



**Assessment of fleet management practices in bottled water companies and its implication for operational performance: case of Aqua Addis bottled water company-Asku Plc**

**A THESIS SUBMITTED TO THE GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

**BY  
TSIGE AMBAYE**

**ADVISOR: BUSHA TEMESGEN (PhD)**

**September, 2019**

**Addis Ababa, Ethiopia**



**ADDIS ABABA UNIVERSITY  
SCHOOL OF COMMERCE  
COLLEGE OF BUSINESS AND ECONOMICS GRADUATE STUDIES  
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

**Assessment of fleet management practices in bottled water companies and its  
implication for operational performance: case of Aqua Addis bottled water  
company-Asku Plc**

**BY  
TSIGE AMBAYE HAILE**

BOARD OF EXAMINERS:

1.

_____	_____	_____
Department Head	Signature	Date

2.

_____	_____	_____
Advisor	Signature	Date

3.

_____	_____	_____
Internal Examiner	Signature	Date

4.

_____	_____	_____
External Examiner	Signature	Date

**ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE**  
**DECLARATION**

I, the undersigned, declare that this thesis entitled “Assessment of fleet management practices in bottled water companies and its implication for operational performance: case of Aqua Addis bottled water company-Asku Plc” is my original work and has not been presented for degree requirement in any other university, and all the sources used to support this particular study have been appropriately acknowledged.

**Name: Tsigie Ambaye**

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

This thesis has been submitted for examination by my approval as a university advisor.

**Name: Busha Temesgen (PhD)**

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Place and Date of Submission: Addis Ababa University School of Commerce (AAUSC), Department of Logistics Supply Chain Management on June 2019**

## **ACKNOWLEDGEMENTS**

First and for most I would like to honour Almighty God for giving me health and strength that necessary to complete this thesis. Also I would like to thank my advisor Dr. Busha Temesgen for his guidance and constructive comments from the beginning of the research proposal to the completion of the thesis paper. I wish to acknowledge all staff of Asku PLC particularly fleet management team members, drivers, maintenance staffs and director manager, who help everything run smoothly.

Finally, I would like to acknowledge the patience and support of my husband, Abera Atilaw. Without his words of encouragement, I never would have completed the MA degree.

Thank you all!

Tsige Ambaye - September 2019

# Table of Contents

Acknowledgements.....	iii
List of tables and figures .....	vii
List of Acronyms or Abbreviation.....	viii
Abstract.....	ix
CHAPTER ONE: INTRODUCTION -----	1
1.1. Background of the study-----	1
1.2. Problem statement -----	4
1.3. Research question-----	6
1.4. Research Objectives -----	7
1.5. Significance of the study-----	7
1.6. Scope of the study-----	8
1.7. Limitation of the study-----	8
1.8. Organization of the thesis -----	8
1.9. Definition of Terminologies -----	9
CHAPTER TWO: RELATED LITERATURE REVIE -----	10
2.1 THEORETICAL LITERATURE REVIEW	
2.1.1. Practices of Fleet Management -----	10
2.1.2. Fleet Maintenance and Vehicle Repair-----	11
2.1.2.1. Maintenance operations and strategies-----	11
2.1.2.2. Spare part management-----	13
2.1.3. Fuel Management-----	13
2.1.4. Fleet management monitoring systems & Vehicle Tracking-----	14
2.1.4.1. GPS vehicle tracking system-----	15
2.1.5. Driver Management and training-----	16
2.1.6. Workplace safety-----	17
2.1.7. The Concept of Competitive Advantage-----	18
2.1.8. Operational performance -----	19
2.1.8.1. Key performance indicator and fleet efficiency-----	19

2.2. EMPIRICAL LITERATURE REVIEW-----	20
2.2.1. Practices of Fleet Management in business companies-----	20
2.3. Conceptual Framework of the Study -----	25
 CHAPTER THREE—METHODS OF THE STUDY-----	 26
3.1. Description of the study area-----	26
3.2. Research approach-----	27
3.3. Research design -----	27
3.4. Population and Sampling size-----	27
3.5. Data sourcing and types-----	29
3.6. Data collection procedures-----	29
3.7. Method of data analysis -----	30
3.8. Reliability and validity test -----	31
3.9. Ethical Consideration -----	32
 CHAPTER FOUR: RESULTS, DISCUSSION AND INTERPITIVE-----	 33
4.1 Introduction. -----	33
4.2. Response Rate -----	33
4.3. Demographic Profile of the Respondents-----	34
4.4. Descriptive Analysis-----	35
4.4.1. Assessment on Vehicles Maintenance and Repair Practices-----	36
4.4.2. Assessment on Fuel Management Practices -----	37
4.4.3. Assessment on Vehicles Tracking-----	38
4.4.4. Assessment on Driver Management and Training-----	39
4.4.5. Assessment on Operational Performance-----	40
4.5. Regression Analysis-----	41
4.5.1. Econometrics Result-----	41

4.5.2 Estimation Result-----	42
4.5.3. Regression model-----	44
CHAPTER FIVE--SUMMARY, CONCLUSION AND RECOMMENDATION---	46
5.1 Summary of Findings-----	46
5.2. Conclusion of Findings-----	48
5.3. Recommendations-----	49
5.4 Suggested Future Research-----	50
References -----	51
Appendices-----	i

## List of Tables & Figures

Table 3.1: Target populations of the study-----	28
Table3.2 reliability test-----	31
Table 4.1 Overall Response Rate-----	33
Table: 4.2 Demographic Information of respondents-----	34
Table.4.3 Vehicles Maintenance and Repair Factors-----	36
Table 4.4 fuel management practices-----	37
Table .4.5 Vehicle tracking practices-----	38
Table 4.6 driver management and training practice-----	39
Table 4.7 Operational performance-----	40
Table 4.8 Model summary-----	42
Table 4.9 ANOVA-----	43
Table 4.10 Coefficients -----	44
Figure 2.1: Conceptual Framework-----	25

## **List of Acronyms or Abbreviation**

ABIG: Asku & Berhane Investment Group

CSD: Carbonated Soft Drinks

FM: Fleet management

GPS: Global positioning system

KPI: Key performance indicator

PLC: Private Limited Company

SPSS: statistical package for social sciences

## **Abstract**

*Fleet management concerns with the management of a company's vehicles which includes the purchase, maintenance, inventory, disposal and work scheduling with the main objective of to achieve efficiency and productivity for the organization. The main purpose of this study was to assess the effect of fleet management practices on operational performance of Asku Plc, the 'aqua addis' bottled Water Company. This study attempts to see the impact of maintenance and repair, vehicles fuel management, vehicles tracking system and driver management and training on the operational performance of the company. The study has incorporated both primary and secondary source of data. The primary data was collected using questionnaire. Secondary data was collected from journal articles, internet website, annual report and magazines. Out of 117 total populations and 67 samples size 54 valid responses were collected. Descriptive data analysis method through the use of Statistical packages for social science (SPSS) version 20.0 software was used to analyze the data. Inferential statistics such as ordered logit model were employed in order to answers the basic questions. The study incorporates four independent variables in which all of them were measured on a 5-point Likert-Scale. Apparently, mean was used as a measure of central tendency. The results indicate that, operational performance of Asku Plc is strong by improving the fleet management practices. The study also found that all variables except drivers' management and training have significant effect on operational performance of the business company. Fuel management and vehicle tracking system has positive impact on operational performance whereas vehicles maintenance and repair has a negative impact. Finally, the results on the conclusion entails us that the four research questions developed in this study were considerably rated all above average mean by the employees which actually indicates the organization fleet management practices are in a good manner. And also, the study recommends proper maintenance and repair, fuel management, vehicle tracking and drivers management practices in order to bring effective operational performance.*

**Keywords:** *Fleet management, Maintenance and Repair, Vehicles tracking, fuel management, Operational performance, Asku Plc.*

# **CHAPTER ONE**

## **INTRODUCTION**

This section encompasses background of the study, statement of the problem, objective of the study, research question, scope and limitation of the study, among others.

### **1.1 Background of the study**

Transport and logistics are both key components of a successful economy. Governments worldwide seek to increase their competitiveness through new or replacement of infrastructure (Waiyaki 2013). The transport and logistics sector plays a major role in the world economy and is a significant contributor at both the national and local level in any country. This sector underpins the economy, enabling the efficient movement of goods, services and people (Waiyaki 2013).

According to Jonsson (2008) and Waters (2009) the pressure to deliver faster and cheaper has made vehicle utilization an important aspect of fleet management (Gitahi & Ogollah 2014). Better vehicle utilization lowers operating cost through better planning. Transport planning requires software support with the use of transportation management systems. The aim is to determine routes that will provide the highest overall utilization of vehicle capacity, with as many customers served and the largest amount of goods delivered, at the same time as the delivery times are minimized. In order to provide a more realistic route, in fleet management, advanced planning also takes into account specific factors such as road and traffic conditions. Technological communication improvements in the business environment have allowed for better planning through the use of electronic data interchange (EDI), radio frequency identification (RFID), satellite navigation, and so on (Gitahi & Ogollah 2014).

Firms are, thus, no longer able to satisfy the various demands of their customers effectively with just product and price. They must also increase the performance of the product in terms of reaction speed, delivery policy, information services and flexibility. For this reason, firms are, in many instances, being forced to redesign their internal processes using different methods. (Waiyaki 2013, p 22). The increasing demand for full service leasing and associated fleet management has significantly fuelled the growth and profitability of fleet management companies in recent years. This growth sparked the interest of several other players such as automotive companies and banks that are (re)entering this market based on their own core products, be it vehicles or leasing business (Pfeifle *et al.* 2017)

As Bask *et al.*, (2010) stated Logistics and transportation services in developing countries have been changing and diverging into several service segments. The multiple services provided earlier by transport and trucking companies have been broken down into several specialized services to attain lower costs (cut-rate trucking) or to offer value-added services (warehousing, packaging, price ticketing and final assembly) through third-party and fourth-party arrangements and alliances (Kibatu 2016). A sustainable fleet management strategy is one that aims to reduce environmental impacts through a combination of cleaner vehicles and fuels, fuel-efficient operation and driving; and by reducing the amount of road traffic it generates (Martinez & Wassenhove, 2012). Hence, nowadays, local and international markets have been increasingly open and competitive, many companies and fleet managers need to focus on how they can improve the performance of their organizations in the new business paradigm.

Bottled drinking water are widely used in many urban areas in the world. This usage, according to (WHO, 2011), specifically in sub-Saharan Africa, has taken a tremendous hike in recent years because most urban folks generally regard them as safe water for drinking (Sunkari and Danladi 2016).

Asku & Berhane Investment Group (ABIG) was founded in 2013 in Addis Ababa - Ethiopia. ABIG is an umbrella management company that has formed a unique team of experts managing a diverse investment portfolio across different industries. The company started its operations with the management of a group of diversified partners and sister companies engaged in Food and Beverage, Petrochemical, Manufacturing, Import & Export, Engineering and Construction & Property Management, Health Care and other service sectors.

ASKU PLC, the Food and Beverages Group, established in 1999 by Ethiopian shareholders, is a company engaged in the manufacturing sector with the aim of becoming the largest food and Beverage Company in the country. Currently, the company is producing Bottled Water under the brand name - Aqua Addis; Carbonated Soft Drinks (CSD) in five different flavours namely RC Edge, RC Cola, RC Orange, Royal Tonic and RC Lemonade and Juices under the brand name Ethiopicana. Both the company's carbonated soft drinks and juices are produced using USA concentrate imported through their franchise agreement with Cott Beverage Inc, which is a company based in Columbus, Georgia – USA, which operates in Soft Drink, Juice, Water and other beverage bottling facilities in the United States, Canada, the United Kingdom and Mexico and sells beverage concentrates in over 50 countries around the world.

There are companies operating under Food and Beverages Group like Berossa Agro Industry PLC (milk cows) and Yid Edible Oil Industry PLC. Other than the Food and Beverages Group, ABIG company as mentioned above it has incorporates in many sectors, for instance, the IMPORT & EXPORT sector of the Kechenamba Trading P.L.C, which focuses on exporting agricultural products including coffee, oilseeds, pulses and spices; and the health care sector of Girum Hospital PLC. This study concern one of the Food and Beverages Group (ASKU PLC) of the bottled water, Aqua Addis, department of fleet management.

## **1.2. Statement of the Problem**

Fleet management concerns with the management of a company's vehicles which includes the purchase, maintenance, inventory, disposal and work scheduling. As a result of the new business paradigm, in which markets have been increasingly open and competitive, many companies and fleet managers need to focus on how they can improve the performance of their organizations. The main objective is to achieve efficiency and productivity for the organization (Borirug *etal*, 2009). In logistics and delivery management, a key element in gaining the goal of better performance is the elaboration of efficient distribution systems where goods are delivered at the right place, with the right quantity, at the right time, and to the right receiver (*ibid*).

According to Gitahi & Ogollah, (2014) there is little literature on the current Fleet Management on their concern of study in humanitarian operations as well as business operations. Wassenhove (2010) also put that data on vehicles is gathered and stored using unstructured databases like excel spreadsheets and text files (Kibatu 2014). Gitahi & Ogollah (2014) stated that well managed and maintained equipment can result in 20-30% or more cost savings. Literature reviews suggest that fuel savings of 10% or more can be obtained through a range of relatively low cost measures such as driver training, vehicle maintenance and vehicle design (Baas 2012).

On the other hand, the dynamic fleet management systems provide fleet managers and users the tools to accomplish their tasks efficiently and effectively by using technology such as Internet and Global Positioning Systems (GPS). Logistics management including fleet management requires advanced technologies to improve the logistics information system (Borirug *etal*, 2009).

Fekadu (2013) identifies the constraints associated with logistics system in Ethiopia characterized by inadequate fleets of vehicles (means of transport) for goods transport, the market possibility of the country is hampered by poor

logistics system, very high traffic accident in which contribution of goods transport is significant congestion in cities and at inlets/outlets. Furthermore, damage of goods and quality deterioration while in storage, packaging transporting, and post-harvest loss in food items (up to 70%) & lack of organization and management tools that are required to promote intermodal system (Fekadu, 2013).

The increasing demand for bottled water and the high level of competitiveness since there is an opportunity for entrepreneurs to enter the market easily nowadays makes the fleet management one of the non-price factors at the bottled water market competition in Ethiopia. Under this study, trucks and vehicles are used to transport these manufactured products to the warehouses located in and out of Addis Ababa and then to the retail customers and exclusive customer agents.

The shortage of transportation or the unbalancing of product supply with the customer demands, presented by the sales and marketing department of the company, Asku plc, is clearly manifested in all branch warehouses, customer shops and exclusive agents. Currently, the numbers of final consumer as well as customers are increased in Addis Ababa and different regions of the country as result of which the volume of distribution of the company's product increases from time to time. This makes the company not to distribute the required amount of products to the right place in time due to its fleet operational efficiency which has an impact on its market competitiveness as well as its profitability.

Finally maintenance problems of vehicles and drivers management of the company are the major observed problems in the logistics and fleet management department of the company as the researcher informally interviewed the member of the department. In this study the existing practices of fleet management of the Aqua Addis bottling company (Asku PLC) was critically analyzed and tried to show the gap between their practices with an

improved fleet management practices which will be proposed to enhance the efficiency of the fleet management system. The researcher also believes that conducting a research on this area have paramount role on fleet management factors and hence operational efficiency performance which directly related with profitability and competitiveness of the company in particular and the bottling industry in general.

### **1.3 Research Questions**

The study addressed the following research questions:

1. To what extent the fleet management operational aspects of vehicles maintenance practice performed in Asku Plc affected the operational performance of the company?
2. How do fuel management practices are performed and affects the operational performance of the bottling company?
3. How does the vehicle tracking system and driver management practices of fleet management affects the operational performance of the company?
4. Which of the factors can play a significant role in the operational performance of Aqua Addis bottling company?

### **1.4 Objective of the Study**

The general and specific objectives of this study are discussed below.

#### **1.4.1 General objective:**

The main objective of the study is to assess the fleet management practices and its implication on operational performance specifically on fleet efficiency in Aqua Addis bottling company, Asku Plc.

### **1.4.2 Specific Objectives:**

Specific Objectives of the study was based on the following research objectives:

1. To determine how vehicles maintenance influences operational performance in bottled water companies in the case of ASKU PLC.
2. To assess the influence of fuel management on operational performance in the case of ASKU PLC.
3. To assess how vehicles tracking and driver management influences operational performance particularly fleet efficiency in the case of ASKU PLC.
4. To identify factors affecting on operational performance in the case of ASKU PLC.

### **1.5 Significance of the Study**

As a research, the primary merits of the study goes to the university academics. It gives a comprehensive starting point for further research on fleet management since there are few studies in the area. Secondly, organizations get ideas on fleet management and fleet maintenance for their respective company. Organizations public as well as private companies, such as, water and beverage bottling companies gets important concepts on the overall fleet management and fleet maintenance and able to measure their efficiency and market competitiveness based on real fleet management practices and may take the recommendations to improve their fleet management system.

### **1.6 Scope of the Research**

The study mainly focuses on assessment of the practices of fleet management particularly on vehicles maintenance, fuel management vehicles tracking, and driver management and training in the case of Aqua Addis bottling water company (ASKU PLC) in its three warehouses branches located in Addis Ababa. The research also focuses particularly on the heavy vehicles and light freight vehicles (such as courier vans) which are directly used for bottled water supply

distribution to the three warehouse branches (Dire-dawa, Hawassa and Bahir Dar); and to retailers and exclusive agents, respectively. Managers, maintenance workers and drivers of the company are taken for the study. However, others department staff of the company and the distribution of out of Addis Ababa are not taken and assessing for the study.

## **1.7 Limitation of the Study**

During the study of the research there have been major and minor problems to be faced by the researcher, some of them were solved easily without affecting the study but others were beyond the scope of the researcher. Getting qualitative data from the company was another challenging thing for the researcher.

## **1.8 Organization of the Study**

The report is organized under five chapters. The first chapter represents background of the study, statement of the problem with basic research question, objective of the study, significance of the study, delimitation and limitation of the study and definition of terms.

The second chapter deals with review of related literature. It includes both theory as well as empirical evidences related to the study topic.

The third chapter presents about methods of the study. It describe the type and design of the research to be per sued, detail description of participants/sample/ of the study, data sources, data collection tools and procedures, methods of data analysis and the like.

The fourth chapter presented results and discussions about the research topic based on the result of third chapter. Here, the results/findings of the study are summarized and interpretation as well as discussion with the use of related literature review explained. Finally, the fifth chapter, the summary of the

findings will give and the conclusion and recommendations on the way to improve the performance are to give. And, finally the researcher gave her view on future research direction.

## **1.9 Definition of Terms**

**Transportation:** is represents the physical movement of materials between points in a supply chain (business dictionary).

**A sustainable fleet management:** strategy that aims to reduce environmental impacts through a combination of cleaner vehicles and fuels, fuel-efficient operation and driving.

**Fleet management:** is the management of a company's vehicle fleet, and can include a range of functions, such as: vehicle financing, vehicle maintenance, vehicle telematics (tracking and diagnosis), driver management, fuel management Health & safety management (Borirug *etal*, 2009).

**Operational performance:** is defined as Firm's performance measured against standard or prescribed indicators of effectiveness, efficiency, (business dictionary).

## **CHAPTER TWO**

### **RELATED LITRATURE REVEIW**

This chapter contains a review of existing literature on the key areas that the study covers. Specifically, the chapter describes the main practices of fleet management fleet maintenance and vehicle repair; fuel management; fleet management monitoring systems and vehicle tracking; and driver management and training. The chapter also evaluates about workplace safety and the concept of competitive advantage. The chapter also examines empirical literature and presents the conceptual framework of the study.

#### **2.1 THEORETICAL LITERATURE REVIEW**

##### **2.1.1. Practices of Fleet Management**

Fleet Management is not simply about operating the equipment and keeping it working. Fleet Management (FM), one of the logistics management activities, is very wide in scope and includes the full circle of justification, specification, acquisition, assignment, scheduling, utilization, and disposal.

Fleet Management system is about the management and operation of vehicles and their related issues in an organization and Queree C. (1993) stated that organizations may face internal and external factors which affect their operations and so as the fleet management in a company may face dynamic problems such as unplanned situations taking place during operations. As such, the study suggests that the organizations need to be able to respond in the midst of market competition (Borirug *et al*, 2009). Fleet management comprises all actions needed to maintain and operate pieces of equipment throughout its life from the beginning stages of equipment acquisition to the final stages of asset disposal. Such areas include maintenance and repair, inventory control, training, and safety issues (Hamzi *et al*, 2013).

## **2.1.2. Fleet Maintenance and Vehicle Repair**

Fleet Maintenance Management Program is a comprehensive solution to fleet management needs which involve authorization and recording of the history of the vehicles. According to K.Schneider and C.R.Cassady (2004) the fleet maintenance system provides information on every vehicle in the organization covers all the vehicles expenses and repair covering cars, trucks, and vans. From this aspect, fleet managers will be able to budget all fleet maintenance costs. An automated maintenance operation fleet management tracks the vehicles and their parts plus planned maintenance of the vehicles. This makes the tasks of repairing and maintaining fleets easier (Borirug et al, 2009).

Every business whether it is manufacturing, mining, and/or service-oriented business need equipment to deliver its outputs so as equipment is an 'asset that is critical in the fiercely competitive global economy' (Murphy, D. 2002). Within age and usage equipment degrades and becomes non operational, hence needs controlled through good operating practices and proper preventive maintenance actions (ibid).

### **2.1.2.1. Maintenance operations and strategies**

Different from regular production operations, maintenance operations are not instigated by demand from an outside customer, but by the need for maintenance of equipment. Practically several resources are needed to perform maintenance, as Arts (2013) put the most important of which are the following three (a) a specialist, mechanic, engineer or other trained professional, (b) tools and equipment, and (c) spare parts.

Maintenance operations consist largely in replacing parts of equipment while, maintenance strategies determine when parts or equipment need to be replaced or maintained. Arts (2013) classify maintenance strategies as modificative maintenance strategy, breakdown corrective maintenance strategy and preventive maintenance strategy. Modificative maintenance, is usually project based and non-recurring, concerns interchanging a part with a technically more advanced part in order to make the equipment perform better. Under a breakdown corrective maintenance strategy, a part is not replaced until it has failed, while under a preventive maintenance strategy, the aim is to replace parts before failure occurs.

Breakdown corrective maintenance is an attractive option for parts that do not wear, such as electronics. For parts that do wear, it can be beneficial to follow a preventive maintenance strategy (Arts, 2013). The study noted that preventive and breakdown corrective maintenance are the maintenance strategies that occur most often.

According to Arts (2013), Preventive maintenance strategies can be further divided into usage and condition based maintenance, stating that:

‘Under usage based maintenance, the total usage of a part is measured and maintenance is conducted when a certain threshold level has been reached. The usage of parts can be measured in many ways depending on the nature of the equipment. In condition based maintenance, the actual condition of a part is gauged and maintenance is conducted based on this. The condition of a part can be measured either periodically during inspections (Periodic inspections) or continuously through a sensor (Condition monitoring). How the condition of equipment is measured depends on the nature of equipment.’ (Arts 2013).

### **2.1.2.2. Spare part management**

Arts (2013) distinguish three different types of maintenance spare parts as rotables, repairables and consumables. He clarify that rotables as items that constitute a sufficiently large subsystem of the original equipment to warrant a separate usage based maintenance strategy by giving examples include aircraft engines and elaborate weapon or radar systems on frigates. Items that are repaired after replacement after which they are ready-for-use (RFU) again are repairables. Accordingly, contrary to rotables, repairables do not have their own usage based maintenance strategy, and are not usually individually tracked and traced. A repair shop handles the repair of many different types of repairables and; compressors and pumps are examples of repairables. The consumables are items that are discarded after replacement and bought new from a supplier. Generally these are relatively cheap items such as gaskets. Hence, these different part types generally are also connected to different maintenance strategies (Arts, 2013).

### **2.1.3. Fuel Management**

Fleet management (FM) in every organization has to deal with allowing fleet managers managing fleets more efficiently and economically with the use of purchase controls, data collection and reporting tools since the cost of fuel is changing rapidly nowadays (Borirug et al, 2009). According to their study (survey) result they found Fleet fuel management one of the nine listed tools of existing real time FM and noted that fuel management in dynamic fleet management system has been an important tool in the vehicle operation. The study suggests that the use of customized cards which are used to all fuel related activities which help to protect against irregular or unauthorized activities. Accordingly, it also allows the collection of all relevant information such as date, time, location, odometer reading, driver name, product type, unit and cost per unit, and total cost (ibid).

Research reports on Benefits of fuel efficiency suggest that it is generally accepted that saving fuel is a win-win opportunity for a number of reasons. Baas (2012) provides a number of reasons as to why commonly the benefits of fuel efficiency, stating that, it is:

‘...good for business; most fleets have the potential to save at least 10% of their fuel bill... [and] good for an economy and environment; saving fuel reduces the amount of emissions in the air that cause asthma and other health problems, and reduces the CO<sub>2</sub> emissions that contribute to climate change... [and] good for road safety; both fuel efficiency and safety are dependent on how a vehicle is driven, how well it is maintained and other factors.’(Baas 2012)

After reporting a wide range of factors affect fuel, Baas and Latto (2005) and Baas et al (2005) they specify possible measures for improving fuel efficiency. Driver training; speed management; improving fleet management practices; improving in-cab temperature control; matching vehicles to the transport task; improving maintenance management; and improving tyre management are included as possible measures listed by the research (Baas 2012).

#### **2.1.4. Fleet management monitoring systems & Vehicle Tracking**

Crainic and Laporte (1998) as cited by Yi-Chung Hu *et al* (2015) pointed out that first-generation fleet management systems provided relatively simple functionalities such as vehicle tracking components. With increased management sophistication, these systems have evolved into planning tools (Yi-Chung Hu *et al*, 2015). The concept monitoring systems is functionally different to fleet management. Fleet management involves supervising the use and maintenance of vehicles and associated administrative functions, including coordination and dissemination of tasks and related information to solve the heterogeneous scheduling and vehicle routing problem (Sorensen and Bochtis, 2010). For vehicle fleet management and monitoring, one of the main applications is the global positioning system (GPS) technology tools (Yi-Chung Hu *et al* 2015). The current logistics systems require real-time monitoring and

interaction with fleet vehicles with such technologies in order to achieve high utilization and rapid responses to customer needs.

Managing a fleet of vehicles is more challenging since it needs balancing of rising fuel costs, mounting maintenance costs and safety concerns which are critical all the while driving a commitment to excellent customer service(ibid).

The whole purpose of a vehicle is to move people and/or their goods from one place to another. Other than the major commonly considered criterion of on time delivery, as Kuehling (2018) stated, other plenty of things such as current location, destination, schedules, traffic, preferred routes, diversions along the way, parking once you've arrived and fuel levels have to check and balance for vehicle tracking system in logistics (Kuehling 2018).

Although the majority of the dynamic fleet management models assume that the travel times are deterministic, according to Huseyin (2006) as cited by Kibatu (2016), there are a variety of applications where traffic jams, equipment failures and undesirable weather conditions create substantial variability in the travel times. Even if these events are rare, the travel times may appear to be random to the modellers, since they depend on factors outside the scope of the model (Kibatu, 2016).

#### **2.1.4.1. GPS vehicle tracking system**

G.Mark and P.Parooj (1998) as cited by Borirug *et al* (2009) advocates that logistic management including fleet management requires advanced technologies to improve the logistic information system (Borirug *et al*, 2009). Information and Communication Technology (ICT) has become an important backbone for the business that aims at reducing operational costs, and increasing customer satisfaction which in turn will gain higher levels of competitiveness. The study stated that there are various aspects on how to improve the capability of the fleet and delivery systems. The key points are to provide real-time and dynamic tracking of vehicle movements, maintenance

schedules, fuel and financial management, where dynamic FM systems provide fleet managers and users the tools to accomplish their tasks efficiently and effectively by using technology such as Internet and Global Positioning Systems (GPS) (ibid).

Originally, the GPS was created to identify the precise location of any object on the earth, anytime, anywhere. Today, one of the fastest growing markets for GPS technology is vehicle tracking and location. According to Yi-Chung Hu *et al* (2015) GPS-based fleet management system technology states that it has ‘provided synergy to transport companies and has achieved many management goals such as monitoring and tracking commodity distribution, energy savings, safety, and quality.’ (Yi-Chung Hu *et al* 2015).

### **2.1.5. Driver Management and training**

Baas (2012) argues that driver behaviour and education are directly imposed with improvements in fuel efficiency and safe driving practices. Hence, accordingly driver training is aimed at improving fuel-efficient driving and decreasing incident rates. Following their finding a number of initiatives were introduced, aimed at improving driver behaviour and education.

Baas (2012) the author stated that there is a general and often misleading assumption made by drivers of speeding and driving more aggressively will result in a substantial reduction in their travel time. (DfT2004), UK SAFED programme, an independent review noted that:

‘One of the main barriers to SAFED training was the perception that driving fuel efficiently meant that journey times would be lengthened. There is now evidence from the training to show that this is not the case. Driving times are broadly comparable over the same distance using SAFED techniques and not using them. This combined with the cost savings identified have helped in getting training widely accepted within the industry.’(Baas 2012).

There can be as much as 35% difference in fuel consumption between a good driver and a poor one. Accordingly the difference is largely created by differences in road speed, gear selection, the engine speeds at which gears are changed, aggressiveness of accelerator and brake pedal use, and the amount of time the driver leaves the vehicle idling (Baas 2012).

Baas (2012) identified many steps taken to improve driver management in which level of recognition was directly related to individuals' safety behaviour, customer service and incident rates. The drivers' recognition scheme encouraged honest reporting. The steps included developing a comprehensive prestart check sheet, ensuring that drivers understand that they are responsible and accountable for their actions, improving driver recruitment procedures, educating and coaching drivers about vehicle standards and visual inspections, holding regular monthly driver forums, developing a culture where a driver can intervene in any unsafe or non-compliant act, preparing monthly feedback reports on individual driver performance and vehicles related to speed and fuel consumption, developing a culture of continuous improvement within the driver teams to focus on total fuel consumption and driving techniques, including urban operation and all drivers participating in an individual driver recognition/incentive scheme that rewards positive behaviours and outcomes (Baas 2012).

### **2.1.6. Workplace safety**

Hence, employee safety on the road can at first seem relatively complex for companies, the workplace is a largely closed environment with controlled access and the road network is by contrast a largely open environment with open access (Small and *et al*, 2016). Just as in other aspects of workplace safety, focusing on vehicle safety and driver Safety is a key part of the contribution. This achieves as stated by Christie (2011), through taking new vehicle safety technology and protective measures need to be provided for employees who are exposed to road traffic risk. The common fleet management

provisions are post -licence driver training programs. However, due to the overall limited effectiveness of driver training to produce crash reductions, research throws much doubt on their effectiveness as fleet crash reduction measures (ibid).

### **2.1.7. The Concept of Competitive Advantage**

Business firms are facing a challenge from market in which they compete that requires a wise move to stay. The traditional ways of doing business and running a company cannot apply in an environment there is a stiff competition. A business firm must make unreserved effort to provide its customers with more advantages than its competitors must in order to be successful. These advantages could be achieved through the main winning strategy called differentiation. In differentiation strategy, because of which the customers find the firms product unique and more attractive in some way and therefore the customer, is willing to pay premium price. Some of the attributes firm uses to differentiate their products are; after sale service convenience and quality, services could be a critical factor in deciding among alternatives; and cost leadership: requires achieving a low cost position relative to once competitor (Chalachew, 2010).

Delivering a seamless service, hence, has become a source of competitive advantage for the logistics industry. Fleet management systems have been available in the logistics industry for many years (Yi-Chung Hu *et al* 2015).

## **2.1.8. Operational performances**

operational performance is an organization's performance measured against standard or prescribed indicator of effectiveness, efficiency and environmental responsibility such as cycle time, productivity, waste reduction and regulatory compliance in which their measurements is key for continual improvement process (Welansa 2018). Performance metrics are needed in order to measure of outputs or results which can describe using words or numbers. According to John Sullivan (2004) metrics generally cover five assessment areas including quantity, quality, time, money and satisfaction (ibid). A broader conceptualization and more effective business performance should include indicators of operational performance. This study, focus on operational performance of the fleet efficiency to measure the benefits of fleet management practices.

### **2.1.8.1. Key performance indicators and Fleet Efficiency**

Key performance indicators are used to monitor the efficiency of fleet operations. Key performance indicator (KPI) can help to better predict when a vehicle needs maintenance and can prevent unplanned down time or failures in the field (Oracle 2017). Hence a metric or a key performance indicator in any measurable value demonstrates how efficiently fleet is operating and helps to meet business objectives. The collection of data for an extended period creates a historical record of operational data which is used to predict by analyzing it. The data also help one to know where to make changes to reduce risk, improve the efficiency of fleet, and enhance customer service (ibid).

Accordingly, KPI are typically grouped in three categories of safety, efficiency, and compliance. Safety KPI category constitutes speed violations, driving speed, alerts etc monitors driver behaviour and provide data that can use to promote and improve driver safety. The efficiency category in other case monitors operational performance and provide data that can use to reduce wear and tear on vehicles and maintenance costs. The category has sample KPI

types like consumed fuel cost, idling violations, idling durations, and fuel consumed (Oracle 2017).

Fuel consumption in heavy trucks operations, like construction operations is one of the critical components in the operating cost. Fuel consumption is greatly influenced by road topography. Several researchers have examined fuel consumption reduction methods that use information concerning road terrain (Jiali Fu 2017). Jiali Fu mentioned many studies and all provide the theoretical background of improving fuel efficiency by regulating speed/acceleration on different topographical road profile. Accordingly, the advancement of new information and sensing technologies has facilitated the further development of methods to improve fuel efficiency. In recent years, several studies have been conducted to improve fuel efficiency by combining road topography and signals from Global Positioning System (GPS) (Jiali Fu 2017).

Generally as Scott (1998) states that the minimization of fuel consumption and the maximization of vehicle utilization are the tools that can be used to improve operational efficiency (Meseker 2018). Strategic manager, fleet manager and operations manager have their tasks responsible for in which fuel consumption management to be efficient. A fleet manager is a responsible body for the task of fuel management program which save money even in other areas to improve operations. Communications and telemetric technology can improve vehicle utilization which reduce the need for new vehicles and lower operating costs (ibid).

## **2.2. EMPIRICAL LITERATURE REVIEW**

### **2.2.1. Practices of Fleet Management in business companies**

Fleet management in Europe is a multibillion-euro industry based on a profitable business model. Pfeifle *et al* (2017) on their study of Fleet

management in Europe, they found and put four key success factors for fleet management by arguing that Fleet management is a highly profitable business. Accordingly the factors are strong funding and service mind-set as competitive advantages; able to shift from vehicle-related services to driver related-service; size matters – regarding footprint and fleet size, based on customers demand; and multi-brand is the key to fulfilling customer requirements (Pfeifle *et al*, 2017).

Maintenance spare parts planning and control also has a significant financial impact. To illustrate this here are some impressive statistics: a study by Aberdeen Group (2003). In 2003, spare parts sales and services (mostly maintenance) accounted for 8% of the gross domestic product in the United States and; a study by Deloitte (2006) among 120 large manufacturing companies in North America, Asia Pacific and Europe shows that service revenues represent more than 25% of total business (Arts, 2013).

(Baas, 2012) his work entitled fleet management commitment to fuel efficiency with the aim of identify ways of overcoming the barriers faced by managers of New Zealand's light and heavy vehicle fleets took place case studies of seven giant companies incorporates in fleet management practices identified that the nature of transport fleets in New Zealand and those in other countries are significantly different because of the nature of the transport task, the road environment, fleet composition, fleet ownership structures, fleet management culture, regulations, compliance and enforcement. These differences mean that New Zealand solutions need to be found other than the way of the United Kingdom (UK), the United States of America (USA) and Canada, have implemented very successful schemes in improving the fuel efficiency.

A feedback made a number prevailing experience comes after series of consultation meetings were held with transport operators, equipment suppliers, transport industry associations and the relevant government agencies. Amongst the main points are: very few operators monitored fuel

consumption; many operators found that fuel cards are unreliable as a means of monitoring fuel consumption because multiple vehicles can be filled with the same card, different drivers may use the same vehicle, and auxiliary equipment is also fuelled; driver training did not adequately cover fuel-efficient driving practices, as being more effective the industry wanted government agencies to coordinate the information they produce with common branding etc. The very effective in reducing fuel consumption measures aimed at improving vehicle use, the necessary of monitoring and facilitating the introduction of new technology and supporting strongly the use of case studies are other feedbacks of the sessions (Baas, 2012).

Baas (2012) come with finding the case studies results related to barriers to adopting fuel saving measures that are fleet managers often do not have any formal training in financial management and therefore do not have a good handle on what each truck costs to run over its lifetime rather, fleet managers and owners largely base their decisions on the experience of previous generations of fleet managers. As a result, very few fleets are putting effort into saving fuel despite the financial benefits. Accordingly, he find that managers are too busy dealing with day-to-day issues to introduce new initiatives that require a proactive approach; very few operators measure fuel used by individual vehicles; often concerning with issue of the attitude of drivers and other staff; lack of accurate and independent information on options; slipping back into old habits and non staying in company after training of drivers; fleets generally use GPS tracking systems to solve particular issues and review specific events rather than looking for trends (Baas, 2012).

A study used the P Transport Company, which operates the largest shipping line in Taiwan, is a subsidiary of a famous food and retail conglomerate, which is the largest group of chain stores in Taiwan, as an empirical study Case by Yi-Chung Hu *et al* (2015) as a baseline of the attempting and unsatisfactory

and not successful results of begin introducing electronic operations and systems to enhance its competitiveness in the industry and to achieve the goals given by the corporation, in the hope that these systems would lead to higher corporate operating efficiency. The study results with the finding of the very important to the logistics industry of GPS-based fleet management systems especially in transport companies in order to monitor and track commodity distribution, thus saving energy. Moreover, accordingly, the systems also improve scheduling, operating efficiency, and effectiveness. Because fleet management systems are very important, the successful introduction of these systems has become a key issue (Yi-Chung Hu *et al* 2015).

Having the purpose of identifying the key factors for introducing GPS-based fleet management systems to transport companies of their research they combined DEMATEL and ANP to determine the key indicators, and identify the most important one, and discover how it affects others. They overcome with top executive support was determined to be the most important criterion in their study; other key factors selected were funding and budget, experience and ability of consultants, project team composition, user recognition, timely and correct information, and degree of completeness of transmission equipment. They discussed these seven key factors in their research conclusions (Yi-Chung Hu *et al*, 2015).

Hamzi *et al* (2013) work entitled Fleet management: assessment of the best practices stated that a company fleet management process is evaluated using and combining of two methods: HADDON Matrix and Network Influence in order to assess the best practices in its fleet management. They present the results of the application of the HADDON matrix method which is a very useful self-audit tool. It is used simply by asking the question 'do we have the following in place?' for each of the selected factors/ statements in their matrix. The realized factors are 'management culture, journey, road/ site environment, people-drivers and managers, vehicle and External/societal/ community/brand. The Network Influence is applied to the fleet management

using the results of HADDON matrix to identifying effective measures to improve performance. The study with the application of the HADDON matrix and remedy measures to selected oil company come with results. Hamzi *et al* (2013) provides given the objective of the use of the matrixes, stating that it is:

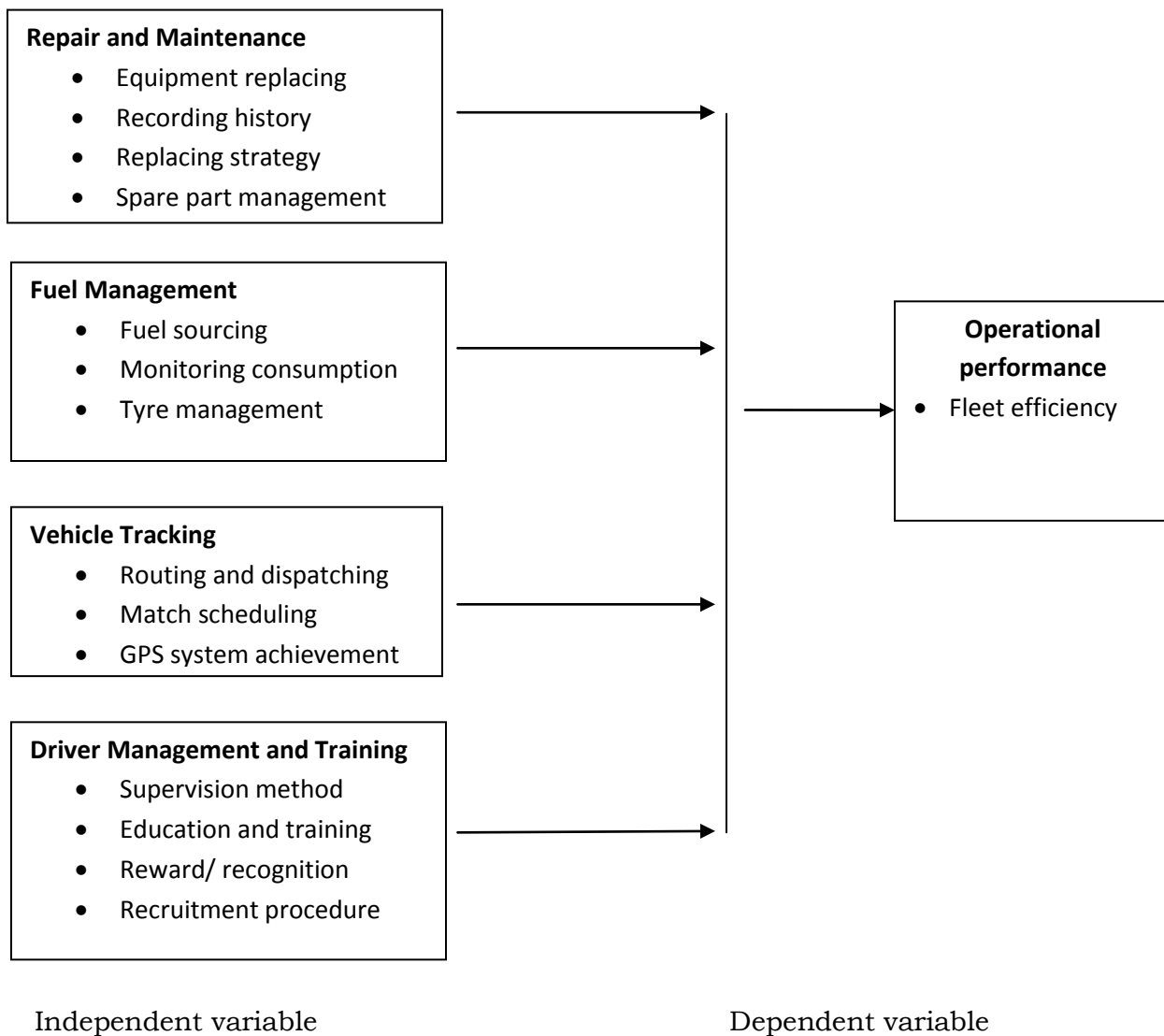
‘the objective of the use of the matrix HADDON is to minimize the damages owed to the road risk in the company; for an important distance on several shutters, it is difficult of determined which are the main shutters which contribute to the insecurity long-distance truck driver in the company and the reduction of distance of which allows of minimize the damage. The use of the influence network method permitted to remedy this problem; she revealing the elements which contribute to the insecurity long-distance truck driver which determined the most effective ways for the control of road risk in company.’ (Hamzi *et al* 2013).

Literatures show that several logistics projects are taking place, with firms implementing advanced technologies such as global positioning system (GPS) and other wireless technologies in many advanced countries. The use of wireless technology is growing rapidly in the developing countries, especially in the East African community, Kenya, for instance, has been undertaken in many such projects. There is little information available on the use of the fleet management systems, concerning the technical aspects of GPS, in Kenya o look and evaluate the way in which the implementation of GPS fleet management system has changed internal processes in Kenyan firms.

## 2.3. Conceptual Framework of the Study

According to Gitahi & Ogollah (2014), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. In the study, the conceptual Framework is look at assessment of fleet management practices of Aqua Addis bottling company, ASKU PLC.

Figure 2.1: Conceptual Framework



Source: adapted from Gitahi and Ogollah (2014)

## **CHAPTER THREE**

### **METHODS OF THE STUDY**

The purpose of the study is to assess the practices of fleet management on product delivery to final customers efficiently (competitively) in the case of Aqua Addis bottled water. Hence, the research design and methodology part of the study encompasses research approach, research design, sample size the research based, data source and type of those data's used, method of data collection and mechanisms of analysis of the data.

#### **3.1. DESCRIPTION OF THE STUDY AREA**

ASKU PLC is one of the foods and beverages group, of ABIG, engaged in the manufacturing sector of producing Bottled Water under the brand name - Aqua Addis; Carbonated Soft Drinks (CSD) in five different flavours. The company has a fleet management department, established a year before, which manage the overall company's vehicle fleet which include a range of functions, such as vehicle financing, vehicle maintenance, vehicle trucking, fuel controlling, GPS controlling etc. The company distributed its products, mainly bottled water (Aqua Addis) and five different flavours packed soft drinks, to customer shops and exclusive agents in the country. The company delivers its products with door to door services by its vehicles to Addis Ababa and periphery retailers and exclusive agents. For the regional markets, the company's trucks are responsible to deliver to three warehouse branches (Direidawa, Hawassa and Bahir Dar) only, hence distribution to the market and customers is held by agent the company licensed agents.

The effectiveness of the research is highly dependent on the four variables main factors of fleet management where the fleet management is expected to provide efficient & effective distribution of Aqua Addis brand products to the market. Therefore, the study assessed how employee perceived the effect of fleet management functions on operational performance of the Asku PLC.

### **3.2. RESEARCH APPROACH**

The study followed both quantitative and qualitative research approaches (mixed approach) in the study in order to achieve its purpose. According to Creswell (2003) mixed methods research are used for both predetermined and emerging methods, with both open ended and closed ended questions. Hence, quantitative approach is used as the major method of analysis in which quantitative surveys were designed to fit a questionnaire schedule. Both primary and secondary data used had quantitative nature.

### **3.3. RESEARCH DESIGN**

The research was designed in both descriptive and explanatory features of study. Descriptive study allows the researcher to describe those data and helps to know the event that was taken place whereas explanatory study to examine the relationships between variables. A time horizon of 12 months was considered in the study. As a result, the study type was a cross-sectional. The cross-sectional study used to know the phenomenon of events took place by testing the relationships of variables in a given time period. Also, according to Saunders, Lewis & Thorn hill (2009) a Cross-sectional study is recommended in survey data collection method as the best to describe the incidence of a phenomenon or to examine how different factors are related.

### **3.4. POPULATION AND SAMPLE**

The population of the study are Managers/Department heads, Maintenance workers and Fleet dispatchers and Analysts & Heavy vehicle drivers of Asku Plc who are staffs in the fleet management department related to the bottling water distribution.

Table 3.1: Target populations of the study

No.	Fleet Department Organogram	Total Population Size (Heads and workers)		Total
		At Addis Ababa (head office and branches)	At Burayu office (main factory)	
1	Fleet Manager (Head office)	1	0	1
2	Maintenance (Garage) Supervision	7	1	8
3	Fleet Administrator (Head office)	1	0	1
4	Fleet dispatchers (Fuel controller/attendant)	3	1	4
	Compliance officer	1	0	1
5	Fleet Analysts	2	0	2
6	Heavy vehicles drivers	overall 100		100
Total population				<b>117</b>
Sample size				<b>67</b>

The researcher proposes, in general, the survey utilize non-probabilistic sampling techniques. Due to the nature of the problem to be researched the researcher used all the seventeen department managers and workers; and 50 (fifty) heavy vehicles drivers which has categorized and selected as sample population of the drivers.

The questionnaire distributed to those all office staffs who are cited in the above fleet management department and half of the number of heavy vehicles drivers total number as result of the availability of drivers because of their job fair. The study used a non-probabilistic convenience sampling method in which elements have been selected from the homogeneous target population on the basis of their accessibility or convenience to the researcher.

### **3.5. DATA SOURCES AND TYPES**

Both primary and secondary types of data were used in the study. The primary data was ordinal (categorical) type to help giving score on the bases of respondents' opinions. Once the aim of the study was to identify the critical factors by evaluation the score obtained, ordinal (categorical) data type found to be the right one to identify those variables based on their importance to the factors to be studied. Respondents who filled the questionnaire were a source of primary data. In the meantime, those Asku PLC fleet management data serves as a source for secondary data.

### **3.6. DATA COLLECTION PROCEDURES**

The data collection method applied for primary data was survey. Survey method provides a description of trends, attitudes, opinions of a population using primary data that is quantified. It helped the researcher to generalize about the population by studying a sample of that population (Creswell, 2009). The questionnaire was organized in Likert scale prepared in a close-ended (fixed alternative) form of questions to avoid waste of time that may be spent for editing. A closed ended form helps in standardizing alternative responses helped to compare the answers by facilitates coding, tabulating, and ultimately interpreting the data. The questioners developed by self-administered ways to identify the relationships of factors between dependent and independent variables. A funnel technique of developing questionnaires was taken in to a consideration starting respondents to answer general questions before go to specific questions in order to obtain unbiased responses.

### 3.9. METHOD OF DATA ANALYSIS

The data (both primary and secondary) analyzed separately. The primary data was ordinal in nature that needs examining of relationship between variables for ranking purpose, as a result, the test applied was a non-parametric. The data was analyzed after getting response for the questionnaires and coding before it record. All available clear response recorded to analyze using SPSS. The secondary data, on the other hand, analyzed using percentage and graphs to depict the operational performance of the company with regards to each factor being tested. But, the interpretations were given based on both (primary and secondary) findings.

In the study, a multiple regression analysis was conducted to test the influence of each of the four variables with respect to operational performance particularly the fleet efficiency performance indicator category. The research used statistical package for social sciences (SPSS V 20.0) to code, enter and compute the measurements of a multiple regressions.

Regression model: the equation was expressed as follows:

$$Y = \alpha + \beta_1 (X_1) + \beta_2 (X_2) + \beta_3 (X_3) + \beta_4 (X_4) + e$$

Where;

Y – Operational Performance

$\alpha$ - Constant (coefficient of intercept)

X1 – Maintenance and repair

X2 – Vehicles fuel management

X3 – Vehicles tracking

X4 – Driver management

e – Error term

$\beta_1, \beta_2, \beta_3, \beta_4$  – Regression coefficients for four variables.

The regression equation has established that taking all factors into account to the dependent variable performance of operational efficiency to establish and results were presented as per the SPSS generated.

### 3.7. RELIABILITY AND VALIDITY TEST

Toke *et al.* (2012) defines reliability as the extent to which results of a study are consistent over time and there is an accurate representation of the total population under study. The most common technique used literatures to assess the scales reliability and stability is use of the Chronbach Alpha Statistics which was employed to measure the reliability of the research. Chronbach Alpha should be over 0.70 to produce a reliable scale and any scale with Chronbach Alpha less than this standard should be eliminated. To ensure the measurement and assessment of the real situation in Asku plc, the researcher conducted pilot survey on the questionnaire by taking 5 employees. The Chronbach alpha result from the pilot survey is presented below.

Table3.2 reliability test

	<b>Cronbach's Alpha</b>	<b>N of Items</b>
Maintenance and repair	0.752	7
Fuel Management	0.803	6
Vehicle tracking	0.786	6
Drivers management	0.744	7
Operational Performance	0.750	5
Overall	0.767	31

Source: own survey 2019

Validity, derived from the Latin term *validitas*, meaning “strength”, is a term used in both qualitative and quantitative research. According to Trochim (1999) validity asserts that a finding can never truly be proven; it can only be argued (Kibatu, 2016). Accordingly validity of research tool has three components. The first is construct validity which deals with the consistency of the questions with the responses was intended by the researcher. This validity was assured by

structuring the questionnaire according to the specific objectives. The second form of validity is content validity which was assured using close ended questions to avoid irrelevant answers. To ensure internal validity of the questionnaire, the researcher also gave the draft questionnaire to the supervisors for review and recommendations which was made part of the final questionnaire. Construct validity was assured by rearranging the questions according the comments of the respondents in order to keep the flow of questions.

### **3.8. ETHICAL CONSIDERATION**

The researcher was applied oral an informed consent to solicit the willingness of the individual to participate on this research. The participants were given information on the purpose of the study, the time it takes, the procedures to be followed, and benefits before starting the research. It is only after getting an informed consent that the participants were required to move to the next steps. The potential participant has also been informed that he/she can refuse to answer any question and that he/she can quit the interview at any point. If the participant has any questions, the researcher was required to respond adequately. The researcher shall assure information that participants provides during the study kept confidential. The raw data set and recorded interviews shall not be used for any other purpose than the intended purposes.

## CHAPTER FOUR

### RESULTS, DISCUSSION AND INTERPRITIVE

#### 4.1 Introduction

In this chapter, the collected data from Managers, Maintenance workers and Drivers of Asku Plc at headquarter and branches are presented, interpreted and analyzed in order to realize the ultimate objective of the study. Accordingly, demographic profile of the respondent, descriptive analysis and regression analysis on the practices of fleet management of Asku Plc and factors of fleet management discussed.

In order to address the research questions, 67 questionnaires were prepared and distributed to Asku plc fleet management department employees, out of these questionnaires 54 were filled and returned, the rest 13 questionnaires were unreturned, and no questionnaires were discarded due to missing data.

#### 4.2. Response Rate

A total of 54 responses out of the 67 questionnaires sent out were received, achieving an acceptable response rate of 80.6%. All the questionnaires were edited and checked for completeness and used in the data analysis.

**Table 4.1. Overall Response Rate**

<b>SAMPLE</b>	<b>NUMBER</b>	<b>PERCENT</b>
Number of questionnaires distributed	67	100%
Returned questionnaires	54	80.6%
Total usable questionnaires	54	80.6%

Source: Survey Result,2019

### 4.3. Demographic Profile of the Respondents

Respondents were asked to report their gender, age, educational status, working experience, and their income status.

A percentage and frequency characteristic of the respondents is presented in the following table.

Table: 4.2 Demographic Information of respondents

Description		Frequency	percent
Gender	Male	54	100
	Female	0	0
	Total	54	100.0
Age	<30	25	46.3
	31-40	26	48.1
	41-50	2	3.7
	>50	1	1.9
	Total	54	100.0
Level of Education	Primary	22	40.7
	Secondary	19	35.2
	Diploma	7	13.0
	Degree	6	11.0
	Total	54	100.0
Years of Experience	<1 years	10	18.5
	1-5 years	33	61.1
	6-10 Years	11	20.4
	Total	54	100.0

**Source:** Survey spss output (2019)

Table 4.2 shows that there were 54(100%) male respondents. This implies that the study consists of all male without female respondents who were from the

department of fleet management. Furthermore, most of the respondents' age is ranged between 31-40 years old (48.1%) and 46.3% of them have the age of less or equal to 30 years. This indicates that most of the respondents are relatively adult. Around 4% of the respondents have the age ranged between 41-50 years and 2% of the respondents greater or equal to 50 years.

In relation to their qualification level, as table 4.2 illustrates 11% of the respondents were degree holders, 13% of them were diploma holders and the rest 48.1% of them were certificate holders. Table.4.2 also shows that, there were four categories of work experience; less than 1, 1 to 5, 6 to 10 and greater than 10 years. Accordingly, the first category accounts 18.5% of the respondents; the second group who had 1 to 5 years of experience was 61.1% of the respondents. The rest 20.4% of the respondents had 6 to 10 years of work experience.

#### **4.4. Descriptive Analysis**

Meseker (2018) used a kind of rule of thumb to create equal intervals for a range of five points Likert scale (that ranges from strongly disagree to strongly agree in the survey questionnaire). A calculated mean value that ranges from 1 to 1.80 implies strong disagreement, a mean range from 1.81 to 2.6, from 2.61 to 3.4, from 3.41 to 4.2 and from 4.21 to 5.00 represented respondents' perceptions of somewhat disagree, neutral, somewhat agree and strongly agree respectively. The 0.8 served as a boundary for each elements of the measurement in the questionnaire.

Accordingly, the 0.8 was a result found by dividing the difference between the maximum (5) and minimum (1) scores to the maximum score (5) of the questionnaire. In the process of examining of the data, standard deviation was used. Small standard deviations (relative to the value of the mean itself) indicate that data are close to the mean whereas a large standard deviation (relative to the mean) indicates that the data points are distant from the mean.

The mean is a poor fit of the data. Standard deviation is a measure of how well the mean represents the data (Field 2009). All of the variables were measured using a five point likert scale where 1 stands for Strongly Disagree and 5 stands of Strongly Agree. Therefore the interpretation made using the mean of each variable, as a matter of fact the mean falls between the two ranges, hence if the mean approaches to 1 the interpretation would be the respondents didn't agree on the raised issue or variable and if it approaches to 5 the reverse would be true.

#### 4.4.1. Assessment on Vehicles Maintenance and Repair Practices

Table.4.3 Vehicles Maintenance and Repair Factors

	N	Mean	Std. Deviation
The company has good manner in replacing part of equipment.	54	2.93	1.330
The company has good recording of history of vehicles.	54	3.72	1.220
There is interchanging a part with a technically more advanced part in order to make the equipment perform better.	54	3.04	1.454
In my company parts of vehicles are replacing before failure occurs.	54	1.59	1.221
In my company parts are not replaced until they have failed down.	54	4.76	.725
There is a routine servicing of vehicles in the company.	54	3.35	1.216
There is a good spare part management in the company.	54	3.09	.996
Grand Mean	54	3.21	.66117

Source: Survey spss output (2019)

Table 4.3 showed fleet management practices of vehicles maintenance and repair factors. The first factor which the respondents gave higher mean score was the question state that, parts are not replaced until they have failed down which is the mean score of 4.76 and the second practice good recording of history of vehicles. The variables routine servicing of vehicles and good spare part management in the company which is the mean score of 3.35 and 3.09, respectively, lays in agree level as important determinants of mode choice factors in the case of Asku plc. On the other hand, in the company parts of

vehicles are replacing before failure occurs as least important practice with 1.59 mean score which lays in disagree level. Accordingly, the analysis shows that maintenance and repair had a means score of 3.2, which almost the score of this variable falls between the two extremes at neutral level. Therefore, maintenance and repair were one of the anticipated variables that are assumed to affect operational performance.

#### 4.4.2. Assessment on Fuel Management Practices

Table 4.4 fuel management practices

	N	Mean	Std. Deviation
The company has potential fuel sourcing.	54	4.63	.623
Fuel operators are dedicated in monitoring fuel consumption (usage rates).	54	4.69	.469
Fuel cards are reliable as a means of monitoring fuel consumption.	54	4.74	.445
The company is experiences good in implementation of fuel consumption monitoring and reporting systems.	54	4.72	.452
There is good matching of vehicles to the transport task to manage fuel consumption in the company.	54	4.59	.599
There is a mechanism of improving tyre management in the company to fuel management.	54	4.02	1.055
Grand Mean	54	4.56	.34302

Source: Survey spss output (2019)

Table .4.4 showed that, fuel management were one of the predictable variables that are imagine to have an effect on operational performance in which five out of six fuel management factors variables and the sixth one lays in strongly agree level and agree level, respectively important determinants of mode choice factors in the case the company. The factors which the respondents gave higher mean score are the questions supposed that, fuel cards are reliable as a means of monitoring fuel consumption which is the mean score of 4.74, and the company is experiences good in implementation of fuel consumption monitoring and reporting systems which is the mean score of 4.72. Respondents gave relatively lower mean score of 4.02 for the factor of mechanism of improving tyre management in the company to fuel management

which still lays at agree level. As a result, the analysis shows that fuel management had a means score of 3.56 therefore, Fuel management were one of the predictable variables that are imagine having an adverse effect on operational performance, which indicate the score of this variable assign of strongly agree level.

#### 4.4.3. Assessment on Vehicles Tracking

Table .4.5 Vehicle tracking practices

	<b>N</b>	Mean	Std. Deviation
The company is using the vehicle tracking system for fleet management.	54	4.35	.756
The company uses well-organized routing and dispatching mechanism of vehicle tracking to monitor and control vehicles.	54	4.35	.520
The company has planned and scheduled maintenance which simplified tracking of vehicles.	54	3.20	1.009
In my company GPS vehicle tracking system has achieved as management goal for monitoring and tracking distribution.	54	4.41	.687
In my company GPS vehicle tracking system has achieved management goal for fuel saving.	54	4.54	.665
In my company GPS vehicle tracking system is achieved management goal for safety.	54	4.57	.536
Grand Mean	54	4.37	.42911

Source: Survey spss output (2019)

Table 4.5 indicates vehicle tracking were one of the variables that are assumed to change operational performance. The respondents mean scores for the questions are as follows the first request, the company is using the vehicle tracking system for fleet management which is the mean score of 4.35 & the second , the company uses well-organized routing and dispatching mechanism of vehicle tracking to monitor and control vehicles with mean score of 4.35 and the third the company has planned and scheduled maintenance which simplified tracking of vehicles which is the mean score of 3.20, which is the least score of this variable’s factor and it indicates neutral level. For the question whether the company GPS vehicle tracking system is achieved management goal for safety which accounts 4.57, is the highest score of this

variable's factor and it indicates strongly agree level. Accordingly, the analysis shows that vehicle tracking had a total mean score of 4.37 which is strongly agree it indicates that there is no somehow a gap on vehicle tracking system that the respondents positively realize the impact of vehicle tracking on the operational performance of the company.

#### 4.4.4. Assessment on Driver Management and Training

Table 4.6 driver management and training practice

	<b>N</b>	Mean	Std. Deviation
There has supervision/ planning method by ensuring that drivers understand that they are responsible and accountable for their actions.	54	4.57	.605
Drivers' behaviour and education are directly imposed with improvements in fuel efficiency and safe driving practices.	54	4.54	.636
Drivers' training is aimed at improving fuel-efficient driving and decreasing incident rates.	54	4.50	.720
There have drivers training on educating and coaching drivers about vehicle standards, maintenance and visual inspections.	54	4.13	.972
The company has an individual driver recognition/incentive scheme that rewards positive behaviours and outcomes.	54	3.87	1.245
Improving driver recruitment procedures is available for driver management.	54	3.65	.914
The company holds regular driver forums for driver management.	54	3.58	.745
Grand Mean	54	4.11	.42807

Source: Survey spss output (2019)

Table 4.6 shows that the driver management and training is one of the variables that are assumed to change operational performance. The factors that the researcher used to determine the effects of operational performance were, seven and the respondents gave higher mean score was 4.57 for supervision/ planning method by ensuring that drivers understand that they are responsible and accountable for their actions, and next higher mean score was 4.54 for rivers' behaviour and education are directly imposed with improvements in fuel efficiency and safe driving practices and third, drivers' training is aimed at

improving fuel-efficient driving and decreasing incident rates which is the mean score of 4.50 in which all of them lays at strongly agree level. Tasks of the variable, holding regular driver forums for driver management, and Improving driver recruitment procedures is available for driver management are relatively with least mean score of 3.58 and 3.65, respectively. which at agree level, there have drivers training on educating and coaching drivers about vehicle standards, maintenance and visual inspections which is the mean score of 4.13 and the company has an individual driver recognition/incentive scheme that rewards positive behaviours and outcomes which is the mean score of 3.87 are the other factors which lays at agree level. Accordingly, the analysis shows that driver management and training had a means score of 4.12, which score of this variable falls at the extreme of, agree level.

#### **4.4.5. Assessment on Operational Performance**

Table 4.7 Operational performance

	<b>N</b>	Mean	Std. Deviation
The company is able to pay for fuel cost and for what is used.	54	4.50	.841
The company has a good Speed management (regulating speed on different topographical road) to manage fuel consumption.	54	4.54	.719
The company is able to manage idling duration of trucks.	54	4.44	.664
The company is able to do its task in expected time frame.	54	4.46	.719
The company has successful fleet efficiency.	54	4.61	.596
Grand Mean	54	4.51	.50904

Source: Survey spss output (2019)

Table 4.7 indicates operational performance based on efficiency parameters factors which shows the mean range from 4.61 to 4.44 that both extremes as strongly agree level with the total mean score of 4.51 which also lies on strongly agree level which is an indication of better operational performance.

Studies confirms that fleet management practices significantly enhances the performance of an organization, therefore, based on this survey findings or

results Asku plc stood in a good position of the fleet management practices of vehicles maintenance and repair, fuel management, vehicle tracking and driver management and training factors which are the determinant factor to enhance the operational performance of the business company.

## **4.5. Regression Analysis**

### **4.5.1. Econometrics Result**

Before running the regression a pre-test of Multicolliniarity and Heteroscedsticity were performed. Accordingly, a VIF test suggested that there is no a multicollinearity problem in the data, the maximum VIF was 1.11 (see annex); in order to have a multicollinearity problem the results VIF should be greater than 10 (Gudjrat, 2003). Likewise, Breusch-Pagan/Cook-Weisberg test was performed in order to test the existence of Heteroscedsticity, fortunately, the data didn't have a problem of error term variance.

Concerning test of normality, in order to run ordinary least square method the error term or residuals must be normally distributed; therefore, p-plot technique was employed; and the residuals are nearly normally distributed. Furthermore, the assumption of linearity articulates the dependent and each independent variable should have a linear relationship. Therefore, scatter plot technique was employed to test the linearity assumption the assumptions are achieved the linearity assumption.

Table 4.8 Model summary

<b>Model Summary<sup>b</sup></b>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.331 <sup>a</sup>	.110	.307	.49954

a. Predictors: (Constant), MeanDM, MeanMaintc, MeanVehTR, MeanFM

b. Dependent Variable: MeanOPERF

Source: Survey spss output (2019)

The model summary displays the significance and percentage of variation in operational performance which is caused by independent variables.

Multiple correlations R of +0.331 represent the combined correlation of all the independent variables. Adjusted R<sup>2</sup> tells us that 30.7% of the variation in operational performance can be explained by variation in the four independent variables taken together. This leaves 69.3% unexplained.

#### **4.5.2 Estimation Result**

This study intended to investigate the effects of fleet management on operational performance in Asku bottling PLC. Particularly, how maintenance and repair, vehicles fuel management, vehicles tracking and driver management determine the operational performance of the bottled company. Furthermore, Ordinal logistic regression (Ologit) model were employed to estimate the operational performance.

The results of the econometric model estimation revealed that all variables except maintenance and repair have positive relationship with operational performance. Moreover, fuel management and vehicle tracking were found to contribute significantly and positively on operational performance, whereas, maintenance and repair contribute significantly and negatively on operational

performance. In contrast, drivers' management didn't show significant relationship with operational performance.

The positive coefficient of fuel management and vehicle tracking suggested that, as the fuel management and vehicle tracking system improve the operational performance of the company also increases its business by taking comparative advantage of its products in the market other than price competition. The other variable maintenance and repair shows negative and significant ( $p < 0.05$ ) effect on operational performance; findings shows that, the negative coefficients of this variable suggested that when there is sequence of maintenance and repair of vehicles as occurrences of failures admits the worse will be the performance. Likewise, a finding shows that, coefficients of drivers' management had a positive impact to improve the operational performance of the institute even though the impact is insignificant.

Table 4.9 ANOVA

ANOVA <sup>a</sup>					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.506	4	.377	1.509	.002 <sup>b</sup>
Residual	12.227	49	.250		
Total	13.733	53			

a. Dependent Variable: MeanOPERF

b. Predictors: (Constant), MeanDM, MeanMaintc, MeanVehTR, MeanFM  
Source: Survey spss output (2019)

In the ANOVA sub table we have the F value of 1.509 which is significant with  $p < .001$ . This informs us that the four independent variables taken together as a set are significantly related to the dependent variable.

In order to see the contribution of fleet management factors that affect operational performance, regression analysis of operational performance were employed. Table 4.10, provides the result of multiple regression analysis beta coefficient and significance.

Table 4.10 Regression coefficients

Coefficients <sup>a</sup>						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	2.479	1.324		1.872	.067
	MeanMaintc	-.110	.105	-.143	-1.042	.023
	MeanFM	.131	.208	.088	.628	.033
	MeanVehTR	.340	.164	.287	2.072	.044
	MeanDM	.073	.169	.061	.432	.107

a. Dependent Variable: MeanOPERF

### 4.5.3. Regression model

Regression model: the equation was expressed as follows:

$$Y = \alpha + \beta_1 (X_1) + \beta_2 (X_2) + \beta_3 (X_3) + \beta_4 (X_4) + e$$

The above table gives the results for the regression coefficient for the multiple linear equation;  $(Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon)$  which by supplying the coefficients becomes:

$$Y = 2.479 - 0.143MMR + 0.088MFM + 0.287MVT$$

Where: Y= Operational performance

According to the regression equation established, holding all independent factors constant, then operational performance will be 2.479 units. From the regression equation holding all other independent variables constant, a unit increase in maintenance and repair will lead to a 0.143 decrease in operational performance; a unit change in vehicles fuel management will lead to a 0.088

unit improvement in operational performance; a unit increase in vehicles tracking system will lead to a 0.287% increase in operational performance. However, at 5% level of significance and 95% level of confidence, maintenance and repair, vehicles fuel management and vehicles tracking have a significance influence on the company operational performance with p-values of 0.023, 0.033 and 0.044, respectively. The P-value associated with the coefficient for driver management is 0.107, an implication that though driver management has an influence on the operational performance, its effect is insignificant.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

The final part of this research paper provides summary, conclusions and recommendations drawn from the findings of the data collected by questionnaire.

#### **5.1 SUMMARY OF FINDINGS**

ASKU PLC is one of the companies operating under the food and beverages group Asku & Berhane Investment Group (ABIG) established in 1999 by Ethiopian shareholders, is a company engaged in the manufacturing sector with the aim of becoming the largest food and Beverage Company in the country. Currently, the company is producing Bottled Water under the brand name - Aqua Addis; Carbonated Soft Drinks (CSD) in five different flavours namely RC Edge, RC Cola, RC Orange, Royal Tonic and RC Lemonade and Juices under the brand name Ethiopicana.

Hence, to achieve the aim of the company efficiently and effectively, it has to a well-organized Fleet management and fleet efficiency system in order to enhance every business' objective of profitability and competitiveness.

The research was anticipated to investigate the effect of fleet management practices on operational performance of Asku PLC, on its bottled water products. Four main variables were used to evaluate the impact on operational performance which includes; maintenance and repair, vehicles fuel management, vehicles tracking system and driver management and training. In order to achieve these objectives, data were collected from the employees of the company and processed in both quantitative and qualitative approach of descriptive approach and also used regression analysis.

Based on the analysis and interpretation of the data obtained from primary and secondary data sources, the researcher has come up with the following findings.

- ❖ Maintenance and repair and operational performance are significantly associated. The mean score of this variable is 3.21 (in neutral level) which indicates that there was a gap while following the maintenance and repair fleet management practices. While the operational performance of the company is dependent on this variable and the result shows that a unit change on maintenance and repair has 0.110 decreasing effect on operational performance of the company keeping other variables constant.
- ❖ Fuel management: descriptive analysis shows that the mean score of the fuel management lays between 4.02 and 4.74 between agree and strongly agree level. The implication was that fuel management in the company was strongly attached to an improvement in operational performance. From the regression analysis the operational performance of the company is dependent on this variable since it has significant effect on the operational performance. A unit change in service quality has 0.131 incremental effect on operational performance keeping other variables constant.
- ❖ As for the effect of vehicle tracking on operational performance, the view from respondents was also given a bold respond since the mean score is 4.37 which lays at strongly agree level. A unit change in this variable has 0.340 increasing effect on the operational performance keeping other variables constant.
- ❖ Drivers' management: result from respondent view indicates that the overall mean score is 4.11, which indicates the respondents are agree for the drivers management and training. From the regression analysis the

operational performance of the company is not dependent on this variable since it has insignificant effect on the operational performance.

Furthermore, the value of regression analysis shows that the results of the model estimation revealed that, fuel management, and vehicle tracking had positive and significant effect on operational performance, maintenance and repair had negative and significant effect on operational performance, whereas, drivers management didn't show significant relationship with operational performance.

## **5.2. CONCLUSION OF FINDINGS**

Under this study, the major determining factors of operational performance identified were fleet management practices based on the response of employees which composed of four dimensions; maintenance and repair, fuel management, vehicle tracking and drivers management. Four research questions were developed and addressed in this research and unfortunately all the dimensions were rated above the average mean value of 2.5. In other words, it shows the strong existence of operational performance in the company which indicates that; the study has revealed that the organization fleet management practices are in a good manner.

As per the regression equation established, holding all independent factors constant, then operational performance will be 2.479 units. From the regression equation holding all other independent variables a constant, a unit increase maintenance and repair will lead to a 0.110 decrease in operational performance; a unit change in fuel management will lead to a 0.131% increase in operational performance; and a unit increase in vehicle tracking will lead to a 0.340% increase in operational performance. However, at 5% level of significance and 95% level of confidence, maintenance and repair, fuel management and vehicle tracking influence on the organizational performance with p-values of 0.023, 0.033 and 0.044 respectively. The P-value associated with the coefficient for drivers management is 0.107 an implication that though

relationship has a positive influence on the operational performance, its effect is insignificant.

The results further infers that of all the predictors considered in this study vehicle tracking contributes the most to the operational performance followed by fuel management as implicated by their larger coefficients.

### **5.3. RECOMMENDATIONS**

By relying on the study findings, the researcher suggests the following points as credible recommendations to the problem. Based on the objectives and conclusions this study recommended as follows:

Based on the first objective on maintenance and repair, the company can use serious control mechanism on genuine spare parts and interchanging a part with a technically more advanced part in order to make the equipment perform better.

Based on the objective on fuel management and vehicle tracking system, there should focus on driver training; speed management; improving fleet management practices; improving in-cab temperature control; matching vehicles to the transport task. The company could also effectively use the GPS vehicle tracking system to achieve management goal for monitoring and tracking distribution, speed limit, fuel saving and safety.

Based on the last objective on drivers' management and training, the fleet managers should take careful actions on ensuring that drivers understand that they are responsible and accountable for their actions, improving driver recruitment procedures, educating and coaching drivers about vehicle standards and visual inspections.

Besides, holding regular monthly driver forums and encouraging honest reporting and the company has to motivate drivers because motivation and reward plays a significant role for any organizational culture.

#### **5.4 SUGGESTED FUTURE RESEARCH**

The fleet management functions may have other variables which can affect the operational performance of the company. Therefore, including other variables and performing the research will give a better result. This research is more quantitative, and it will be a base for qualitative research which can be determined by observation to gather non-numerical data. Finally, the researcher strongly recommend other researchers to conduct further investigation on what models best describe Fleet management factors on operational performance taking measurable indicators in form of Key Performance Indicators (KPI) other than the fleet efficiency. The study was relying by taking sample KPI types from one of the KPI categories, efficiency KPI category to measure operational performance.

## References

- Baas, PH. (2012) Fleet management commitment to fuel efficiency. *NZ Transport Agency research report 482*. 65pp.
- Borirug, S., Fung, C. & Philuek, W. (2009) A Study On The Requirements And Tools For Real Time Fleet Management E-Business Systems In Thailand. *The 8th International Conference on e-Business (iNCEB2009); October 28th-30th*; School of Information Technology, Murdoch University
- Chalachew Adege (2010) Assessment Of Marketing Strategy Practices In The Case Of St. George Brewery(BGI); Addis Ababa University. A Research Project Submitted In Partial Fulfillment Of The Requirements For The Degree Of Masters In Business Administration (MBA).
- Creswell, J. W. (2009) *Research design: Qualitative, quantitative, and mixed methods approaches*. 3rd edition, published by SAGE Publications, Inc., USA
- Emmanuel, D. S. & Danladi B. (2016) Assessment of trace elements in selected bottled drinking water in Ghana: A case study of Accra metropolis. Department of Geological Engineering, Faculty of Engineering, Muğla Sitki Koçman, University Turkey
- Fekadu, M. Debelu. (2013) Logistics Practices in Ethiopia. *Swedish University of Agricultural Sciences*. Independent thesis: ISSN 1654-9392
- Field, A. (2009) *Discovering statistics using SPSS*. 3rd edition, sage publication Ltd.
- FU, J. (2017), *Evaluating and Improving the Transport Efficiency of Logistics Operations*, Doctoral Thesis in Transport Science With specialization in Transport Systems, Department of Transport Science KTH Royal Institute of Technology SE-100 44 Stockholm, Sweden.
- Gitahi, M. P. & Ogollah, K (2014) Influence of Fleet Management Practices on Service Delivery to Refugees in United Nations High Commissioner for

- Refugees Kenya Programme. *European Journal of Business Management*, 2 (1), 336-341.
- Gujarati, D. N. (2003). *Basic Econometrics* (Fourth Ed). New York: McGraw-Hill/Irwin.
- Hamzi, R., Bourmada, N. & Bouda, M (2013) Fleet management: Assessment of the best practices. *Compiègne, France*. <hal-00823122> Available from: <https://hal.archives-ouvertes.fr/hal-00823122> [Accessed 10th Oct 2018].
- <http://www.abig.com.et/CompanyProfile.aspx#> viewed on 26 December 2018 @ 8:08 EAT
- <http://www.thefreedictionary.com/et+al> viewed on 27 Feb 2019 @ 14:05 EAT
- Kibatu, S. (2016) Assessment of Fleet Management Practices of Pharmaceuticals Fund and Supply Agency of Ethiopia. Addis Ababa University, School Of Commerce Logistics And Supply Chain management
- Kothari, C.R. (2004) *Research Methodology: Methods and Techniques*. Second Revised Edition, Published by New Age International (P) Ltd, New Delhi
- Kuehling, R. (2018) six reasons to switch from vehicle tracking to package tracking. Available from: <http://blog.roambee.com/supply-chain-technology/author/rainer-kuehling> [Accessed 10th Oct 2018].
- Meseker, B., (2018) The Effect of Fleet Management on Fleet Efficiency From the Perspective of Employee (the case of WHO Ethiopia). Addis Ababa University, School Of Commerce Logistics And Supply Chain management
- Murthy, D.N.P., Atrens, A., J.A. Eccleston, (2002), Strategic maintenance management, *Journal of Quality in Maintenance Engineering*, Vol. 8 Iss 4 pp. 287 – 305
- Oracle Corp. (2017) Information and Procedure for System Administrators to use fleet monitoring. Available from: <http://docs.oracle.com/oracle>

[IoT Fleet Monitoring cloud service,19.1.5/author/rainer-kuehling](https://doi.org/10.1007/s13676-012-0001-1)

[Accessed 20th April 2019]

Pedraza-Martinez, A. J. and Wassenhove, L. N. V. (2012) Transportation and vehicle fleet management in humanitarian logistics: challenges for future research. INSEAD Faculty & Research Working Paper, Springer-Verlag + EURO - The Association of European Operational Research Societies 2012, DOI 10.1007/s13676-012-0001-1.

Pfeifle, S., Ley, C., Tauschek, F. & Enderle, P. (2018) Fleet management in Europe: Growing importance in a world of changing mobility. Available from: [http:// www2.deloitte.com](http://www2.deloitte.com) 7Nov2018 issue 7/2017 [Accessed 9th Oct 2018].

Saunders, M., Lewis, P. & Thornhill, A. (2009) *Research methods for business students*. 5th Edi. Pearson education limited, England

Small, M., Bailey, T., Lydon, M., & DavernT. (2016) Fleet Management; Best Practice Fleet Management And Priority Actions, MAINTENANCE MANUAL/ Fleet Management.

Sorensen, C. G. and Bochtis, D. D. (2010) Conceptual model of fleet management in agriculture. *Biosystems Engineering*, vol. 105, no. 1, pp. 41–50.

Sunkari, E.D., and Danladi, I.B. (2016) Assesment of trace elements in selected bottled drinking water in Ghana: A case study of Accra metropolis, Department of Geological Engineering, Faculty of Engineering, Muğla Sitki Koçman University Turkey

Toke, L. K., Gupta, R. C., & Dandekar, M. (2012). An empirical study of green supply chain management in Indian perspective. *IJASER*, 1(2), 372-383.

Waiyaki, E. C. (2013) Leveraging Technology for Business Fleet Applications: A Case Study Of Fleet Management System Implemented In Kenya Power & Lighting Company Limited. University Of South Africa;

Transport Economics Department, thesis for the degree of master of commerce.

Welansa, B., (2018) How Employee Perceive the Effect of Outsourcing Fleet Management Functions on the Operational Performance of ILRI. Addis Ababa University, School Of Commerce Logistics And Supply Chain management

## **APPENDICES**

### **APPENDIX I: RESEARCH QUESTIONNAIRE**

**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF COMERCE GRADUATE PROGRAM**  
**MASTERS IN LOGISTICS & SUPPLY CHAIN MANAGEMENT**

#### **QUESTIONNAIRE**

A survey questionnaire to assess fleet management practices of bottled water companies in relations with its implication for operational performance in the case of Aqua Addis bottled Water Company (ASKU PLC).

Dear Respondents;

This questionnaire is designed to collect data on fleet management practices in bottled water companies that have strong impact on the operational performance of the ASKU PLC, Aqua Addis bottled Water Company. The purpose of the study is totally academic that is intended to fulfill a requirement for Masters of Art (MA) Degree in Logistics and Supply Chain Management at Addis Ababa University.

Respondents are encouraged to use either "X" or "√". All information will be kept confidentially and respondents are not allowed to write their name on any of the pages. Your genuine, frank and timely response are much appreciated as it is a base for realistic and sound research work.

Filling the questionnaire will not take more than five minutes. Hence, the researcher would like to extend precious gratitude's in advance by requesting respondents to complete the survey as soon as possible. The questionnaire has a total of **four** pages that printed on both side. Respondents' can forward anything that needs clarification from the researcher using 0911-554346 (cellphone) and ambayetsge@gmail.com.

**Thank You & Regards**

**Tsige Ambaye**

## **Part I**

### **Personal data**

1. Gender

Male

Female

2. Age Range

Less than 30

31-40

41 -50

above 50

3. Highest Level of education

Attained Primary School

Secondary School

College diploma

University level

Masters degree

PhD

4. Years of service in Asku Plc /ABIG/

Less than1 year

1 - 5 years

6 to 10 years

More than 10 years

5. Monthly salary

1000-3000

3001-5000

5001-7500

7501-10,000

10,001- 15,000

15, 001 & above

## Part II

Please rate the Fleet management factors listed below by ticking (✓) the degree/scale of your agreement on the boxes provided.

Rate below statements as:

**1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neutral,**

**4 = Somewhat Agree and 5 = Strongly Agree**

Note: you are expected to Rate the different factors of Fleet management on your company fleet management practices and hence operational performance.

<b>1</b>	<b>Maintenance and Repair Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1.1</b>	The company has good manner in replacing part of equipment.					
<b>1.2</b>	The company has good recording of history of vehicles.					
<b>1.3</b>	There is interchanging a part with a technically more advanced part in order to make the equipment perform better.					
<b>1.4</b>	In my company parts of vehicles are replacing before failure occurs.					
<b>1.5</b>	In my company parts are not replaced until they have failed down.					
<b>1.6</b>	There is a routine servicing of vehicles in the company.					
<b>1.7</b>	There is a good spare part management in the company.					
<b>2</b>	<b>Fuel Management Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

<b>2.1</b>	The company has potential fuel sourcing.					
<b>2.2</b>	Fuel operators are dedicated in monitoring fuel consumption (usage rates).					
<b>2.3</b>	Fuel cards are reliable as a means of monitoring fuel consumption.					
<b>2.4</b>	The company is experiences good in implementation of fuel consumption monitoring and reporting systems.					
<b>2.5</b>	There is good matching of vehicles to the transport task to manage fuel consumption in the company.					
<b>2.6</b>	There is a mechanism of improving tyre management in the company to fuel management.					
<b>3</b>	<b>Vehicle Tracking Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>3.1</b>	The company is using the vehicle tracking system for fleet management.					
<b>3.2</b>	The company uses well-organized routing and dispatching mechanism of vehicle tracking to monitor and control vehicles.					
<b>3.3</b>	The company has planned and scheduled maintenance which simplified tracking of vehicles.					
<b>3.4</b>	In my company GPS vehicle tracking system has achieved as management goal for monitoring and tracking distribution.					
<b>3.5</b>	In my company GPS vehicle tracking system has achieved management goal for fuel saving.					
<b>3.6</b>	In my company GPS vehicle tracking system is achieved management goal for safety.					
<b>4</b>	<b>Driver Management and Training Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>4.1</b>	There has supervision/ planning method by ensuring that drivers understand that they are responsible and accountable for their actions.					
<b>4.2</b>	Drivers' behaviour and education are directly imposed with improvements in fuel efficiency and safe driving practices.					
<b>4.3</b>	Drivers' training is aimed at improving fuel-efficient driving and decreasing incident rates.					
<b>4.4</b>	There have drivers training on educating and coaching drivers about vehicle standards, maintenance and visual inspections.					
<b>4.5</b>	The company has an individual driver recognition/incentive scheme that rewards positive behaviours and outcomes.					
<b>4.6</b>	Improving driver recruitment procedures is available for driver management.					
<b>4.7</b>	The company holds regular driver forums for driver management.					
<b>5</b>	<b>Operational Efficiency</b>					

<b>5.1</b>	The company is able to pay for fuel cost and for what is used.					
<b>5.2</b>	The company has a good Speed management (regulating speed on different topographical road) to manage fuel consumption.					
<b>5.3</b>	The company is able to manage idling duration of trucks.					
<b>5.4</b>	The company is able to do its task in expected time frame.					
<b>5.5</b>	The company has successful fleet efficiency.					

**Thank you!!**

### **Test of Multicollinearity**

A VIF test was used to test the existence of multicollinearity problem. The results of the test indicate the highest VIF is 1.111; which indicate the model performed with no major multicollinearity problem among the explanatory variables.

<b>Variable</b>	<b>VIF</b>
Maintenance and repair	1.031
Fuel Management	1.084
Vehicle tracking	1.057
Drivers management	1.111
Mean VIF	1.071

Source: Own survey, 2019