered as the major working force in the sector. This enables them to have better understanding for the technology and the training provided by the companies. The rest 6.4% of the respondents have technical and vocational diploma, this helps to the fuel companies for their proactive measures on safety.

Regarding job experience, in the table item 4, 2 years and below are 8.5% of the total respondents and drivers with job experience 3-7 years are 20.2%.The rest above 7 years represented 71.3%. From this the researcher can deduce that most (71.3%) of cross boarder travel drivers have better experiences from the total respondents. Thus, it is expected that experienced drivers have much better skills and knowledge for the road challenges which helps to the business by reducing road accidents.

On item 5 of the same table, the samples taken were from the three fuel oil companies i.e, Total Ethiopia 35%, Libya Oil Ethiopia 31% and NOC 34%.This could help to examine the practice for training and awareness through questionnaires from each company.

On the above table item 6, equipment types are identified from the table that 56.4% are semitrailers and the remaining 44.6% are truck trailers which currently are operated by the respondents. The accident record shows that truck trailers have more accidents as compared to semitrailers. However, the sample indicates that there is a huge number (44.6%) of truck trailers operating in the fleet which has an adverse effect for proactive measures in road accidents.

4.3. Staff Background in Oil Companies

Company members from each supplier were selected for they direct relationship with transportation system such as inspection, truck assignment; training provider and safe to load controllers are participate through questioners.

Table 6 below shows the background of staff respondents selected from the three oil companies in terms of age, educational background and experience categories. As can be seen in item (1) from the table, out of 22 staff, 8 (36.4%) were at the age of 42-49 years which comprises the majority of the respondents. The second largest category counts 6 (27.3%) at the age of 33-41 years. Thus, the total staff age distribution in oil companies has well matured and energetic

work force in transport management areas. Moreover, staff at the age of 42-49 has got opportunities to investigate road accidents in the company which enhances them the skill how to mitigate the events.

Table 6: General Background of Company Staff.

No	Item	Frequency	Percent
1	**Age categories of respondents**		
	18-25	1	4.5
	26-32	3	13.6
	33-41	6	27.3
	42-49	8	36.4
	50 and above	4	18.2
	Total	22	100.0
2	**Company Distributions of Respondents**		
	Total	10	45.5
	Libya Oil	6	27.3
	NOC	6	27.3
			100.0
	Total	22	100
3	**Educational background of respondents**		
	9-12 grade	1	4.5
	TVET or Diploma	5	22.7
	First Degree	15	68.2
	Second degree and above	1	4.5
			100.0
	Total	**22**	**100**
4	**Work experience**		
	2years and below	1	4.5
	3-5 years	8	36.4
	6 and above	13	59.1
	Total	22	100.0

Source: Own source, May, 2014

In relation to respondents, company distribution from table item 2 above, 10 (45.5%) are selected from Total Ethiopia and the rest 12 (55.5%) are equally distributed for Oil Libya and NOC which was done by taking consideration of the total work force in each company. Moreover, the staff respondents involved in this study has better experience on road accidents since they are participating in the transport system in different work assignments

As we can be perceived from item 3 of table 6, most 16 (72.2%) of the respondents possess first degree and above which is 15 (68.2%) BSC/BA degree, and 1 (4.5%) respondent earns MSC degree. This indicates that oil companies have well educated working forces who are able to bring solutions towards reducing road accidents. Especially, multinational companies use foreign language on daily practices in their working premises and the good practices from abroad launch through emails. Thus, to interpret the safety bulletins; well educated labor force

is mandatory. From this perspective, the majority (72.25%) of respondents found capable to interpret safety measures and able to deliver to drivers through trainings.

The work experiences of respondents in the table 6, item 4 reveals that 13 (59.1%) respondents have worked above 6 years and 8 (36.4%) of respondents have 3-5 years of experiences in the business. From this perspective respondents may have a chance of participating in different accident investigations and the mitigation measures that have taken by the companies.

4.4. Working Conditions of Drivers and Road Safety

The general working conditions of drivers assessed through questionnaires both in close ended and open ended questions. Respondents have participated to emphasize their working conditions in broad. The following table summarizes the working conditions of drivers and the road safety.

Table 7: Working Condition Regarding Road Safety

No	ITEMS	Frequency	%
1	**The frequency of happening road accident on you or your friends might be because of:**		
	A. Poor maintenance of vehicle	9	9.6
	B. Long service years of the vehicle	11	11.7
	C. Road condition	7	7.4
	D. Third party contribution; Pedestrians, animals, etc...	5	5.3
	E. Weather condition	3	3.2
	F. vehicle under breakdown and parked on the road	25	26.6
	G. None experienced driver (especially drivers who hold the currently issued licenses)	34	36.2
	Total	94	100
2	**On board computers and GPS controlling system helps to reduce road accidents.**		
	• .Strongly disagree	6	6.4
	• Disagree	9	9.6
	• Neutral	1	1.1
	• Agree	41	43.6
	• Strongly agree	37	39.4
	Total	94	100
3	The vehicle that you operate has scheduled preventive maintenance program.		
	• Strongly disagree	8	8.5
	• Disagree	9	9.6
	• Neutral	3	3.2
	• Agree	46	48.9
	• Strongly agree	28	29.8
	Total	94	100
4	**The remuneration paid by transporters is enough to your livelihood.**		
	• Strongly disagree	40	42.6
	• Disagree	32	34.0
	• Neutral	4	4.3
	• Agree	8	8.5
	• Strongly agree	10	10.6
	Total	94	100
5	**Your employer allows you payable annual leave after working some months or a year**		
	• Strongly disagree	37	39.4
	• Disagree	30	31.9
	• Neutral	10	10.6
	• Agree	11	11.7
	• Strongly agree	6	6.4
	Total	94	100
6	**Have you ever face road accident before?**		
	• Yes	23	24.5
	• NO	71	75.5
	Total	94	100
7	**Periodic medical check-up helps to reduce road accidents.**		
	• Strongly disagree	4	4.3
	• Disagree	5	5.3
	• Neutral	44	46.8
	• Agree	41	43.6
	Strongly agree		
	Total	94	100
8	**The training which provided by the company is sufficient to protect yourself and others from road accident.**	2	2.1
	• Strongly disagree	10	10.6
	• Disagree	2	2.1
	• Neutral	35	37.2
	• Agree	45	47.9
	• Strongly agree		
	Total	94	100

Source: Own source, May, 2014

Respondents were asked about the most probable causes of road accident which could challenge them or their friends on the road. As indicated in the table above, item 1 36.2% of the respondents have a fear of accidents because of none experienced drivers. The open ended responses of the respondents show that currently issued licenses from the government could expose the driver and other road users to improper usage of the roads. They have also noted their idea that the holder of such license lacks experience of road condition and the vehicles characteristic while driving on the road. Among the respondents, 26.6% indicates that vehicles parked on highways for long cause's road accidents and ranked on second place followed by long service years of vehicles on the third place with 11.7%.

On board computers has been installed on vehicles as a requirement. Some multinational companies impose to have such a technology for better manipulation of safety on the road which helps to control speed limit and rest time for drivers. Besides, the useful feature some drivers assume that technology is used for only vehicle owners and fuelling companies to control drivers. From this perspective drivers requested about the useful features of the technology in item number 2.Therefore, 43.6% and 39.4% of respondents agree and strongly agree respectively with the useful features of the technology by providing information's for the operator; the service time of the vehicle and sirens while tending to drive over the limited speed. The interview strengthens about the technology by providing information's for the operator; the service time of the vehicle and sirens while tending to drive over the limited speed.

Preventive maintenance for vehicles is crucial to prevent road accidents. In the above table item3, drivers were requested to respond on the preventive maintenance of their vehicle and the acceptance by their owners for scheduled maintenance. In line with this, 48.9 % agree and 29.8% strongly agreed which shows that most of vehicle owners (78.7%) have awareness to use preventive maintenance for their vehicles. Thus, properly maintained vehicles are technically capable and are not subjected to accidents due to mechanical failures. From literatures poorly maintained vehicles could face road accidents. From the above data the researcher understands that the oil company's management provides knowledge about preventive maintenance to vehicle owners as a proactive measure.

In the above table item4, it is revealed that 42.6% and 34% strongly disagree and disagree about their remuneration respectively. From the data, 76.6% of the respondents indicated that drivers aren't satisfied with their salaries and per-dime that is paid for their work. The remaining 19.1%

(8.5% agree and 10.6% strongly agree) shows the satisfaction of the respondents. The rest, 4.3% of the respondents provide their neutral responses.

Different literatures ensure that one of the reasons for road accident is fatigue on drivers (Frith, 1994). In relation to this, in the above table item 5, 39.4% and 31.9% strongly disagree and disagree respectively shows that truck owners don't consider their drivers annual leave. The rest 10.6%, 11.7% and 6.4% provide their neutral, agree and strongly agree responses respectively. This reveals that most private owned vehicle drivers don't have an opportunity to get annual leaves with payments. The interviews reveal that drivers who raise such questions may be fired from their job. In such a case, oil fuel companies and the government should intervene to have an agreement between truck owners and drivers about annual leave.

Derivers were asked to respond on road accident occurrence in their previous life time from the operation. 24.5% of the respondents had accidents on the road and 75.5% didn't have accidents before. Even though the responses of the questionnaire are positive in response to the occurrence of the road accident, nearly one-fourth of the respondents confirmed they have experienced on accidents. The level of the accident is varying from severe injury to fatalities.

Driving to cross boarder countries needs healthy physical conditions. The job needs the well functioning of our body parts. In general, the physical condition of drivers is crucial to mitigate any accident/incidents. Therefore, drivers requested for whether they have check annual medical checks in authorized health centers or not. As shown in the above table 46.8% of the respondents agreed to have annual medical checkup. Similarly, 43.6% of the respondents strongly agreed with companies which are insisting for annual medical checkup. They also believe that it is important to check and have medication to avoid road accidents.

Fuel oil companies provide defensive driving training for drivers when there are new drivers and refresher training after some periods for all drivers who are travelling to cross borders. On the above table item8, 47.9% strongly agree and 37.2% agree to show that the training provided by the company toward reducing road accident is acceptable.

4.5 Efforts towards Reducing Road Accident

Oil companies are expected to work on reducing road accidents since they are socially responsible to the community. From this perspective companies' staffs were requested to respond for some safety measure taken by in their respective company management. In table 8

below, in item1 indicates that 36.4% responds strongly agree and 31.8% responds agree which implies that companies are trying to reduce the road accidents by creating awareness to drivers. On the contrary, 22.7% disagree and 4.5% strongly disagree which shows that the inadequacy of the awareness creation activities taken by the company to mitigate road accidents. The drivers have also witnessed that the training which is provided by the oil companies is useful to protect themselves and others from road accidents.

Table 8 item 2 below, shows the responses given by the staff about drivers attitude such as driving after taking alcohol could be changed through training or not. As it is shown 22.7% of respondents strongly agreed and 50.0% responds agreed that in order to change drivers' attitude training is crucial

Table 8: Staff Respondents about drivers training and fatigue

No	Items	Strongly disagree	Disagree	neutral	Agree	Strongly agree
1	The training which provided by your company is sufficient to protect drivers from road accident.	1	5	1	7	8
	%age	4.5	22.7	4.5	31.8	36.4
2	Driver's attitude such as driving after taking alcohol could be changed through training	0	4	2	11	5
	%age	0	18.2	9.1	50.0	22.7
3	Drivers imposed by the company to have a rest after driving a while.	0	1	5	7	9
	%age	0	4.5	22.7	31.8	40.9
4	Drivers use annual leave after working some months or a year.	1	9	3	3	6
	%age	4.5	40.9	13.6	13.6	27.3

Source: Own source, May, 2014

Item 3 in the above table implies drivers are imposed by the company to have a rest after driving a while. The result shows that40.9% of the respondents strongly agrees, 38.8% agree and a 22.7% remains neutral. Thus, it indicates companies encourage drivers to have rest after 4.30 hours of driving. Multinational companies have installed the on board computers to control for such rule compliances. However, locally owned companies shall adoubt the good practices from those multinational companies to have the technology.

To reduce the fatigue on drivers, in addition to road rest, annual leave is crucial. From this perspective the companies' staff was asked to respond whether drivers have annual leave with payment or not. As indicated above, table item 4, 40.9% of the respondents reply disagree which is almost similar to the driver's response and 4.5% of the respondents strongly disagree

with driver's annual leave. Others 13.6% responds both neutral and agrees. The rest 22.7 % implies strongly agree. Besides the staff response, driver's mentioned in open ended questions that there is no defined contract agreement between transporters and drivers. Therefore, if drivers request the annual leave with payment they may lose their jobs.

4.6. Staff Response about the Relationship with Stakeholders

The fuel supply chain includes different stakeholders. Oil companies should communicate with competitors and others to have a common agreement regarding safety on the road. From this perspective company staffs are requested for the relationships between stockholders and competitors.

As indicated in below table 9, item 1, the companies' staff were asked whether their company have a tool to control drivers annual leave or not. Therefore, 9.1% of the respondents strongly disagreed and 31.8% of the responds disagreed. Others 22.7% remains neutral, 18.2% agreed and strongly agreed which have equal points. However, most 31.8% believes that companies didn't control driver's annual leave which could put drivers under fatigue.

The oil companies have an agreement with transporters to provide transportation service from ports to the capital or other station in up-country depots. Therefore, if the financial situation of the transporter becomes weak from different reasons, the transporter may not be able to maintain his truck; payments of driver can be delayed or not paid at all so transporter may insist that driver should make more trips with the violation of company rules etc… Thus, the companies' staff requested to respond the financial conditions of transports are checked periodically or not. As in the below table item 2, 40.9% of the respondent replied disagree and 4.5% strongly disagree. Others 9.1, 22.7 and 22.7 respond neutral agree and strongly agree respectively. Therefore, more than 50% of respondents believe that their company didn't check the financial situations of transporters. Moreover, from the interview, company managements strengthened that the system is not implemented yet.

Table 9: Staff Response about the Relationship with Stakeholders.

No	Items	**Strongly disagree**	**Disagree**	**neutral**	**Agree**	**Strongly agree**
1	The company has a tool to control that drivers take their annual leave which reduces fatigue.	2	7	5	4	4
	%age	9.1	31.8	22.7	18.2	18.2
2	The company checks transporters financial situation which may cause fatigue to the drivers to have more trips.	1	9	2	5	5
	%age	4.5	40.9	9.1	22.7	22.7
3	Insurance companies participate in providing defensive driving training for truck drivers	3	11	1	2	22.7
	%age	13.6	50.0	4.5	9.1	22.7
4	Checking the technical conditions of fuel transport trucks by the company is adequate to protect road accident.	1	5	1	6	9
	%age	4.5	22.7	4.5	27.3	40.9
5	The company has a tool box meeting regarding road safety with competitors.	0	6	4	7	5
	%age	0	27.3	18.2	31.8	22.7
6	There is a two way of communication on road safety between the working force and the management to reduce road accidents	0	4	1	10	7
	%age		18.2	4.5	45.5	31.8

Source: own collected May, 2014

As table 9 in item 3, indicates 50% of the respondents disagreed that insurance companies didn't participate in providing defensive training for truck drivers. Similarly, 13.6% of respondents strongly disagree. Some 4.5% respondents remain neutral. Others 9.1% and 22.7% agree and strongly agree respectively. This indicates that insurance companies are doesn't participate on reducing road accidents. Besides, insurance companies complains motor vehicle insurance is the most costly with none profit business firm. As the insurance manager implies the firm is accepted only not to lose other related businesses such as life insurance and house insurances. Therefore, insurance companies should avail training to drivers to reduce accidents which means reducing their costs.

Furthermore, as the annexed table 9 item number 4 respondents opinion about the checks on technical conditions of trucks before assignment by the companies is adequate or not. Thus, it shows that 40.9% of the respondents strongly agreed, and 27.3% responds agree. Besides, 22.7% responds disagree and 4.5% responds each strongly disagree and neutral. From

respondents rating it can be seen that oil companies had well done in mitigating road accidents by checking trucks technical condition prior to assigning them for trips.

In order to have mutual agreement between fuelling companies, it is crucial to have a periodical tool box meeting. In this perspective, item 5 in the above table, shows that 31.8% of respondents agreed, that there is a toolbox talk with compotators regarding road safety. Similarly, 22.7% respond strongly agree. The remaining, 18.2% and 27.3 respond neutral and disagree respectively. Besides, the companies staff and managers consider that one of the major challenge is the companies couldn't come to mutual agreements in safety maters. Moreover, some oil companies prohibit night driving but, others don't have regulations for night driving; this could create conflicts between transporters and oil companies which don't allow night driving. In such a case, the company which runs for safety may lose its transporter that needs more trips to earn more profit. Therefore, companies should come to agreement for safety reasons. Moreover, the government should intervene to set standards to reduce road safety by imposing oil companies upon mutual agreements.

Respondents' opinion on item 6 in the table above, a two way communications oil companies have with their working force shows that 45.5% of the respondents agree with the proactive measures which are taken by the companies and 31.8% of respondents strongly agreed.18.2% disagreed with the two way communication. However the oil companies communicate with the working force to mitigate road accidents by asking as well as telling. Therefore, the work force feels proud of their performance and wants to perform better. Thus, drivers care for themselves and others by proactively mitigating the road accidents.

Apart the above questionnaires the companies' staff has given their opinion on the strength and weaknesses of their companies towards reducing road accidents. Especially, staffs from multinational companies mentioned the strength of their companies in providing defensive driving, road mentoring and using advanced technology to impose the safety rules. Similarly, the needs for improvements are: lack of standard rules and regulations among companies, government policy that lacks standards for the age of trucks and the low profit margin for transporters.

4.7. Oil Companies Challenges towards Safety Measures Implementation

Oil companies have faced a number of challenges while implementing safety measures to mitigate the road accidents. Drivers' attitude is one of the challenges and there are reasons to launch safety precautions for drivers as proactive measures. Some of the regulations are: drivers are prohibited to use alcohol, chat, and mobile phone while driving. However, unless the attitude of drivers is changed, it is rather difficult to control all this things on the road. From this perspective drivers were requested to respond on the following items:

4.7.1 Drivers Attitude

Table 10: Drivers Response on Attitude Change towards Safety Measures

No	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Alcohol test should be done always by traffic police or by the fuelling companies to protect road accidents.	10	13	9	18	44
	%age	10.6	13.8	9.6	19.1	46.8
2	Using " Shishsa" and "chat" while driving leads to road accident	8	3	7	17	59
	%age	8.5	3.2	7.4	18.1	62.8
3	You always used safety belt while driving.	4	7	6	26	51
	%age	4.2	7.4	6.4	27.7	45.7
4	You never use mobile phone while driving.	34	10	8	26	16
	%age	36.2	10.6	8.5	27.7	17
5	Annual medical check-up helps to drivers.	5	5	4	18	62
	%age	5.3	5.3	4.3	19.1	66

Source: Own Source, May, 2014

In the above table item 1, regulations in using alcohol while driving, 46.8% of the respondents strongly agree and 19.1% agreed. This shows that the majority of the driver's attitude towards alcohol is changed. Others 9.6% remain neutral, 10.6% and 13.8% respond strongly disagree and disagree respectively. Oil company managements strongly impose not to use alcohol while driving. From the interview, Total Ethiopia has purchased the instrument for checking the content of alcohol in the blood (BAC tester). Therefore, surprise checks have been done by the company on drivers and operators in bole aviation depots. However, as shown in the table above, 24.4% of drivers disagree with company's regulation. Therefore, companies should work to persue for those drivers that drunk driving could expose drivers to road accidents.

In Ethiopian context, it is a common practice for some drivers to use “chat” and “shisha” while driving on the road. Therefore, oil companies trying to insist drivers not to use such things on the road. From this perspective on the table above item number 2, implies 62.8% of respondents strongly agree with the idea and they never do it while driving. Similarly, 18.1% responds agree that using “chat” is exposing to road accidents. As the data from the table show the majority (80.9%) of drivers knows that using “chat” or “shisha’ while driving could cause road accidents. Besides, nearly 20% of the drivers don’t accept the regulation. Thus, it is difficult to control those drivers on the road since they are operating in distances from companies. Therefore, oil companies should create awareness through training to change their attitude.

On the table above item 3, drivers are asked about their usages of safety belts especially in up-countries where traffic police men are not controlling the roads. As it can be seen from the table, 45.7% of the respondents strongly agreed. They assume that driving without safety belt could cause fatalities.27.7% respond agree. However, 6.4%, 7.4%, 4.2% respond neutral, disagree and strongly disagree respectively. From the data the majority (75.4%) use safety belts while they are driving in up-country roads where traffic police men are not in place.

Even though, nearly 25% have negative attitude in using of safety belts. Besides, safety belts and airbags in the vehicles cabin protect the driver from severe injuries or fatalities while vehicle crash is occur. From the interview management strengthen that reducing fatality rate by using safety belts is crucial and vehicles shall be equipped with airbags. Therefore, drivers should imposed by companies to use safety belts in all driving conditions.

Accordingly on the table 10, item 4 asks about drivers’ usage of mobile phones while they are driving on the roads. Surprisingly only 17% strongly agree, and 27.7% responds agree. On the contrary, 36.2% strongly disagree and 10.6 % responds disagree, the rest 8.5% remains neutral. Thus, significant number of drivers uses their cell phones while they are driving on the roads. Besides, different literatures advocate that using mobile cells while driving could causes road accidents. Moreover, Mobile cells could cause fires while used nearby flammable products. Therefore, companies should create awareness to drivers to change their attitude about the usage of mobile phones.

On the 5th place from the above table respondents were asked for the use of annual medical checks.66% of respondents strongly agree that to reduce road accidents medical checks are

mandatory and 19.1% responds agree. Thus, drivers well understood the benefits of medical checks to know their health status which helps them for on time medication if any deviations are exhibited. From interview strengthen driver's position that the operation needs healthy physical and mental conditions to manipulate the vehicle and to take sudden action while incidents occurred on the road.

4.7.2 **Training Acceptance by Drivers**

Training enhances drivers skill and knowledge on how to drive defensively from possible accidents made by other parties such as vehicles driven in opposite direction or driving at the back and the available distance between two road vehicles. Therefore, drivers were requested to respond regarding trainings that are provided by oil companies.

As one can see from the table below, item1, drivers are requested to respond about the adequacy of the training on defensive driving that is provided by oil companies. From this perspective, 59.6% of respondents strongly agree with the training, 25.5% responds agree. Thus, results show that the training is very useful for drivers to reduce or totally eliminates road accidents. Similarly, from interview management dully emphasizes that 50% of road accidents from third party involvement; non trained driver, pedestrian or animals. Thus, it strengthens that company drivers are well trained.

Table 11: Drivers acceptance for training

No	Items	Strongly disagree	Disagree	neutral	Agree	Strongly agree
1	Defensive driving training which provided by the company is sufficient	3	9	2	24	56
	%age	3.2	9.6	2.1	25.5	59.6
2	Mentoring on the road is done by the company. Hence it helps drivers not to have road accidents	5	5	7	15	62
	%age	5.3	5.3	7.4	16	66
3	As an operator/driver you have sufficient product knowledge and the impact to the environment where spillage is occurred.	4	7	4	23	56
	%age	4.3	7.4	4.3	24.5	59.6.

Source: Own Source, May 2014

Moreover, drivers respond about mentoring on the road which provided by the company as one of the training package. The result shows on the above table item2, 66% of respondents

strongly agree with practical training or mentoring on the road and 16% respond agree with the training method. Others 7.4% remains neutral, 5.3% each for disagree and strongly disagree. This shows that mentoring is by far better than in the room training for drivers especially who are at lower levels of educational background.

On the other hand drivers should know the product behavior that they transported from abroad to the country. Therefore, training should avail for the necessary safety precaution since the product is highly flammable and dangerous once it is exposed to flammable materials. As we can see from the above table item 3, 59.6% of the respondents strongly agree and 24.5% responds agree which shows that they have knowledge about the product characteristics. However, 4.3% responds strongly disagree and 7.4% responds disagree. Others 4.3% remain neutral. Therefore, companies should work better to create awareness to achieve maximum security from product hazards.

4.7.3. Drivers Perception of Oil Companies Policy and Procedures

Oil companies launch rules and regulations that help to reduce road accidents. Drivers also obey those rules which are imposed by the oil companies. Some of the companies have controlling mechanism such as on board computers to control the rule compliances. However, some of the work procedures are difficult to control through technology.

Table 12: Drivers Perception about Company Policy and Working Procedures

No	Items	Strongly disagree	Disagree	neutral	Agree	Strongly agree
1	Speed limit reduces incident/accidents on roads.	11	12	8	18	45
	%age	11.7	12.8	8.5	19.1	47.9
2	Drivers respect the rule that prohibits night driving	6	7	9	22	50
	%age	6.4	7.4	9.6	23.4	53.2
3	Divers respecting 12 golden rules such as using PPE, work at height.	8	12	10	21	43
	%age	8.5	12.8	10.6	22.3	45.7

Source: Own Source, May, 2014

As it is reviled out in the table above, item 1 the majority of the respondents (45%) strongly agree with rules of speed limit which fixed by the companies. 18% of the respondents agree and they accept the rule. Besides, 12% disagree with the fixed speed limit and 11% responds strongly disagree. The rest 8% remains neutral. The Speed limit varies from one company to another company. For example Total Ethiopia allows 74km/hr while Libya oil fixes 80km/hr. Besides, locally owned oil companies don't have speed limits. In such a case, one can create problems to others since trucks are operated in a common road. Therefore, the government should fix standard speed limit for all road users.

One of the causes of road accident is night driving; during night the probability for accident is doubled than the day time operation (Owen 2013).Therefore, drivers were asked to respond on the acceptance of the rule for night driving. As we can see from table 12 item 2, 52.2% of the respondents strongly agree and 23.4% of responds agree. This shows that the majority of the drivers respect the rule. Even though, the study shows, only multinational companies impose not to drive during night whereas locally owned companies didn't fix such regulations.

On the 3rd place in the above table drivers were requested to respond about company's 12 golden rules such as working at height, using personnel protective equipments (PPE) while driving or loading off loading operations etc… From this perspective 45.7% of the respondents strongly agree with the rule and 22.3% respond agree. This shows that drivers accept company rules that protect them from road accidents. It is well known that personnel protecting equipments help drivers from injuries or fatalities while accident occurred.

4.7.4. Challenges in Cross Country Roads.

Road conditions are one of the threats for drivers and oil companies which cause road accidents. It is believed that the roads with in the country are not convenient for those long vehicles. Moreover, the topography of the country which contains up hills and downhill with curves has significant contribution for road accidents. Therefore, drivers were requested how the road challenges their day to day operations.

Table 13: Issues Related on Road Condition.

No	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	The road you use to drive is free from dip holes and out of roughness.	25	29	9	8	23
	%age	26.6	30.9	9.6	8.5	24.5
2	Vehicles under breakdown which parked for long in or near the roads are a threat for road users.	8	9	9	17	51
	%age	8.5	9.6	9.6	18.1	54.3
3	There isn't in place sufficient road signage to indicate curves, downhill, uphill's etc…	5	6	4	17	62
	%age	5.3	6.4	4.3	18.1	66

Source: Own Source, May, 2014

From the above table item 1, drivers were requested to respond about the road conditions. As we can see from the above table 26.6% of the respondents strongly disagree and 30.9% responds disagree which shows that more than 50% of the respondents have considered the road is one of the cause for accidents. Besides, 24.5% of the respondents strongly agree that the road is not a threat for road accidents or it is comfortable to have accident free operation. From this perspective, up country roads are not convenient for cross border vehicles. Besides, the road condition, transporters complaint through interview that the roads have impacts on equipment damage. Especially deep holes and road breaks causes for cracks in trucks tanker and braking of their leaf springs. Currently the prices of spare parts are much higher and in time maintenance is crucial to reduce road accidents.

Vehicles under breakdown are parked on highways for long in up-country roads could cause road accidents. Respondents were requested to respond about the problem on the above table item 2, (54.3%) strongly agreed that those vehicles are threats for road users. Similarly, 18.1% of the respondents agree with the problem. The majority (72.4%) of respondents are agreed and believed those trucks should be towed and parked out of the roads. Therefore, fuelling companies should insist the government to get a solution. From the interview, road transport officials declare that government purchases one crane to move those vehicles from the road whenever breakdown occurred in Djibouti corridors.

The respondent's opinion with respect to the road signage from the above table item 3 revealed that 66% of respondents strongly agree. This shows there isn't sufficient road signage on up country roads. Out of the total respondents 18.1% agree with the problem. Signages provide important information to road users about what follows next beyond driver's visibility. So that drivers, take the necessary actions before driving down hills, uphill's and curves. But, without signages such proactive measures couldn't be taken by the driver which could causes road accidents. Therefore, oil companies should insist government officials to fix sufficient signage in up- country roads which gives important information to drivers.

Interview with Different Stakeholders

4.8.1 Interview Conducted with Oil Company Managers

The following questions raised for discussion with oil companies transport managers

1. Why oil companies seek to reduce road accidents? What proactive measures are taken by the companies and what are the challenges and practices to mitigate road accident in the sector?

The manager mentioned the following reasons why the companies run to reduce road accidents

- *Total Ethiopia is socially commuted multinational company. Therefore, its business should be performed with responsibilities not to harm the community.*
- *The business at the global level performed with stock exchanges in daily and hourly basis, If the company is not socially responsible company, the sales on shares will be declined or the stock exchange is affected because of the fact that no one is interested to purchase shares from a company which is not socially responsible.*
- *Total has plane to run the business with the targets of zero fatality. Therefore, the operation should be free from any accident events. Hence, to achieve the pre-determined target, proactive measures have been taken every day and every hour where ever we are operating in the country.*

2. What are the proactive measures that are practiced by the company to mitigate the road accident?

- *Total has done a lot regarding road accidents. We have a target for zero fatalities which is rather difficult in Ethiopian context. Thus, to achieve our motto, we provide defensive driving training by in-house and outsourced experts. Drivers are checked from the*

selection process before placement to the operation. Moreover, on the road mentoring is practiced by the company to enhance drivers for better skill and knowledge. Apart trainings we use the technology such as on board computers to control drivers malfunction on their day to day driving activities.

3. The challenges and possible solutions are specified by the manager hear under:

- *From our investigation, 50% of accidents on the road occurred through third party contributions. Therefore, all stockholders should be committed for safety. Especially, government has to be intervening to have standard safety measures in each business firm. In the meantime, 46% of vehicles are aged above 20 years and 54% of vehicles are under the age of 10 years. In such a case old vehicles could cause road accidents and became threats for the company. The profit margin for transporters and oil companies is too low. Hence, it couldn't allow transporters to purchasing new trucks with better safety futures.*

As mentioned from the interview multinational companies work a lot to reduce road accidents with zero fatality objectives. However, third party contribution as mentioned by the manager reaches about 50% which indicates that to reduce road accidents, there should be standard procedures to have trainings and enforcements to all road users by the government.

Similarly, the manager of Libya Oil Ethiopia and NOC raise similar notions with the above arguments. They unanimously emphasized the sector needs government intervention to have common standards.

4.8.2 Interview with insurance companies

There are huge costs of accidents from minor injury to fatalities and equipment damages. According to National Bank of Ethiopia annual report (2013) insurance companies both government and private incurred net claims of 1,243,170,000 birr in the year 2012.Similarly, 1,528,333,000 birr in the year 2013 has been paid for the victims. The researcher conducted interview with two selected insurance companies (one from privet and one from the government insurance companies)

4.8.2.1 Interview with Privet Insurance Company.

Lucy insurance is one of the recently introduced private companies and has clients from fuel oil transport companies. They have experienced road accidents including fatalities and provide coverage for the damages in accordance with contract agreement that is made prior to accidents and premiums were paid accordingly. The following questions were raised to the managers and experts both interview and focused discussions.

1. Is there sufficient proactive measures towards reducing road accidents by your company? What opportunities or advantages encompass the company by reducing road accidents and what matters could change the attitude of drivers towards reducing road accidents?

> *The major activities of the company are receiving premiums from clients and serving clients whenever they face accidents in accordance with their contract agreement which made prior to the event. From this perspective, it is true that if the accidents are reduced, we can make more profit. However, the following factors aggravate road accidents in considerable manner: the long service years of vehicles, fatigue on drivers, lack of adequate training and none experienced drivers especially, currently issued license holders are the threats of the company. Therefore, we should do a lot on training to change the attitudes of drivers and to enhance better skills*

2. Is your company participate by providing defensive *training* for drivers, or is there a tool box meeting with stock holders such as vehicle owners, oil companies , government etc… and what possible solutions would you suggest to eliminate those unwanted events?

> *As a private company currently we are working with competitors. We know that fuelling companies insist not to drive during night, alcohol policies etc...We appreciate all this things. However we couldn't enforce our customers do this and don't do that. But, the only tool that we have is reducing their premium, if they are not involved in accidents throughout the year. Therefore, currently we don't have tool box meetings with stockholders. For the future, government should have standards to operate in the country which could enforce all stakeholders. Thus, it helps to reduce road accidents and reduces unfair computation between insurance companies.*

From the conversation, the insurance companies don't have a strategy to participate in proactive measures to reduce road accidents. However, they proposed some points to mitigate the problem such as operating by two drivers instead of prohibiting night driving. Hence, the vehicles could have an opportunity to operate in cool weather which could reduce the wear and tear of tires and other internal parts of the vehicle.

4.8.2.2 Government Insurance

The Ethiopian insurance corporation established in 1973 which currently has 52 distribution channels throughout the country. The insurance provides life, property and liability insurance

covers for its clients. According to their annual report (2010), the corporation has strong reliable financial standing with lion's shares of 43.2 % from the total market.

Similar questions have been raised to Ethiopian Insurance Corporation Marketing and strategy manager and he replies:

- *The motor insurance is categorized with none life or property insurance and earns premium 35% of the total earning. However, the cost which is paid for vehicles accident claim is 75% of the total expense which is not acceptable as the profit seeking company. Even though, we accept the losses not to lose the related business. In order to reduce the road accidents, we are working with traffic police men as a sponsorship; providing training for mechanics and participating in occasional events regarding reducing road accidents. However, currently we don't have permanent tool box meeting with oil companies or transporters. But, we have frequent discussions with road transport authority to revise some procedures such as issuing 5th grade driving license at once without any driving experiences.*

4.8.3. Interview with Transporters

Transporters (vehicle owners) are one of the stakeholders who are in front line with road accidents. They could lose their properties and human lives if the accident ends with fatalities. Insurance companies cover the maintenance costs of the vehicle, the spilled product and fatalities which may occur during the event. However, there are costs that are not covered by insurance companies; the government revenue tax, driver's salary and the profit from the business are some of the costs which incurred to transporters while their truck exposed to road accidents. The interview conducted for eight transporters representatives. However, because of the resemblance of the subject matter, transporters respond similar notions for the interview questions. Thus, it is compiled and interpreted here under:

The interview began with the backgrounds of transporters and their intension to reduce road accidents. From the explanations, their proactive measures begin with the recruitment and selection of drivers. They use different methods for recruitment of drivers. However, the common method is that the existing drivers should have witnessed about the newly selected driver that has to be seen while operating someone's truck on the road. This could be done after or before selection that the existing drivers introduce the candidate. Moreover, minimum

requirements such as valid driving license, minimum educational background (8th grade) and some owners request collaterals should be fulfilled by the candidate.

Transporters were also asked about the adequacy of training which is provided by the oil companies. They unanimously agreed that the training is useful to reduce road accidents. Moreover, the controlling mechanism by using on board computers is highly appreciated and they can easily download the records which allow evaluating their drivers in case of violations. However, the rest time which has been imposed by oil companies lacks flexibility and they prefer for their drivers and the equipment to have a break on mid-day of some regions such as Summera and to compensate through night by driving one or two hours.

Finally, transporters were requested about the threats on the road and what shall to be done to reduce road accidents by oil companies and the government. They responded that government should revise the procedures of currently issued licenses. They strengthened drivers' fear in which the currently issued license holders lack experiences to drive defensively i.e. not to have accidents and to be causes of accidents for others. From their explanation, the cross border travel trucks are became aged and operating with huge maintenance costs. Thus, they couldn't able to purchase new trucks with better safety features because of very long payback period and the price of tires and spare parts becomes expensive. Therefore, government should facilitate for tax free import similar to construction equipments since fuel transport system is crucial to the country. Regarding oil companies, they should insist government to have standard rules and regulations to all road users, if not it is clapping with a single hand which could not eliminate road accidents.

4.8.4. Interview with Road Transport Authority

Road transport Authority is a government body which has mandates to control all road users within the country. Therefore, interview has been conducted to have a clear picture in the problem. As explained by the division directors and assigned experts, the government working to reduce road accidents in a considerable manner. The trend was about 136 people per 10,000 vehicles. However, it is planned to reduce up to 40 peoples per 10,000 vehicles. From this perspective, they were asked to explain how to reach to this figure and what proactive measures will be taken on the existing problems such as vehicles are parking on high ways for long due to breakdown, there are not clear signage's on some areas of the road, roads are too narrow, vehicles are operated by none experienced drivers etc… From explanation:

Government has purchased one new crane for 20 million birr to tow those vehicles which are under breakdown on highways of up-country roads. Therefore, in Djibouti corridor the problem will be solved sooner or later at the end of the year 2014.Similarly, to control over speedy vehicles, radars *are purchased and distributed to regional governments. Therefore, over speeding vehicles will be controlled.*

Finally, the representative were asked to explain the government position about the license which are currently issued and safety issues that are imposed by multinational companies such as prohibiting night driving, speed regulation and using technology.

Regarding safety measures which are currently imposed by multinational companies are appreciated and the government also initiates not to have night driving for passenger transporting vehicles. However, fuel transporting vehicles are not included because of limitations on the number of trucks. The country's energy requirement is 294,565,000 litters for all types of products on monthly basis. In order to transport such a huge quantity, we have about 1,871 trucks which needs on average 3.5 trips per month. Therefore, to manage the system, day operation alone by the fleet is not sufficient. Thus, government forced to use those trucks with maximum utilization to avoid any product scarcity and unnecessary payments for demerges.

The currently issued driving license holders may have much more accidents while comparing with previous once. Therefore, government plans to upgrade the Kality training center at collage level to mitigate the problem. Similarly, government tries to impose new technology for each transport vehicle owners. Besides, the huge coast (25,000 to 30, 000birr) which is unaffordable by owners and lack of dedicated company to fix the technology is the challenges for the government.

From the interview government have challenges with limitation of fuel transport trucks and tries to get maximum utilization with the existing trucks by driving day and night which obviously cause road accidents. Therefore, the government has to plane to maximize the number of trucks by facilitating loan and eliminating import taxes to mitigate the problem. Moreover, the country should have uniform standards on the usage of road vehicles. The interview from oil company fleet managers strengthen that the country doesn't have policies for age limitation on road vehicles. Thus, old vehicles cause road accidents because of the wear and tear of their mechanical parts, like their break systems. Therefore government should launch policies for age limitation of road vehicles.

4.8.5 Company Challenges while Road Accident Occurred

The first problem faced while road accident occurred on the fuel transport truck is that the station which seeks for the product becomes dry and scarcity will occurred on fuelling station. To order the replacement truck takes a number of days. Thus, customers are forced to move to competitors to get fuel for their vehicles which may not return back on the future. The second challenge was that while collusion or turn over, the petroleum product is spilled to the environment. Thus, it is recorded and at the end of the year becomes environmental pollution issue which has an adverse effect on the company's stock exchange market. On the third place, multinational companies such as Total Ethiopia plan zero fatality in their operation. Therefore, if fatalities are exhibited, top management from head quarters thinking that the faller is from local management and they may come on decision to evacuate from the country since it highly affects their stock exchange market. Therefore, oil companies exhaustively working on drivers to reduce or not to have fatalities on the road accidents.

Besides, their effort to reduce road accidents they face challenges on the vehicles technical condition. Vehicle owners unable to purchase new vehicles with better futures and lack of uniform standards for all road users is a problem for companies. From literatures, 93% of road accidents occurred by drivers error (Getu, 2007). However, investigation from Oil Company records show that 50% of the road accident occurred with third party contribution. From this perspective, if proper trainings availed to drivers and able to use proper equipments road accidents could be reduced in significant manner.

4.8.6 Discussion on Findings through Survey and Interview

As indicated from questionnaires drivers exposed for road accidents because of none experienced drivers with high speed performance cause accidents on their truck and other road users. Government representative strengthen drivers complaint through interview. Especially, currently issued driving license holders became a threat for road users by improper usage of lanes, high driving speeds and using high beams nearby 50meters.

Table 14: Factors which leads to road accidents

NO	Item	Respondents	%	Rank
1	Poor maintenance of vehicle	9	9.6	4th
2	Long service years of the vehicle	11	11.7	3rd
3	Road condition	7	7.4	5th
4	Third party contribution; Pedestrians, animals, etc...	5	5.3	6th
5	Weather condition	3	3.2	7th
6	vehicle under breakdown and parked on the road	25	26.6	2nd
7	None experienced driver (especially drivers who hold the currently issued licenses)	34	36.2	1st

Source: Own Source, May, 2014

Drivers rank on second place, vehicles which parked on highways due to breakdown could cause road accidents. The interview with road transport strengthen that those vehicles cause accidents on road users which need evacuation or towing by cranes. Similarly, road condition indicating signages are not sufficiently found on highways. Thus, drivers indicated that they didn't get sufficient information what is next after driving a while.

Drivers respond that their most 11.7 % of vehicles used for several years and could cause road accidents because of the fact that the wear and tear of internal parts such as breaks and the pneumatic system which used without dated controlling system. In this regard oil company's managers strengthen through interview that 46% of the trucks are aged above 20 years. Vehicle owners also complain through interview that they are exposed for extra costs because of their old trucks and unable to purchase new trucks due to long payback period which strengthen drivers fear for road accidents.

From literatures fatigue on drivers is one of the major (34%) of the causes for road accidents. Drivers respond that road rest which is imposed by the oil companies is well recognized. From interview company's transport managers strengthen that they launch different working procedures such as avoiding night driving, controlling speed limits etc…However, government

couldn't accept to prohibit night driving because of lack of sufficient trucks in the country which obviously have an adverse effect to reduce road accidents.

From the interview oil companies face challenges towards attitude change on drivers such as not drinking alcohol while driving and not to use "chat" or "shisha." a few number (10.6%) of drivers disagree with the notion. However literatures strengthen that drunk driving is one of the causes for road accident.

The defensive driving training and road mentoring which provided by oil companies as indicated from drivers response is highly (47.7%) accepted by drivers. Similarly, company staffs strengthen for the good practices. From the interview vehicle owners appreciate Oil Company's effort towards reducing road accidents as mitigation measures by availing trainings for drivers. Literatures imply that most 93% of road accidents occurred cause of drivers error (Getu, 2007).However oil companies accident investigation records show that 50% of accidents occurred by third party contribution company transport managers and staffs strengthen that animals drivers who are driving in opposite lanes and pedestrians cause road accidents.

Drivers should have relevant academic background to read and understand their driving manuals and displayed messages on their vehicles dash board. Moreover, the technology in vehicles industry is one of the fastest growing firms and needs timely up-grading skills and knowledge of operators which have positive impact to mitigate road accidents. However, the survey indicates most (34%) of drivers found from grade 1- 8 which contradicts the company's training plan. Company staffs also strengthen that significant number of cross border drivers lack sufficient educational level to understand the training which provided by oil companies.

Multinational companies prohibit night driving while others doesn't have such regulations, one has speed limits 74k/hr others have 80km/hr and some are working without speed regulations. In such a case, one could be a threat for others since they use a single road to transport the products. Drivers were asked about speed limits and the technology that controls the regulation. From questionnaires 63% of drivers agree with the speed limits. However, vehicle owners from interview found indifferent that the speed limit regulation by multinational companies alone couldn't reduce road accidents unless the rule introduced to all road users. Besides, different literatures advocate that over speed kills people.

CHAPTER FIVE

Summary, Conclusion and Recommendations

5. Introduction

This chapter summarizes the study and is followed by conclusion. The summary includes the main issues from the research. The conclusion part originates from the findings of the study. Similarly, the recommendation part suggests possible solutions and the researcher tries to make realistic.

5.1 Summary

The main objective of this study is to assess the efforts towards reducing road accidents in fuel oil transport companies and the challenges of management in fuel oil supplying system. To achieve this objective the researcher has raised the following basic research questions indicated as follows:

1. What are the strength and weaknesses of oil supplying companies towards safety measures in mitigating road accidents?

2. To what extent did road accidents affect fuelling companies and other stakeholders in financial and non financial terms?

3. To what extent did the management take proactive and reactive safety measures to mitigate road accidents in fuel oil transportation system?

From the questioner and interviews, several problems are mentioned by stakeholders. The problems which are mentioned by drivers have tremendous impacts to the transportation firm by imposing road accidents. Insurance companies pay in billions for the damages. However, human lives couldn't be compared in terms of money. The following pointes are compiled to summarize the findings.

- Different literatures elaborate that one of the major causes of road accident is fatigue. To mitigate the problem oil company's use different methods; road rests after driving 4:30 hours, day offs, and avoiding night driving are some of the important measures. However, private owned vehicle drivers respond that they don't have annual leaves and they work without defined contract agreements.

- Currently issued driving license becomes a threat for others because of the fact that they lack experience to the road condition, speed limits and vehicles characteristics. Experienced drivers may operate defensively not to have road accidents. Even though, they could have accidents by those drivers who lack the skill and knowledge of driving. Evidence shows that most (50%) of accidents are caused by third party contribution.

- Considerable numbers of drivers (34%) are from 1-8th grade which is rather difficult to avail training and to be compatible with technology such as on board computers and to read and interpret messages on the dash boards of their vehicle. Now a day's road vehicles are equipped with sophisticated control systems which provide information prior to breakdowns.
- Most of up- country roads are without traffic signages and vehicles under breakdown are parked for long on the road. Thus, during night driving, such vehicles cause accidents on incoming or outgoing vehicles. Drivers noted that, those vehicles are threats for their day to day operation.

- Oil companies have different working procedures regarding road safety. Multinational companies have good practices towards reducing road accidents by providing defensive driving training and using technology to impose their working procedures. However, locally owned companies lack such practices. Besides, each organization should be socially responsible to the society and to the environment.

- Currently manufactured vehicles are equipped with high illuminations of front head lights. The rule that is imposed by the government to use high beams within 50 meters differences. However the majority of drivers prefer to revise the rule to 100 meters from the coming vehicle which could reduce road accidents.

- Insurance companies paid 1,528,333,000 birr in 2013from all subsidiaries (government and private) related to motor insurance claims. Such huge amount of money is a loss for the country. It elaborate that the firm is working with loses. However, not to lose related business they are forced to accept motor insurances.

- Government suffers because of lack of sufficient trucks to transport fuel products from ports to different parts of the country. Therefore, government couldn't be able to prohibit night driving to those trucks because of scarcity and demurrages from ports.

- Transporters use old vehicles with huge maintenance costs. The cost of tire and spare parts in the country becomes a threat for the sector. Thus, they couldn't purchase new trucks as its cost going high (5,000,000) which have an impact on its payback period.

- Multinational companies suffer with road accident fatalities that affect their stock exchange market. Therefore, they plan for zero fatalities in the operation. To achieve the goal, they provide defensive driving as a proactive measure and using technology as reactive measures.

5.2 Conclusion

The study assesses the safety measures towards reducing road accidents by fuel oil companies. The term accident has different meanings in different literatures .However, the Oxford Advanced learner's Dictionary (1997) defines accident as Unpleasant event, especially in a vehicle that happens unexpectedly and causes injury or damages a car/road traffic accident. Similarly, in related literatures; Road accident is caused by one or more vehicle crashes from different factors (Hiemer, 2005). These definitions reveal that an accident is unwanted event and its final outcome will be equipment damage, injuries or fatalities.

The World Bank report (2009) announces that motor vehicles in Ethiopia are 4 per one thousand people which are very few compared with neighboring countries. The same report reviles that Kenya has 23 vehicles per 1000 peoples. Besides, the accident rank of Ethiopia is 12^{th} in the world (WHO 2012). From this perspective the country is highly involved by road accidents with a limited number of vehicles. Therefore, government plans to reduce fatalities on road car accidents from 136 people per 10,000 vehicles to 40 people.

Road accident affects different stakeholders; the fuelling companies, transporters, drivers, insurance companies and the government. The oil companies are socially responsible to eliminate road accidents, Moreover; High rate of accident could affect the stock exchange market on multinational companies. In today's world companies or individuals doesn't wants to

purchase shares from none socially committed company. Similarly, drivers may lose their lives; transporters also lose their equipments or their business. Insurance companies incur in billions from motor accidents and the government could lose both humans and financial assets by the accident.

The contribution of fuel oil transport vehicles which operated by oil companies have considerable effects for road accidents. There are 9 oil companies in the country in which five of them multinationals and 4 locally owned companies. The study focuses on two multinational companies and one locally owned company.

Bulk fuel is supplied by EPSE at Djibouti and Sudan, which transported by contracted trucks of transporters to depots and customers of Oil Companies found in different part of the country. Transporters have contract agreement with Oil Companies to provide transportation service of the petroleum product. There are about 1,871 fuel trucks in the industry in which 54 % are aged less than 10 years and 46 % are greater than 10 years. Therefore, old vehicles are highly involved to road accidents because of the wear and tear of their internal parts.

The study tries to assess the efforts to reduce road accidents in Total Ethiopia, Libya oil Ethiopia and NOC. Since transporting fuel products is a dangerous activity which demands commitment on the safety requirement and vehicle standards. The results obtained from this study shows that companies especially multinational companies have taken proactive measures to reduce those unwanted events. Availing intensive defensive driving training for drivers, mentoring on the road, using advanced technology to impose the working procedures are some of the good practices which are done by the companies. However, from their accident investigations records 50% of the accidents are caused by 3rd party contribution which shows that oil companies should work with other road users to mitigate road accidents.

From the study, the researcher understands the work procedures vary from one company to another; such as multinational companies prohibit night driving while others doesn't have such regulations, one has speed limits 74k/hr others have 80km/hr and some are working without speed regulations. In such a case, one could be a threat for others since they use a single road to transport the products. Therefore, government intervention is crucial to have standards for all road users.

5.3 Limitation of the study

This study investigates the safety measures towards reducing road accidents in selected oil companies. The research area includes Total Ethiopia, Libya Oil and NOC with different stakeholders; Insurance companies, Road Transport Authorities and transporters. There are 9 oil companies in the country. However, because of time limitation and financial problem the researcher unable to cover all companies. Since, the study area is broad; it needs much more time for data collection and interpretation process. Besides, the time limitation the researcher has tried to collect and analyze all the necessary data from the institutions.

5.4 Recommendations

After data presentation, analysis, and providing answers to the research questions, the researcher provides the following recommendations:-

- The educational back ground of drivers which is registered 34% are found from grade 1-8th this has a negative impact for the transfer of knowledge through training. Moreover, currently manufactured trucks are equipped with advanced technology such as ECM and on board computers which transfer useful information to the operator. Cross-country drivers should have knowledge for certain international languages for better communication and to read and understand the information on the documents about the loaded product. Thus, to manage all this, cross border drivers should get a certain level of education; at least high school level. Hence, oil companies should intervene while recruiting drivers to alleviate the problem.

- Fatigue on driver is one of the major causes for road accidents. Multinational companies impose rest after driving 4:30 hours which have been appreciated by drivers. However, most of drivers don't have annual leave with payments. Thus, companies interfere to have a clear contract agreement between drivers and vehicle owners with the parcel of annual leave conditions.

- Different literatures advocate that accident risks would be doubled while driving at night (Owen, 2013).From this perspective, multinational companies prohibit night driving but others use 24 hours which could cause accidents to other road users who are not involved in night driving. Therefore, oil companies should have a tool box meeting with competitors and launch common agreements towards reducing road accidents. Besides, transporters needs some flexibilities on the time management such as instead of driving

on mid day around summera, it is better to have more rest and could be compensated during night by adding one or two hours. Hence, there should be discussions with transporters for any time schedule adjustments.

- Vehicles under breakdown on up-country roads become threats for road users. Driver's rank 1st from all road challenges. Thus, vehicles parked on highways cause road accidents and become a fear to drivers. Moreover, there aren't sufficient signage in some parts of the roads which gives information such as curves, downhill-uphill etc…Therefore, oil companies compel to government for on time towing of those vehicles and to fix sufficient signage's for upcountry roads.

- Currently issued drivers license by government is one of the threats for drivers who are operating for several years. As they mentioned the holders of currently issued licenses lacks skills how to drive long vehicles with load on the up country roads. Therefore, they could cause accidents to road users because of lack of experience how to use the road. Hence, government should revise the issuance procedures and companies request to government officials to revise the procedure.

- Insurance companies incurred a huge amount of money for motor accident claims. The data shows that insurance companies paid for their clients 1,234,170,000birr and 1,528,333,000 birr in the year 2012 and 2013 respectively. Therefore, to minimize their costs they have to invest in proactive measures by providing trainings to drivers and transporters with integrating oil companies.

- Currently operating trucks in the firm are 1,871 out of which 46% are greater than 10 years. Obviously, such an old vehicle is operating with a number of technical problems by wear and tear of its internal moving parts. Transporters unable to purchase new vehicles from different reasons; the huge costs of new trucks, high costs of tires and spare parts, low pays for their services are some of the reasons that they are not encouraged to buy for new equipments. Besides, cross border traveling vehicles should be capable in technical conditions with better features. Therefore, the government should facilitate this by exempting import taxes similar to construction equipments since those vehicles are crucial to the country. Similarly, oil companies should push the government for new vehicles with accident free operations in the operation.

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APPPENDIX

APPPENDIX 'A'

St. Mary's University School of Graduate Studies

Questionnaires to be filled by oil Company Workers and Transporters

Dear respected Respondent:

The main objective of this questionnaire is to gather data that help the researcher conduct a research on the "**The safety measures towards reducing road accidents in selected oil companies"**. Hence the researcher would like to request you to fill in this questionnaire. Your genuine response will significantly contribute to the success of the study. Please note that all your responses will only be used for academic purpose and the data will be treated at most confidential.

Thank you in advance for your kind cooperation and dedicating your time.

I. The following questions are to be filled by fuelling company staffs

Note:

- No need of writing your name.
- For likert scale type statements and multiple choice questions indicate your answers with a tick mark (√) in the appropriate block.
- For blank spaces please write the correct Information.
- Please note that if the space is not sufficient, you can attach paper or you can use at the back of the page.

1. Background Information

1. Name of the oil Company or transporter: Total ☐ Libya oil Ethiopia ☐ NOC ☐

2. Department: _____

3, Position in the organization: _____

4. Sex: Male ☐ Female ☐

5. Age: 18- 25 years ☐ 26-30 year's ☐ 31-35 years ☐ 36 and above ☐

6. Education: Grade 1-8 ☐ Grade 9-12 ☐ TVT or Diploma ☐ 1st degree ☐ 2nd degree and above ☐

7. Experience in this business: 2 years and below ☐ 3 to 5 years c ☐ 6 and above ☐

2. Questions Related to Company Contribution

1. The training which provided by your company is sufficient to protect drivers from road accident.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

2. Driver's attitude such as driving after taking alcohol could be changed through training.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

3. Drivers income (per-dime and salaries) enough to their livelihood

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

4. Drivers imposed by the company to have a rest after driving a while.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

5. Drivers use annual leave after working some months or a year.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

6. The company has a tool to control that drivers take their annual leave which reduces fatigue.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

7. The company checks transporters financial situation which may cause fatigue to the drivers to have more trips.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

8. Insurance companies participate in providing defensive driving training for truck drivers.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

9. Checking the technical conditions of fuel transport trucks by the company is adequate to protect road accident.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

10. The company has a tool box meeting regarding road safety with competitors.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

11. The technology such as on board computers and GPS controlling system helps to reduce road accidents.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

12. There is a two way of communication on road safety between the working force and the management to reduce road accidents.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

13. Please specify the safety measures taken by your company to reduce road accidents:

_____

14. Please specify the needs for improvement in your company which leads to increasing road accidents:_____

_____

15. If your company has cost while accidents occurred, please specify:

_____

APENDIX 'B'

St. Mary's University School of Graduate Studies

Questionnaires to be filled by truck drivers

Dear respected Respondent:

The main objective of this questionnaire is to gather data that help the researcher conduct a research on the "**The safety measures towards reducing road accidents in selected oil companies"**. Hence the researcher would like to request you to fill in this questionnaire. Your genuine response will significantly contribute to the success of the study. Please note that all your responses will only be used for academic purpose and the data will be treated at most confidential. Thank you in advance for your kind cooperation and dedicating your time.

Instructions

- No need of writing your name
- For Likert scale type statements and multiple choice questions indicate your answers with a tick mark (√) in the appropriate block.
- For blank spaces please write the correct Information

I. **Background Information**

1. Name of the oil Company or transporter: Total ☐ Libya oil Ethiopia ☐ NOC ☐

2. Transporter/Owner: _____

3. Sex: Male ☐ Female ☐

4. Age: 18- 25 years ☐ 26-30 year's ☐ 31-35 years ☐ 35 -40 years ☐ 41and above ☐

6. Education: Grade 8 and below☐ Grade 9-12 ☐ TVT or Diploma☐ 1st degree and above ☐

7. Experience in this business: 2 years and below ☐ 3 to 5 years ☐ Above 5 Years ☐

II. Questions Related with Drivers

1. The frequency of happening road accident on you or your friends might be because of:

A. Poor maintenance of vehicle ☐

B. Long service years of the vehicle ☐

C. Road condition ☐

D. Third party contribution; Pedestrians, animals, none experienced drivers etc... ☐

E. Weather condition ☐

F. vehicle under breakdown and parked on the road ☐

G. Others (please specify)_____

2. The technology such as on board computers and GPS controlling system helps to reduce road accidents.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

3. The vehicle that you operate has scheduled preventive maintenance program.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

4. The remuneration paid by the transporter is enough to your livelihood.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

5. Your employer allows you payable annual leave after working some months or a year.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree strongly agree ☐

i.

6. Have you ever face road accident before? 1. Yes ☐ 2. No ☐

6.1. If your answer is yes, please specify the causes and the damages; (fatality, spillage, injuries)

_____

_____

6.2 The type of the truck that occurred during the accident was: 1. Truck trailer☐ 2. Semi-Trailer ☐

7. Periodic medical check-up helps to reduce road accidents.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

8. The training which provided by the oil company is sufficient to protect yourself and others from road accident.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ strongly agree ☐

9. High beam lights could be used 50 meters far from the incoming vehicle. However, currently manufactured vehicles are equipped with powerful illuminations which cover more distance. Therefore, in your opinion at what distance range to be used high beams?

50 meter ☐ 75 meter ☐ 100meter ☐ 150 meters ☐

10. Please specify the safety measures taken by your company to reduce road accidents:

_____

_____

11. Please specify the needs for improvement in your company which lead to increasing road accidents:_____

_____

_____

APENDIX 'C'

III. The following questioners focus on the major challenges of oil companies.

The major challenges which influence road accidents in oil companies are listed below. Therefore, read thoroughly each of the influencing factors and evaluate them in relation to your job and then put tick mark (√) under the choices below.

Where, 5= strongly agree, 4= agree, 3= Not Sure 2= disagree, 1= strongly disagree.

No.	Item	Agreement Level				
		5	4	3	2	1
1	**Issues Related to Vehicle Technical condition and Technology (Proactive measures)**					
1.1	Before departure, drivers or mechanics always check and maintain the brakes and tire condition.					
.1.2	The truck owner respects and accepts your maintenance request.					
1.3	Your truck is subjected to maintenance in accordance with the manufacturer's Preventive maintenance schedule.					
1.4	The technology such as on board computers and GPS controlling system helps to reduce road accidents.					
2	**Issues related with Drivers Attitud**	5	4	3	2	1
.2.1	Alcohol test should be done always by traffic police or by the fuelling companies to protect road accidents.					
.2.2	Using " Shishsa" and "khat" while driving leads to road accident					
.2.3	You always use safety belt while driving.					
2.4	You never use mobile phone while driving.					
2.5	Annual medical check-up helps to drivers to reduce road accidents.					

3	**Issues Related to Drivers Training**	5	4	3	2	1
3.1.	Defensive driving training which is provided by the company is sufficient to protect you from accidents.					
3.2	As an operator/driver you have sufficient product knowledge and the impact to the environment where spillage is occurred.	5	4	3	2	1
3.3	Mentoring on the road is done by the company. Hence it helps drivers not to have road accidents					
4	**Issues Related to Road Condition**	5	4	3	2	1
4.1	The road you use to drive is free from dip holes and roughness.					
4..2	Vehicles under breakdown which parked for long in or near the roads could cause accidents.					
4.3	There isn't in place sufficient road signage to indicate curves, downhill, uphill's etc					
5	**Issues Related to Policies and Procedures.**	5	4	3	2	1
5.1	Speed limit reduces incident/accidents on roads.					
5.2	Divers respecting 12 golden rules such as using PPE, work at height, etc…)					
5.3	Drivers respect the rule that prohibits night driving					

Thank you for your cooperation!!!

APENDIX ‘D’

Interview Questions

1. Interview questions with company managers and transporters

1. Is there sufficient proactive measure towards reducing road accidents in your company (Trainings, achievements, coasts etc….)

2. What opportunities have the company obtained by reducing road accidents?

3. Is there any intervention while recruiting and selecting drivers by transporters?

4. The license which issued currently by the Road Transport Authority is really capable to operate those long vehicles?

5. Is there any tool box meeting with compotators and agreed on joint safety measures?

6. Is there Government involvement on safety measures such as launching policies to use technology by all road users and avoiding night driving?

7, Using on board computer and GPS on fuelling trucks have positive effect towards reducing road accidents?

8. Please specify the challenges happening in your company which lead to increasing road accidents:

9. What possible solutions would you recommend to eliminate road accidents on fuel transport vehicles?

2. Interview questions with insurance companies

1. In your opinion there is a sufficient proactive measure towards reducing road accidents?
2. What opportunities or advantages have the company by reducing road accidents?
3. The license which currently issued by the Road Transport Authority is really capable to operate those long vehicles without any experience?
4. Is your company participating to avail training for drivers with fuel oil companies?
5. Is there a tool box meeting on reducing accidents with transporters, fuel oil companies and the government organizations?
6. What possible solutions would you recommend to eliminate road accidents on fuel transport vehicles?

3. Interview questions with Federal transport Authority

1. What are the strategies to reduce road accidents?
2. Is there a policy to use a technology such as on board commuters to all road users especially in cross border travel vehicles?
3. Is there an enforcement to avail defensive driving training by oil companies?
4. Some oil companies prohibit night driving on their fleet management system; is there a policy to enforce for all road users?
5. One of the problems in up country road is that the vehicles parked on the roads for long because of break down. Is there any regulation to tow or evacuate those vehicles for safety reason?
6. What possible solutions would you recommend to eliminate road accidents on fuel transport vehicles?

DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of my advisor Tiruneh Legese (Asst.Prof.). All sources of materials used for this thesis have been duly acknowledged. Furthermore, I confirm that the thesis has not been submitted to any other higher institutions for the purpose of earning any degree.

_____ _____

Name Signature

St. Mary's University Addis Ababa Jun, 2014

ENDORCEMENT

This thesis has been submitted to St. Mary's University Collage, School of Graduate Studies for examination with my approval as a university advisor.

_____ _____

Name Signature