GREEN LOGISTICS PRACTICES AND PERFORMANCE OF LOGISTICS FIRMS IN KENYA
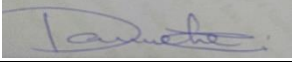
MUTUA DANIEL MUTIE

A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

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DECLARATION

This thesis is my original work and has not been submitted for examination for a degree in this or any other university.

Signed:_____Date: _ _17/08/2021___   __

Mutua Daniel Mutie

D80/60525/2013

This thesis project has been submitted for examination with our approval as the university supervisors.

Signed: _____Date: ___20/08/2021_____

Dr. Stephen Odock,

Senior Lecturer, Department of Management Science,

School of Business, University of Nairobi

Signed:_____ Date:_24/8/21_____

Prof. Kate Litondo,

Associate Professor, Department of Management Science,

School of Business, University of Nairobi

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DEDICATION

To God Almighty for His faithfulness upon my life.

To my dear family, wife Ann, son Mutua, dad Mr. Titus M. Mutie, mum Mrs. Agnes

T. Mutua, thank you very much for always being there for me. God bless you all.

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ABBREVIATIONS AND ACRONYMS

AVE   Average Variance Extracted

CB-SEM   Covariance Based-Structural Equation Modelling

CFA   Confirmatory Factor Analysis

CFI   Comparative Fit Index

CNG   Compressed Natural Gas

CO$_2$ Carbon Dioxide

CSIR   Council for Scientific and Industrial Research

EFA   Exploratory Factor Analysis

EMP   Environmental Management Programmes

EMS   Environmental Management System

GDP   Gross Domestic Profit

GHG   Green House Gas

GLP   Green Logistics Practices

GNP   Gross National Product

GoK   Government of Kenya

GSCM   Green Supply Chain Management

LNG   Liquefied Natural Gas

LSPs   Logistics Service Providers

MDGs   Millennium Development Goals

NCCAP   National Climate Change Action Plan

NESC   National Economic and Social Council

NRBV   Natural-Resource-Based View

OECD   Organization for Economic Co-operation and Development

PLS-SEM   Partial Least Squares-Structural Equation Modelling

RBV   Resource Based View

RDT   Resource Dependence Theory

RMSEA   Root Mean Square Error of Approximation

SDGs   Sustainable Development Goals

SEM   Structural Equation Modelling

SMEs   Small and Medium Enterprises

SNC   Second National Communication

SRMR   Standard Root Mean Square Residual

SSCM   Sustainable Supply Chain Management

TBL   Triple Bottom Line

UNFCCC   United Nations Framework Convention on Climate Change

VIF   Variance Inflation Factor

VRIN   Valuable, Rare, Inimitable and Non-Substitutable

WRI- CAIT   World Resources Institute Climate Analysis Indicators Tool

ABSTRACT

Emissions from the logistics industry are rising at a greater rate than any other industry and the trend is projected to continue such that by 2030 these levels will be 80% higher than they were in 2007 unless there is a change. Many firms aim at reducing cost and they need to strike a balance between social, economic, and ecological factors for sustainability. Taking measures about ecological concerns in a socially responsible way is becoming a vital part of the modern organization agenda. The main aim of this research was establishing the effect of green logistics practices implementation on the performance of logistics firms operating in Kenya. Explicitly, this study assessed how firm characteristics, economic, environmental, and social performance influence the connection between green logistics practices and firm performance. Six broad hypotheses were developed to realise the objectives. The research was guided by the philosophy of positivism and it applied the cross-sectional survey research design. The population of interest consist of 892 logistics firms in Kenya from which a sample of 300 firms was drawn. Primary data was collected from logistics executives using a structured questionnaire. A response rate of 71 percent was achieved. Data were analysed using covariance-based structural equation modelling (CB-SEM). The study findings are that, first, there is a significant positive association between the implementation of green logistics practices and performance of logistics firms in Kenya. Second, firm size and possession of an EMS certification had a significant negative moderating effect on the connection between green logistics practices and firm performance while firm ownership status was established to have an insignificant moderating influence to the link. Third, environmental performance negatively mediates the positive link between green logistics practices and firm performance while economic and social performance positively mediate this relationship. Lastly, the study established a significant joint effect of green logistics practices, firm characteristics, environmental performance, economic performance, and social performance on firm performance. This study has established that firm performance will be improved if economic performance and social performance are enhanced after implementing green logistics practices. Besides, it demonstrated that positive environmental performance plays a critical role in accomplishing successful social performance, which in turn improves firm performance. This research gave empirical proof that the execution of green logistics practices results in enhanced firm performance because the firm builds a causally vague and socially complex resource that is hard to duplicate which is in line with the natural resource-based view. The study recommends that logistics firms in Kenya should implement environment-friendly practices both within firms and in the wider supply chain beginning with green packaging, route optimization, fuel efficiency, carbon emission measurement and reverse logistics. The study provides useful information to national policymakers. From a government standpoint, motivating organizations to go green is a smart choice given that green logistics practices have a positive influence on firm performance and will, therefore, contribute to economic growth and development. The research provides to future researchers alternative practical methodological and conceptual direction that can be adopted in cross-examining other variable connections in this area of research.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Environmental concerns have become essential for organizations given the current context of globalization. Industrialization and consumerism are ever-growing bringing in a scenario where trade pursuit of humans has begun to spread unfavourable environmental impact (Ratnajeew & Bandara, 2015). There are several sources of environmental pollution by firms, which include energy generation, manufacturing, and transportation. Transportation and logistics operations are the most widely recognized to affect the natural environment in the greatest negative way (Martinsen, 2011). Wu and Dunn (1995) indicated environmental issues caused by logistics pose a threat to global quality of life, which include; ozone layer depletion, rain forests rapidly disappearing and water pollution. Transportation practices chiefly add to the ecological problem through noise and air contamination. The greater focus now is on ecological pollution through logistics practices.

Transport suppliers and associations have taken diverse initiatives aimed at diminishing the natural effect of logistics and transport activities (Ratnajeew & Bandara, 2015). In the past decades, acting in line with ecological concerns in a socially accountable way has become a vital part of the modern organization agenda. Green logistics, which is about producing and sustainably distributing goods, takes centre stage on this agenda (Murphy & Poist, 2003). Appealing to firms to embrace green logistics practices begins by discovering the enhancements these practices are likely to bring, not just on the economic aspect but also on other aspects like the environmental and social image of the firm. Firms need to know the firm characteristics that enhance greenness. They also need to know how the specific aspects affect the general performance of the organization. Most of the studies

reviewed have not exhaustively looked at the four dimensions of firm performance and have a limited focus on the green logistics practices. Hence, a study with a wider focus on green logistics practices and performance is called for.

The theories advanced to describe the link between green logistics practices and firm's performance are resource-based view (RBV), the natural resource-based view (NRBV), stakeholders' theory and the Triple Bottom Line (TBL). The emphasis of RBV is that the principal determinants of organization performance and competitiveness are its assets. The NRBV argues that competitive edge and strategy can be fashioned from capabilities facilitating economic activities, which are environmentally sustainable (Hart, 1995). Stakeholder's theory recommends that organizations create externalities, which affect numerous parties who are both external and internal to the organization. It recognizes the fact that other than shareholders, there are people or groups who the firm is committed to and who are prone to be specifically affected by the moves made by it or have an unequivocal legally binding relationship with it (Sarkis, Zhu, & Lai, 2012). Markley and Davis (2007) point out that as companies endeavour to reduce cost, the Triple Bottom Line (TBL) is imperative since it strikes an equilibrium between economic, social, and ecological factors for sustainability.

A developing country like Kenya faces great challenges in its attempt to ensure there is a balance between environmental sustainability and development. The recent ban on plastic bags by the Government poses a challenge in packaging. Some of the environmental challenges Kenya is facing are pollution, deforestation, global warming causing climate change, land degradation, waste management among others (Ministry of Environment and Forestry, 2021). Climate change effects can undermine

and even undo the progress made in attaining both the millennium development goals (MDGs) and the sustainable development goals (SDGs) in improving the socio-economic wellbeing of the Kenyan people as envisioned in Kenya's vision 2030 blueprint for development (National Economic and Social Council, 2008).

The greening of fleets, particularly trucks, is increasingly attracting the interest of logistics firms in developed countries (Bae, Sarkis, & Yoo, 2011). Many Kenyan firms are yet to fully understand the impact of environmental conservation, especially in the logistics sector. Rao (2007) observed that, in comparison to firms in developed countries, the developing countries ones are on the learning stage on how to integrate green practices in their daily operations. As such, there is a need for activities such as implementing green logistics practices, especially by the players in the logistics sector.

1.1.1 Green Logistics Practices

Kutkaitis and Župerkienė (2011) define green logistics as a structure grounded on energy consumption efficiency and less environmental harm while intensifying competitiveness and labour efficiency. A critical look at this definition seems to suggest that the context of the application for green logistics is not highlighted. Context is important in providing clarity of the application of green logistics concept. Guochuan (2010) defines green logistics as a structure fashioned in line with human interests and needs and indicating trends towards implementing a sustainable development strategy. Again, this definition leaves out the application context of green logistics practices. Srivastava (2007) gives another definition, which states that green logistics is an effort based on putting together measures centred on producing efficient energy consuming logistics system, which is less environment polluting.

However, Čepinskis and Masteika (2011) in their definition of green logistics indicated it to encompass four fields of implementation: raw material mining, energy consumption, distribution, and manufacturing (production). Green logistics practices consist of activities that are associated with the eco-efficient organization of the reverse and forward flows of information and products from the original point and the consumption point to meet or exceed customer expectations. Carter and Easton (2011) highlighted that green logistics emphasize the incorporation of ecological goals into the specific value chains and systems of the organization to give total value to consumers. This definition captures the whole area of green logistics practices in the supply chain and it is the definition adopted by this study.

Green logistics has several practices, which include green packaging, fuel efficiency, route optimization, carbon emission measurement and reverse logistics (Wu & Dunn, 1995; Rao 2007; McKinnon, Browne, & Whiteing, 2012; Molina-Besch & Pålsson 2014; Hampus & Henrik, 2014; Weng & Chen, 2015). The practices were chosen because of the impact they have on the logistics sector and the capability of their logistics operations becoming greener. Green packaging is the usage of packaging optimization technique, which is important for logistical organizations to reduce their environmental impact. When organizations are implementing their environmental programs, it becomes important to reduce solid waste like metal scrap, materials, packaging and organic waste. Thirty-three per cent of the waste stream comes from packaging material, which indicates that it is important to have programs in green packaging to have the ability to decrease an organization's carbon footprint effectively (Min & Galle, 2001). Based on earlier green logistics research (Wu & Dunn, 1995; Laosirihongthong et al., 2013; Molina-Besch & Pålsson 2014), possible indicators for the green packaging construct are shown in Appendix III (a).

A tool that can be friendly to the environment and efficient is using improved fuel-efficient fleets. Fuel efficiency can be enhanced by using proper maintenance programs, eco-driving techniques and alternative fuels. Logistics greenness can be increased by shifting to more efficient and eco-friendly fuels. Wu and Dunn (1995) identified safer, cleaner and more accessible alternative fuels compared to diesel, which consisted of liquefied natural gas (LNG) and compressed natural gas (CNG) which is cheaper than petrol by 40 per cent. Consequently, there ought to be a shift by logistics companies to the usage of alternative fuels if they want to have an environmentally sustainable future.

Another method of enhancing fuel efficiency is by using an eco-driving technique, which aims at decreasing fuel consumption. Drivers are trained on how to save fuel without a loss in mobility. There is a possibility of saving up to 25% of fuel consumption. Firms can monitor driving behaviours and fuel consumption of each truck using a tracking system which can inform them of unnecessary or excess usage of vehicles, unauthorized use of a private vehicle, driving behaviours which are poor, fuel wastage and drivers speeding and idling (Janota, Dado, & Spalek, 2010). Another major environmental issue is proper maintenance of the trucks in an efficient and safe condition, which does not only extend the vehicle lifetime but also improves the efficiency of the vehicle and reduce the rate of accidents (Wu & Dunn, 1995). From previous research done by Hampus and Henrik (2015), fuel efficiency potential indicators are shown in Appendix III (b).

Optimization of routes has to do with the coordination of a fleet of vehicles, which has a capacity that is fixed in the most possible efficient way, which gets a feasible solution that reduces the voyage amount; time travelled in total and the vehicle

numbers in use to the minimum. Ecologically responsible logistics companies would have better space utilization, more direct routes, fewer shipments, less handling and shorter movements (Wu & Dunn, 1995). The above issues lead to lower pollution levels because automobiles travel at the best efficient paces that are friendlier to the environment and consume less fuel. Therefore, optimization of routes is an expense reducer because of minimization of travelled distances and economical vehicle usage. According to Sbihi and Eglese (2010), organizations can achieve route optimization by making sure that vehicles heading to congested routes are redirected to faster and more efficient routes which many a time brings the implication that the suggested route leads to an increase of the length of total travel other than the use of a shorter route that is less efficient.

Janota et al. (2010) suggest that tracking systems can be used to optimize routes and have the ability to monitor a vehicle when it is off the track. The technology can choose the fastest route, foresee and avoid collisions and optimize the routes by using traffic reports and reduce carbon emissions of trucks. Optimization of routes was a vital feature to study because of its large potential to impact on carbon emissions and it is a simple action for logistics chain optimization, cost reduction and environmental footprint. It is important to have an information system, which is good, and management ideas, which are innovative to enhance routing efficiency for carbon emissions reduction (Wu & Dunn, 1995). Based on previous research (Weng & Chen, 2015; Lars, Hampus, & Henrik, 2015), possible indicators of optimization of routes are shown in Appendix III (c).

Logistics companies measure emissions, which come from their activities. Transportation actions produce the largest carbon dioxide emissions within the

logistics industry (Wolf & Seuring, 2010). If a company measures the logistics' chain emission, it can reduce the associated expenses and on the environmental impact by checking the areas of emission and unnecessary waste to reduce it. Pollution prevention is the ability to not just reduce the company's overall effect on the environment, but also cost, enhancing overall efficiency and effectiveness of the firm (Hart & Ahuja, 1996). They continue to posit that by removing waste and optimizing operations logistics companies can prevent pollution. The conclusion they make is that there is a benefit of being green because it cuts down on cost and efficiency is increased. Though there is an initial investment required, it is advantageous in the long run to be ecologically friendly. When companies discover and analyze their logistics chains they receive knowledge of areas they can achieve waste reductions and areas of inefficiency.

It is not only important to enhance supply chains but it is also paramount to do carbon emission measurements to discover the green initiative's effects and give out the information on their effects. It is usually a company policy decision and it is done above the managers. Although according to a study done by Piecyk and McKinnon (2010) which indicate that logistics supervisors are increasingly gaining awareness on issues to do with the environment, they conclude that organizations must understand carbon emission measurement and management specifically from road operations. Environmental performance of organizations and the ecological impact is monitored and measured by guidelines issued by the ISO 14001 who certify the firms on compliance to the guidelines (Mollenkopf, Stolze, Tate, & Ueltschy, 2010). Carbon emission monitoring practices based on previous works by McKinnon, Cullinane, Browne, and Whiteing (2012) are shown in Appendix III (d).

The reverse logistics concept is stated as material movement from the consumption point to the original point. It is different from forward logistics which specifically refers to transport from the original point to the consumption point (Rogers & Tibben-Lembke, 2001). Therefore, the approach intends to utilize transports fully and decrease the number of empty return freights. They further stated that the vehicles making a return from the consumption point are involved in, reusable packaging, remanufacturing and recycling. This illustrates how the flow of goods and reverse logistics fits into the supply chain. A case in point would be using reverse logistics to recycle used and old computers, after delivering new model computers by use of forward logistics. Wu and Dunn (1995) argue that there is an increase in two-way freights and this can only increase into the future because of returnable and reusable packaging. They continue to posit that there is a need for supply chains to have the capacity to adapt to this increase and reverse logistics raises costs because of the extra storage and handling. Entirely there will be a reduction in the logistics cost since manufacturers add returnable packaging cost, so there is a minimization of disposal cost given that the package can be used several times (Wu & Dunn, 1995).

Since reverse logistics entails recycling and reusable packaging, there is a direct impact on carbon emissions and a chance of reducing the ecological impact of a logistics company. Girdauskiene and Mihi-Ramirez (2013) indicate that a challenge often faced in reverse logistics is information dissemination and an important feature when this action is being implemented is good information management to aid managers in the process of making decisions. Reverse logistics is a means that can be initiated into a green logistics programme. To ensure that there are no empty return fleets, it is important to use reverse logistics technique, as it will ensure that trucks are utilized on both journeys. Nevertheless, Remko (1999) alludes that, reverse logistics

is insufficient on its own, as logistical chain as a whole requires evaluation when executing green supply chain programs. Although there is the argument that it is not enough on its own, the author emphasized that reverse logistics is a vital aspect to evaluate in Kenya. This is because it is a component that has cost reduction capacity and reduces logistics' environmental impact. Indicators of reverse logistics as supported by previous research (Wu & Dunn, 1995; Krumwiede & Sheu, 2002; Rao & Holt, 2007) are shown in Appendix III (e).

1.1.2 Firm Characteristics

Firm characteristics are related to organization resources and organizational aims, which are analyzed using three criteria; structure, capital, and market (Kisengo & Kombo, 2012). Structural characteristics include size, age, and ownership of the firm. Kipesha (2013) indicates that a majority of studies have centred on structural criteria because it is more linked to firm performance than the rest. This study considered firm size, ownership, and presence of an environmental management system (EMS) as the specific firm characteristics that affect the relationship between green logistics practices and firm performance

Generally, size in terms of both infrastructure and employees is an important characteristic likely to affect green logistics practices implementation. Large organizations have a greater level of innovativeness compared to small ones because they have more capital and resources in comparison to the small firms (Lee, Lau, & Cheng, 2013). Implementation of green innovations might be positively related to firm size this is because greater size leads to economies of scale enhancing the possibility of green innovation implementation (Moch & Morse, 1997). Stock (1998) revealed that economies of scale considerably impacted ecological programs.

Therefore, the larger the organization the higher the accumulated benefit from the implementation of green logistic practices because of the greater probability of recovering the startup investment. Yazdanfar and Öhman (2014) point out that firm size influences the firm's ability to put together resources required for environmental initiatives implementation and that the size also affects the performance of the firm.

Firm ownership signifies a source of authority that a firm can use to support decision-making. This is so especially in countries with weak legal structures where safeguarding the investors' interests takes centre stage (Fazlzadeh, Hendi, & Mahboubi, 2011). Calza, Profumo, and Ilaria (2014) point out that ownership structure matters in firms' environmental proactivity. Firms with an environmental management system are involved more in green initiatives compared to ones without due to the systems requirements (Hassan, Balan, & Prakash, 2016).

1.1.3 Environmental Performance

Environment performance refers to the activities set up to cut down on the climatic effect. As environmental awareness is increasing amongst customers, De Giovanni (2012) indicates that companies are paying special attention and are launching green initiatives in their operations, which sequentially improve the performance of the firm. One can estimate the ecological effect by the waste produced, energy usage, water and air quality. Being ecologically sustainable will become more lucrative in the long term and this is the reason why companies often shun destructive and harmful products and practices (Savitz & Weber, 2006).

El Saadany, Jaber, and Bonney (2011) view environmental performance as estimating the amount of the pollutant released into the atmosphere from industries and harmful materials moved to and from other factories that end up affecting water and soil

quality as landfill. This study adopted the definition of environmental performance given by Zhu et al. (2012) as the capability of an organization to cut down on air emissions, solid and effluent wastes and the capability to reduce consumption of dangerous and toxic substance and reduced occurrence of an ecological accident.

1.1.4 Economic Performance

The economic value and profits that a company makes is the economical factor in the TBL. Economical aspect is the conventional measurement instrument that is mostly used when assessing the performance of an organization (De Giovanni, 2012). The conventional monetary measurement tools like return on investment, profit, sales, financial flows and taxes paid, determine the economical factor (Savitz & Weber, 2006). De Giovanni (2012) highlighted costs for logistics and delivery reliability as additional economic indicators related to sustainable logistics.

On the other hand, when a logistics company cuts its costs, it impacts less on the environment, because there are lower levels of emissions (Hampus & Henrik, 2014). This study used the definition of economic performance as suggested by Annika and Cheng (2018) where they argued that economic performance relates to the capability of a firm to cut down on costs related to materials purchased, energy consumed, fuel cost, waste treated, waste discharged, and fines due to environmental incidents and accidents.

1.1.5 Social Performance

Social performance is an organization's arrangement of values of responsibility socially, social alertness, observable outcomes, processes, programs and policies as they relate to the organization's societal relations. The social performance considered by this study is a concept to quantify results of the green logistics practices about

increasing company and product image, ensuring customer loyalty and satisfaction and protecting employee health and safety (Zailani, Eltayeb, & Hsu, 2012; Ashby, Leat, & Hudson-Smith, 2012).

The measure of the social impact of an organization can be indicated by the level of satisfaction of both the customer and employee (Markley & Davis, 2007). This can also be measured by human rights, labour practices, product responsibility and community impacts (Savitz & Weber, 2006). A sustainable organization will make all its decisions having in mind their workers and the community to contribute towards social development.

1.1.6 Firm Performance

Firm performance is described as a comprehensive construct that can be unidimensional or multidimensional (Selvam, Gayathr, Vasanth, Lingaraja, & Marxiaoli, 2016). It is argued to be a dependent variable influenced by multiple factors. Firm performance measurement is an integral part of ensuring firms continued success. Neely, Gregory, and Platts, (1995) defined firm performance as a metric used to measure the effectiveness and efficiency of organizational action. There is a need for such metrics to directly relate to the firm's objectives and mission, imitate the firm's external competitive environment, internal objectives and customer requirements. The balanced scorecard (BSC), one of the most prominent measures of firm performance was developed as a structure that included non-financial performance to the traditional economic metrics to give a clear and holistic view of firm performance (Kaplan & Norton, 2010).

This study took firm performance as the final dependent variable. It consequently used the balanced scorecard approach which has four perspectives; financial, internal

process, customer, learning and growth in measuring firm performance (Kaplan & Norton, 2010). The financial aspect centres on the firm's profitability and its capability of generating sales and returns on investment in comparison to the industry average (Claycomb, Dröge, & Germain, 1999). The indicators of financial perspective in this study are profit, revenue growth, return on assets. Customer perspective indicators included; delivery time, damages on transit and market share growth. Internal process perspective indicators are new service introduction, capacity utilization, and logistical quality controls. The learning and growth perspective indicators include innovations, staff turnover, employee productivity, employee education, and staff training (Kaplan & Norton, 2010; Antônio, Cunha, & Lisa, 2015).

1.1.7 Logistics Service Providers in Kenya

The modern logistics industry in Kenya draws its origin from the Kenya-Uganda railway. Kenya has a linear longitudinal logistics structure located along a single corridor. Much of the economic activity and many towns are situated along the Northern corridor (World Bank, 2005). Kenya's location as a gateway into the interior of Eastern Africa (Rwanda, Uganda, Southern Sudan and Burundi) through Mombasa port has formed a much vibrant logistics industry. Many privately owned logistics firms compete along this corridor and different transportation modes such as rail, air freight and road compete on the corridor. The logistics sector is a significant contributor to the economy accounting for 7.9 % of GDP (KNBS, 2018). The sector contributed 9.7% to the growth for the period 2013- 2017. Its growth accelerated to 8.8% in 2017. The output from road transport increased by 5.7 per cent and accounted for 62.9% of total output in the industry.

Logistics firms face a lot of challenges, top of which comprise of escalating fuel prices, ecological degradation from waste produced by their equipment and green movement lobby groups that advocate for compulsory participation in ecological initiatives. The industry is characterized by logistics organizations struggling against a wave of procedural and physical impediments to transport goods across the corridor (World Bank, 2005).

According to Kenya International Freight and Warehousing Association (KIFWA), in Kenya major international logistics companies only have agencies instead of full subsidiaries (KIFWA, 2018). The growth of investment and trade translates into an enormous potential for logistics firms in Kenya. A diverse number of business models exist in the industry, though some may overlap, and individual firms can operate under more than one model. Carriers, Courier / Express / Parcel (CEP) companies, Logistics Service Providers (LSP) and Postal Operators are significant players in the perspective of logistics and CEP. A small but fast-growing segment is represented by CEP and around a third of CEP sales can be attributed to B2C (Business to Customer) (PwC, 2016). The industry customers comprise of both B2C (Business to Customer) and B2B (Business to Business) segments. A majority of the market total transactions can be linked to B2B, with carriers and LSPs accounting for the largest portion of industry revenue. As earlier indicated, transportation practices chiefly add to the ecological problem by noise and air contamination. Transport suppliers and associations have taken diverse initiatives including green logistics practices which are aimed at diminishing the natural effect of logistics activities (Bandara & Ratnajeew, 2015).

1.2 Research Problem

Eight per cent of the world's current total carbon emissions emanate from logistics and the environment is affected to a great extent (McKinnon, Cullinane, Browne, & Whiteing, 2010). The World Trade Economic Forum (2009) affirmed that 5.5% of the total greenhouse emissions globally originate from logistics. This is inclusive of all types of greenhouse gases, not just carbon dioxide. Out of these, two-thirds can be linked to road-transports. Emissions from logistics industry are rising at a greater rate than any other industry and the trend is expected to continue such that by 2030 these levels will be 80 per cent greater than current levels unless there is a change (Ribeiro et al., 2007).

In consideration of the above rates of emission emanating from the logistics industry, it is vital to initiate countering resolutions. One commonly talked about method, is the initiation of green logistics as a deed to reduce the environmental effect of transportation practices. Taking measures regarding environmental concerns in a socially responsible way is becoming an important part of the modern organization agenda (Murphy & Poist, 2003). The characteristics of these firms need to be understood. Firms aim to reduce cost and they need to strike a balance between economic, social and ecological factors for sustainability.

The National Climate Change Action Plan (NCCAP) investigation submits that GHG emissions in Kenya will upsurge in all sectors until 2030 with transport emissions increasing the most by a factor of three. The discovery of coal and oil deposits, which are commercially viable, will most probably contribute to increased emissions in Kenya. Traffic congestion in major towns and cities, specifically during peak hours, increases local air pollution and contributes to GHG emissions through the use of

more fossil fuel, which have severe health implications (NCCFP, 2016). Organizations in developing countries are still learning how to integrate green practices in their day-to-day operations compared to those in developed countries (Rao, 2007). Many firms in Kenya have not fully understood the impact of environmental management specifically in the logistics sector.

Encouraging businesses to adopt green logistics practices begins by looking at the enhancements these practices are likely to bring to firm performance. Several empirical studies have been done to explore this link (Cordeiro & Sarkis, 1997; Donghyun, Sang, & Sung, 2012; Lai & Wong, 2012; Isaksson, 2012; Kung, Huang, & Cheng, 2013; Laosirihongthong, Adebanjo, & Tan, 2013; Björklund & Forslund, 2014; Weng & Chen, 2015; Mogeni & Kiarie, 2016). Several knowledge gaps emerge on critically reviewing these studies.

One, these studies have established conflicting findings. Several empirical studies have indicated a positive link between green logistics practices and firm performance (Kung, Huang, & Cheng, 2013; Björklund & Forslund, 2014; Weng & Chen, 2015). Others have indicated no link between particular green logistics practices and firm performance (Sang, Sung, & Donghyun, 2012; Isaksson, 2012). Others too have established the existence of a negative link between specific green logistics practices and firm performance (Cordeiro & Sarkis, 1997). Still, others found a blend of positive and other relationships (Laosirihongthong, Adebanjo, & Tan, 2013). The above literature review shows that there are conflicting results regarding the type of relationship that exists between the components of green logistics practices and firm performance. Therefore, firms are unable to tell if adopting green logistics practices yields improved firm performance. This study aimed to gather evidence in the

Kenyan context to establish if there is a relationship between green logistics practices and firm performance.

Two, researchers' attention has started to shift and they are now being attracted to environmental practices in service sectors (Kassinis & Soteriou, 2003). However, majority of empirical studies related to sustainable environmental improvements have largely been directed to manufacturing organizations (Min & Galle, 2001; Zailani, Eltayeb, Hsu, & Tan, 2012; Odock, 2016). While a lot of research is addressing the environmental sustainability issue in the whole of the supply chain, a review of literature by Lin and Ho (2016) points out that in the last decade, few studies have centred on ecological concerns in the logistics industry. A lot of contribution on this subject can be found in existing literature, occasionally under the tag "Green Supply Chain Management" (GSCM) (Zhu et al., 2012). A lot remains to be understood about ecological management issues in logistics which contribute to about a quarter of emissions of Green House Gases (GHG) which is energy-related globally (Venus, 2011). Furthermore, studies approaching the environmental sustainability issue from third-party logistics (3PLs) perspective are few (Lin & Ho, 2016).

Three, a lot of research on green logistics practices have been done in more developed countries with very few being done in Kenya. A closely related study was done by Odock (2016) who examined the relationship between GSCM practices implementation and organization performance of 67 ISO certified organizations in East Africa. Mogeni and Kiarie (2016) did a study of 10 multinational organizations in Kenya on the influence of green logistics practices on supply chain performance. Kinoti (2012) surveyed 120 ISO certified firms in Kenya to determine the relationships between green marketing practices, organizational characteristics, and

performance. A developing country like Kenya faces great challenges in ensuring a balance between environmental sustainability and development. Many Kenyan firms are yet to completely understand the impact of environmental emphasis, especially in the export market. Rao (2002) observed that, in comparison to developed countries, developing countries organizations are in the learning stage on how to integrate green practices in their daily operations. A study in a developing country looking at green logistics practices in place and their relationship to firm performance was of interest.

Four, most of the studies on green logistics (Zailani et al., 2012; Isaksson & Huge-Brodin, 2012; Hampus & Henrik, 2014; Sari & Yanginlar, 2015) have not exhaustively looked at the three dimensions of firm performance. The concept of TBL has not been fully investigated by these past studies despite it being an important concept in sustainability. For firms to be encouraged to adopt green logistics practices, the starting point should be the benefits they derive from these practices. Huang and Yang (2014) considered the environmental performance only while Weng and Chen (2015) looked at the effect ecological performance has on firm performance. Sari and Yanginlar (2015) carried out research and considered the economic and ecological performance effect on organization performance. Hence, a study with a wider focus on performance was called for. Consequently, this study aimed to explore the influence of implementing the different green logistics practices on different dimensions of the TBL and the eventual effect on firm performance.

Firm's characteristics as control variables have been left out in most of the studies. Jacobs, Singhal, and Subramanian (2010) argue that due to complex nature of the various connections between GSCM practices and organization performance, a

broader path analysis or structural equation model between the practices and moderators may offer further insights. Odock (2016) looked at firm size, firm age and spatial scope. A study looking at other firm characteristics variable like firm ownership, presence of environmental management systems and conceptualizes firm size differently was called for. Consequently, this is an area, which required investigation.

Regression analysis as a technique of data analysis has been employed by several studies with the dependent variable defined on the ordinal scale. The weaknesses of regression analysis are that; it only allows a single dependent variable and does not account for measurement errors. On the other hand, covariance-based structural equation modelling (CB-SEM) allows concurrent analysis of all model variables instead of doing it separately. Additionally, measurement error is not aggregated in a residual error term (Chin, 1998). A good number of green logistics studies have used a sample that can be considered convenient and therefore cannot be generalized (Isaksson, 2012; Hampus & Henrik, 2014; Sari & Yanginlar, 2015; Mogeni & Kiarie, 2016). The weakness of convenience sampling is that; it is subject to influences and bias beyond the control of the researchers (Saunders, Lewis, & Thornhill, 2009). A study that uses CB-SEM or other statistical tools to overcome the weakness of regression analysis and uses random sampling was valuable.

Lai and Wong (2012) studied the relationship between green logistics management and firm performance in 48 Chinese manufacturing exporters. Data was analysed using regression analysis. The study looks at green logistics management practices in China which is outside Africa. Firm characteristics were not included as a moderating variable. The current study looks at green logistics practices in Africa and particularly

Kenya and includes firm characteristics as a moderating variable. CB-SEM was used for analysis and a larger sample was used. Kinoti (2012) sought to establish the relationships between green marketing practices, firm characteristics and performance of 120 ISO 9000 and 14000 series certified organizations in Kenya. Data were analysed using multiple regression analysis. The study did not distinguish between the various types of performance. The current study distinguished between the various types of classification into environmental, social, economic, and firm performance. The current study concentrated on logistics which is the largest contributor to pollution.

Huang and Yang (2013) investigated the relationships between institutional pressures, reverse logistics innovation and performance of electronic and information firms in Taiwan. Data were analysed using hierarchical regression analysis. This study looked at reverse logistics practice only. Firm performance was measured through economic and environmental performance. The current study looked at other elements other than reverse logistics and performs a wider perspective by including social performance. Odock (2016) studied the relationship between GSCM practices implementation and performance of 67 ISO certified manufacturing organizations in East Africa. He analysed data using PLS-SEM. The study focused on a small sample of ISO-certified organizations. Secondly, firm performance was limited to operational and environmental dimensions. Green logistics practices were examined in the current study. The performance was enhanced by looking at social, environmental, economic and firm performance and the study was done in Kenya. This study, therefore, made an effort to fill the gaps raised by addressing the question; what is the effect of green logistics practices on performance of logistics firms in Kenya?

1.3 Research Objectives

The general objective of this study was to determine the relationship between green logistics practices and firm performance. The specific objectives were:

i.   Establish the effect of green logistics practices on performance of logistics firms in Kenya.

ii. Determine the influence of firm characteristics on the relationship between green logistics practices and performance of logistics firms in Kenya.

iii. Examine the influence of environmental performance on the relationship between green logistics practices and performance of logistics firms in Kenya.

iv. Establish the influence of economic performance on the relationship between green logistics practices and performance of logistics firms in Kenya.

v.   Examine the influence of social performance on the relationship between green logistics practices and performance of logistics firms in Kenya.

vi. Determine the joint effect of green logistics practices, firm characteristics, environmental performance, economic performance and social performance on firm performance of logistics firms in Kenya.

1.4 Value of the Study

The study can be valuable to the logistics service providers in that the findings can enlighten them on the influence of green logistics on firm performance given the ownership of the firm, its size and the possession of EMS certification. The findings are also particularly appropriate to company's management that takes decisions on logistical formations that spur their firms forward as they have a point of reference on the direction that implementation of green logistics practices takes the firm. This can help in dispersing any doubts the firm's management may have when making green logistics decisions. It can further inform investors in the logistics industry on the

importance of incorporating green logistics practices in their firms and its overall effect on social, environmental and economic performance. The study can demonstrate the motive of implementing green logistics.

This study has enhanced the theoretical development of the RBV, NRBV and the stakeholders' theories. It provides theoretical insights into green logistics practices researchers. The model has empirically contributed to the prevailing body of knowledge on the connection between green logistics practices and firm performance through the economic, environmental and social performance. From the perspective of academics, this study contributed by giving more information within the concept of green logistics. It acted as a valuable point of reference to scholars in the discipline and act as a guide for further research. The research provided to researchers alternative practical methodological and conceptual direction that can be adopted in cross-examining other variable connections.

Besides, the research findings are important to Government and policymakers in the identification of gaps in the existing policies, hence set new guidelines that seek to protect the environment while promoting industrial growth. In Kenya's vision 2030 a blueprint for development, environmental management has been identified as one of the social sectors that will ensure the building of a cohesive and just society that enjoys unbiased social maturity in a secure and clean environment. The study acts as a preface by providing a picture of the expected results if certain principles are taken up to guide the industry.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter starts by explaining the theories on which the study is anchored. Next, it explains the connection among the main variables of the research and concludes with the conceptual framework and hypotheses.

2.2 Theoretical Foundation of the Study

This research is grounded on the following theories: resource-based view, natural resource-based view, stakeholders' theory, and the triple bottom line theory.

2.2.1 Resource-Based View

Wernerfelt (1984) developed the RBV which proposes that an organization's performance and competitive strategy depend significantly on its rare, non-substitutable, inimitable, and valuable resources. A rare resource is one, which is not accessible to many firms. The degree to which resources are lined up with the external environment to minimize threats and to exploit opportunities is referred to as value. The non-substitutability quality is usually the degree to which competitors are unable to create similar resources. Hoskisson, Hitt, Wan, and Yiu (1999) defined inimitable as the degree to which opponents cannot replicate or acquire the resources, or can only do so at a substantial cost.

The green logistics practice is a resource, which should be crafted as valuable, rare and inimitable, and therefore meeting the definition in the RBV. Having the knowledge and capabilities for green logistics is a resource falling well within this theory (Lai, Cheng, & Tang, 2010). It is a strategic resource since it can lead to improved organizational performance and competitiveness (Klassen & Vachon, 2008). The critics of RBV contend that valuable, rare, inimitable, and non-

substitutable (VRIN) is neither sufficient nor necessary for firm's continual competitive edge; the value of a resource is too undefined to provide for a useful theory; and lastly, the definition of a resource is impracticable. Therefore, more research was important for the reaffirmation of this theory.

2.2.2 Natural Resource-Based View

The natural resource-based view (NRBV) is an extension of the RBV and is used extensively in the explanation of the reason why firms take up green initiatives. It is, therefore, the main theory for this study. The NRBV argues that competitive advantage and strategy can be fashioned from capabilities facilitating economic activities, which are environmentally sustainable (Hart, 1995). Hart posits that for a resource to be rare, valuable, non-substitutable and inimitable, it must be firm-specific, socially complex, and causally ambiguous. The inimitability of an organization's strategic resource gives the firm protective machinery from the acquisition of similar resources by competitors. The reason for this is that such resources are causally ambiguous as they are established over a duration of time through continuous experience and learning. The social complexity of the resource is attained through highly synchronized activities involving many people and teams that means, the overall phenomenon can only be adequately understood by a few individuals (Barney, 1991). Green logistics practices are resources that are firm-specific, socially complex, and causally ambiguous and therefore meeting the definition in the NRBV.

On the contrary, Hart (1995), being familiar with the challenges imposed from both social and natural environments, alluded to a possibility of competitive advantage and strategy being embedded in an organization's ability to facilitate ecologically

responsible activities. Hart continued to argue that a solely "internally based" competitive approach may prove insufficient because of the issue of the external relation. Nonetheless, critics of this theory have disputed the firm-specificity requisite. The relational view shows that beyond the firm's boundaries, organizational competencies can be created by putting together resources already in existence in various participants of the supply chain (Dyer & Singh, 1998). These resources are socially complex and causally ambiguous and therefore competitors are unable to imitate them (Shi et al., 2012). A combination of the RBV with the NRBV argues that ecological management in the supply chain can build a competitive edge. The criticisms of this theory are the same as that of the resource-based view since it is its advancement.

2.2.3 Stakeholders' Theory

According to Friedman and Miles (2006), the phrase stakeholder was invented by the Stanford Research Institute in 1963 and was defined as those groups the firm would die out without their support. Freeman was the first to bring into the strategic discipline the concept of stakeholder in the year 1984, which not only distinguished shareholders from stakeholders in organizations but also demonstrated the effects of different stakeholders on firms' processes of decision-making (Donaldson & Preston, 1995; Mitchell, Agle, & Wood, 1997).

Stakeholders' theory recommends that organizations create externalities that touch on numerous parties who are both external and internal to the organization. It recognizes the fact that other than shareholders, there are people or groups who the firm is committed to and who are prone to be specifically affected by the moves made by it or have an unequivocal legally binding relationship with it (Sarkis et al., 2011).

Externalities regularly make stakeholders enhance pressure on firms to decrease harmful effects and build helpful ones. As the firm meets societal desires, they ought to expect an increment in societal support which is required to translate into expanded performance. From a strategic point, firms that embrace green initiatives like green logistics find these activities to be a competitive advantage source (Alkhafaji, 1992).

Stakeholders especially the external ones can control the opinion of the public. Managerial and employee stakeholder pressure can result in a worthy loop of pre-emptive ecological strategies like green logistics practices (Sarkis et al., 2011). Delmas (2001) indicates that external stakeholder involvement has a strong and positive influence on the competitive edge. A critique of the stakeholder's theory is that the theory suggests that an organization has very few intrinsic interests that are determined entirely by its relations to internal and external stakeholders. A shift in those relations, and the interests of the firm change accordingly. These interests are not instinctive at all; rather, they are a mere reflection of the meaningful ties that the organization has (Key,1999).

2.2.4 Triple Bottom Line Theory

John Elkington coined the triple bottom line (TBL) theory in 1994 arguing that a firm that wants to be sustainable in their profit pursuit ought to contribute to sustainable progress by guaranteeing environmental, social, and economic benefits. The above-mentioned drivers: environmental, economic, and social (otherwise known as planet, profit, and people) are the foundations of the concept of TBL. To get to sustainable development, firms must strike a balance between the three TBL components. Markley and Davis (2007) posit that TBL promotion indicates to all stakeholders that

the objective of the business is not only economic but also that social and environmental aspects are taken into consideration.

TBL is particularly focused on forward logistics, that is, from manufacturer to customer, and is consequently linked to the idea of green logistics (Bloemhof, 2005). Forming environmental and social initiatives could permit managers to implement a robust strategic value (Porter & Kramer, 2006). Additionally, Wu and Dunn (1995) maintain that devising such initiatives make it possible for managers to meet economic objectives, in addition to environmental and social objectives. According to the TBL theory, a sustainable firm is one that strikes a balance between the three factors. A critique of this theory is that an ecologically friendly decision may not be the most viable economic option in the short-term (Sridhar & Jones, 2013). In line with TBL, green logistics has been presented in the logistics industry as an ecologically sustainable enterprise for the future.

2.3 Green Logistics Practices and Firm Performance

The link between green logistics practices and firm performance is anchored on RBV, NRBV, stakeholders' theory and the TBL theory. All organizations are confronted by an extreme situation in an attempt to remain competitive in the current global markets. Appreciating the need to slot in the TBL and sustainability in the context of their strategic plan, organizations concentrate on measuring the environmental, social and economic effects of their actions and stress on the connection between performance and sustainability (Subramanian & Gunasekaran, 2015). In line with the NRBV, sustainability efforts in organizations are determined by renewable power, innovations in energy efficiency, green operations and overall resource productivity (Lubin & Esty, 2010).

New and more comprehensive measures must be taken to cut emissions. These measures include usage of alternative means of transport and energy sources and more efficient usage of current forms of energy. Due to government legislation and management, corporate environmentalism and social awareness, the shift towards green initiatives in the supply chain is now enforced across the globe by supply chain and logistics organizations (Natarajan & Wyrick, 2011). In the recent past, interest has shifted to the effects of logistics on climate change, owing to the improved understanding of the danger being posed by global warming (McKinnon, Cullinane, Browne, & Whiteing, 2010). It is not all firms that are eager to do their best for green logistics. This is because the link between green logistics practices and firm performance is unclear. Some studies indicate a positive relationship (Lai & Wong, 2012; Abareshi & Molla, 2013), yet others reveal a negative link between some green logistics practices and firm performance (Testa & Irlado, 2010; Laosirihongthong et al., 2013). This study made the proposition that green logistics practices have a significant positive effect on firm performance.

2.4 Green Logistics Practices, Firm Characteristics and Firm Performance

As earlier indicated, much of the contribution to this subject of green logistics can be found on existing literature occasionally tagged GSCM (Zhu et al., 2012). Recent literature has studied the effect of firm characteristics on green initiatives implementation was undertaken by logistics service providers (LSPs) which include firm age, firm size and possession of an EMS. As earlier discussed, the effect of firm size on both green logistics practices and firm performance is positive. Greater size leads to economies of scale enhancing the feasibility of green innovation implementation (Moch & Morse, 1997).

Several researchers have detailed firm size as a factor that is significant in persuading the enactment of green logistics practices (Hassan, Balan, & Prakash, 2016). Odock (2016) examined the moderating effect of firm size measured by the number of employees on the relationship between GSCM practices implementation and performance and noted no moderating effect on this relationship. A study, which conceptualizes firm size differently, is valuable, this study measured firm size in terms of assets. Song, Feng, and Jiang (2017) looked at the moderating effect of firm size on the relationship between green external integration and firm performance on 176 Chinese manufacturing firms and indicated that firm size has a moderating effect on this relationship. However, Lai, Wong, and Zhao (2012) point out that firm size does not affect green practices implementation. This study hypothesized that firm size moderates the relationship between green logistics practices and firm's performance.

Cordano, Marshall, and Silverman (2010) on their research in the USA winery industry on the green practices employed, established that organizations with more enhanced environmental management program (EMP) attained greater heights in initiating recycling activities and energy conservation and as a result achieve better environmental performance. In addition, Gonzalez, Sarkis, and Diaz (2008) examined the presence of initiation differences in environmental practices within organizations that possessed ISO 14001 certification or had some form of Environmental Management Systems (EMS) and those without in Spain. The researchers established a relationship that was significant between the possession of EMS and the implementation of green initiatives. Consequently, this study hypothesized that possession of EMS moderates the relationship between green logistics practices and firm's performance.

Other green supply chain management studies have examined the moderating effect of firm characteristics on performance. Majumdar (1997) posited that larger organizations tend to perform better than smaller ones. Odock (2016) indicated that the moderating variables of firm size, firm age and spatial scope of the market have no moderating effect on the positive relationship between GSCM practices and organizational performance. Firm size, firm ownership and possession of EMS are some of the moderating variables, which have been looked at by these studies. Given the preceding discussion, these firm characteristics were used in this study to ascertain their moderating effect on the link between green logistics practices implementation and firm performance. This results in the following proposition; Firm's characteristics moderate the relationship between green logistics practices and firm's performance.

2.5 Green Logistics Practices, Environmental Performance, Economic Performance, Social Performance and Firm Performance

The section discusses green logistics practices and firm performance. It is anchored on the argument that implementation of green logistics practices leads to improved firm performance through environmental, economic, and social performance.

2.5.1 Green Logistics Practices, Environmental Performance and Firm Performance

Extension of the conventional supply chain into environmental matters facilitates the contemplation of the short- and long-term environmental effects of processes and products (Beamon, 1999). Green logistics practices centre on the eradication of wastes related to environmental sustainability. If this waste is reduced it leads to cost reduction and subsequently to environmental performance improvement. Evidence points out that the market values environmental awards and announcements of

winning such awards are always rewarded with a rise in valuations reflected by higher stock prices (Klassen & Vachon, 2008).

The relationship between green logistics practices and environmental performance can also be explained by the institutional theory in which Zhu and Sarkis (2008) argue that organizations cling to certain strategies to gain legitimacy within society. Consumers are gradually more concerned with environmental and ethical issues which shape their buying decisions (Trudel & Cotte, 2009). Organizations, cannot overcome the sustainability tests facing the globe alone and thus a need for stakeholders to also be involved. Once the organization has been accepted by society because of implementing green practices in its logistics, then the environmental performance will improve.

By embracing green logistics practices, logistics firms can reduce their negative effects on the environment through developing environmentally friendly packaging, route optimization, ensuring fuel efficiency and reverse logistics. A definite issue of growing concern globally is waste, firms need to indicate and describe the method of measurement used to report and track their waste quantities. Indicators can include waste type, like is it hazardous or non-hazardous, or its destination, like incineration, recycling, or landfill. Possible ecological impact reduction measures would include hazardous waste reduction; noise reduction; GHG emissions reduction; reduction of solid waste disposal and reduction of wastewater discharge (Verfaillie & Bidwell, 2000). The link between green logistics practices and environmental performance has been recognized by several studies (Zhu & Sarkis, 2004; Testa & Irlado, 2010; Kung, Huang, & Cheng, 2012). On the other hand, a study by Pullman and Maloni (2010) established mixed outcomes with some results being positive and others showing no

support for a link between the two variables. Therefore, this study hypothesizes that the execution of green logistics practices leads to improved ecological performance.

In the environmental performance arena, the specific aspects of organization activities that bring about improved firm performance have been highlighted by Porter and Kramer (1991) who advocate for the idea that; the application of the ecological program leads to enhanced revenue streams and superior efficiencies. Greater product margins and gains in market share are often quoted as the effects of going green for increased revenues. Equally, reduced waste, penalties avoidance, material consumption reduction and recruiting better performers are cited as means for efficiency increase (Klassen & Vachon, 2013, Mollenkopf et al., 2010). Conversely, there are related costs too, for instance, adoption costs of environmental initiatives (Darnall, 2006). Although ecological performance practices may have costs and benefits related to them, this study investigated the net effects on firm performance.

Prior studies investigating the linkage between environmental performance and firm performance are limited. The few that investigated this relationship (Chien & Shi, 2007; Mollenkopf et al., 2010; Green et al., 2012; Odock, 2016) have not arrived at a clear conclusion. This leads to the suggestion that an organization's environmental performance has a significant positive effect on its performance. As earlier discussed, several studies have indicated that environmental performance is influenced by implementing green logistics practices (Chien & Shi, 2007; Testa & Irlado, 2010; Kung et al., 2012). Prior research also indicates that there is a relationship between environmental performance and firm performance (Mollenkopf et al., 2010; Odock, 2016). This led to the following proposition: The link between green logistics practices and firm's performance is mediated by environmental performance.

2.5.2 Green Logistics Practices, Economic Performance and Firm Performance

Green logistics practices centre on the eradication of wastes related to ecological sustainability. If this waste is reduced it will result in a reduction in cost and this will lead to economic performance improvement. Rao and Holt (2007) indicated that green supply chain management practices led to better economic performance and competitiveness. The economic value and profits which a company makes is the economical factor in the TBL. The economical aspect is the conventional measurement instrument because it is the aspect of TBL that is mostly used when assessing firm performance. Though the economic growth of a firm is vital, John Elkington's TBL represents that if a firm focuses on environmental and social aspects then greater performance economically will originate from it. This is because it is can provide rewards for the organization. Customers are more than willing to buy a product from a socially and ecologically conscious organization, which can give the company a competitive advantage (De Giovanni, 2012).

Savitz and Weber (2006) indicate that the conventional monetary assessment tools such as profit, return on investment (ROI), sales, financial flows and taxes paid, determine the economical factor. Labour exploitation in a country where costs are low and also of the low standard would be a case of an economically driven but unsustainable organization. In road transportation, firms can cut costs and enhance economic performance by fuel or route optimization and reverse logistics. On the other hand, when a logistics company cuts its costs, it impacts less on the environment, as there is a lower emissions level. The proposition for this research was that economic performance has a positive impact on firm performance. It has also been determined that economic performance can also be enhanced by implementing green logistics practices (Zhu & Sarkis, 2004; Rao & Holt, 2007; Green et al., 2012).

It is also expected that economic performance is positively related to firm performance (Sibel & Bulent, 2019). This led to the following proposition: The relationship between green logistics practices and firm's performance is mediated by economic performance.

2.5.3 Green Logistics Practices, Social Performance and Firm Performance

Social performance is an organization's arrangement of values of responsibility socially, social alertness, observable outcomes, processes, and policies and how they are related to the organization's societal relationships (Mitchell, Agle, & Wood, 1997). It can be comprehended as the measurement of social issues that generate concerns in society (Searcy, 2013). The relationship between green logistics practices and social performance is anchored on the stakeholders' theory which recommends organizations to create externalities affecting numerous parties who are both external and internal to the organization. It recognizes the fact that other than shareholders, there are people or groups who the firm is committed to and who are prone to be specifically affected by the moves made by it or have an unequivocal legally binding relationship with it (Sarkis et al., 2011).

Firm performance focus on the current international environmental demands has changed. Formerly, the concentration was mainly on wealth creation through economic performance which was superior and measured in terms of liabilities, assets success and market strength in general. Today the focus has shifted to social and environmental performance while attaining high firm performance to reach optimal heights of sustainability (Carter & Rogers, 2008). For organizations to attain a long-term competitive edge there must be an intersection of society, environmental and economic superiority according to organizational sustainability (Thoo, Abdul, Rasli,

& Zhang, 2014). Therefore, firms ought to shift focus to long-run profitability that could lower the societal and environmental risks simultaneously (Porter & Kramer, 2006). Hallegatte et al. (2011) maintained that the relationship between green growth and social performance is clear because generally, changes in monetary growth are linked to social performance even where there are policies to reduce inequality. Superior social performance is seen as a possible source of competitive edge, as it leads to more efficient processes and productivity improvements, new market opportunities and lower costs of compliance (Schaltegger &Wagner, 2006).

Research on the link between green initiatives and social performance are inconclusive, meaning that, it is unclear how green logistics practices affect the social dimension. A positive relationship between green practices and social performance has been found (Waddock & Graves, 1997; Lin, Yang, & Liou, 2009; Ruf, Muralidhar, Brown, Janney, & Paul 2001; Wagner, 2010). Other researchers found no significant relations between the two (Mahoney & Robers, 2007; Parast & Adams, 2012). Consequently, green logistics practice is in a primary point to influence sustainability in social performance. This study hypothesizes that green logistics practices lead to enhanced social performance.

Social and environmental criteria are toping in customer's consideration of their buying decisions. Several investors are making decisions based on social screening services, and governments across the globe are executing stricter ecological and social policies. There are expectations that this will affect the behaviour and performance of organizations either directly or indirectly. Some literature has investigated the relationship between social performance and firm performance (Carter, Kale, & Grimm, 2000; Simpson & Kohers, 2002; Wang, Choi, & Li, 2008).

Particular practices like upgrading of employee living and working conditions, fair compensation, employee care and customer satisfaction are among the regularly evaluated practices in previous research (Wang & Bansal, 2012; Shafiq, Klassen, Johnson, & Awaysheh, 2014). By engaging in these practices, organizations can improve their reputation, which results in improved firm performance (Lee et al. 2013). Besides, a social management system which focuses on employees, educating and encouraging workers could also enhance firm performance through superior productivity (Matthew, Ogbonna, & Harris, 2012).

Contradicting results are given by findings from previous research on the relationship between social performance and firm performance. For instance, Li (2006) examined 521 companies listed in Shanghai and found out that increased social performance activities were related to a decrease in organization value in the short term but not in the long term. Shi and Tang (2012) studied the link between social performance and firm performance of agricultural firms in China and found a significant positive relationship between the two. There is a gap in consensus on the relationship between social performance and firm performance. Further, most studies have been done outside Kenya. Consequently, it can be hypothesized that social performance has a positive influence on firm performance. Again, it has been established that social performance can be enhanced by implementing green logistics practices (Lin, Yang, & Liou, 2009; Wagner, 2010). Besides, it has also been established that social performance is positively linked to firm performance (Hallegatte, et al. 2011; Shi & Tang, 2012). This led to the following proposition: The relationship between green logistics practices and firm's performance is mediated by social performance.

2.6 A Summary of Studies on Green Logistics Practices and Performance

Empirical evidence indicates that the bulk of research has concentrated on greening the whole supply chain and its relationship to firm performance. However little has been done to specifically look at greening the logistics part of the supply chain which is critical because of its emission levels which are way above any other part of the supply chain. Very few studies have been done to establish the link between green logistics practice and performance of an organization. Therefore, today's organizations have not gotten a clear picture of the benefits which accrue due to the greening effort in their logistics activities and how this affects their environmental, economic, and social performance. This could be due to the limitations of these studies as established in the review. Another common weakness of these studies is the fact that almost all of them are skewed to the developed world. A summary of these studies has been given in Table 2.1

Table 2.1   Summary of Other Related Studies

Scholar(s)	Focus of the Study	Methodology	Major Findings	Knowledge Gap	How gaps were addressed
Lai & Wong (2012)	The study looked at the relationship between green logistics management in Chinese manufacturing exporters and their performance	All the 48 manufacturing exporters surveyed. Data analysed using regression analysis	A positive link observed between green logistics management and environmental performance, regulatory pressure enhances this relationship.	The study looks at green logistics management practices in China, which is outside Africa. Firm characteristics not included as a moderating variable	This study looked at green logistics practices in Africa and particularly Kenya. CB-SEM to be used A larger sample is used
Donghyun, Sang & Sung (2012)	The study investigated the link between GSCM practices and organizational performance	Data collected using from 223 Korean SMEs in the electronics industry. SEM was used as a method of analysis.	No statistical significance was found between GSCM practices implementation and performance of a business.	The research is outside Africa and on GSCM practices. It does not test the effect of a moderating variable. The study accords equal importance to all elements of the supply chain yet others produce more pollution	The current study specifically focused on green logistics practices Firm characteristics were included as a moderating variable.
Kinoti (2012)	To establish the relationships between green marketing practices, firm characteristics and performance	A survey of 120 ISO 9000 and 14000 series certified organizations in Kenya. Data analysed using multiple regression analysis.	Green marketing (GM) practices Influence performance. GM practices do not improve corporate image. Corporate image is not a mediator in this relationship	The study does not distinguish between the various types of performance. The study uses Multiple Regression Analysis for variables defined on an ordinal scale	The current study distinguished between the various types of classification into environmental, social, economic, and firm performance. The current study concentrated on logistics which is the largest contributor to pollution.

Scholar(s)	Focus of the Study	Methodology	Major Findings	Knowledge Gap	How gaps were addressed
Huang & Yang (2013)	Investigation of the relationships between Institutional pressures, Reverse logistics innovation and performance	A questionnaire survey sampled 1200 electronic and information firms in Taiwan. Data were analysed using hierarchical regression analysis.	Reverse logistics innovation is positively linked to environmental performance. Reverse logistics innovation and environmental performance relationship are positively moderated by institutional pressures.	This study looked at reverse logistics practice only. Firm performance was measured through economic and environmental performance.	The study looked at other elements other than reverse logistics and performance in a wider perspective
Abareshi & Molla (2013)	Effect of green logistics on environmental performance.	Data collected from 279 Logistics and Transport operators in Australia. The analysis was done using SEM.	Results show that green logistics knowledge enhancement leads to improved environmental performance.	The Study concentrates only on the environmental performance of the firm. Does not look at the moderating effect of firm characteristics	Firm characteristics were included in the current study as moderating variables Performance was enhanced by looking at social, economic, environmental, and firm performance.
Björklund & Forslund (2014)	Sustainable Logistics in Retail Chains (Shades of Green)	Descriptive data were obtained from 4 retail chains in Sweden. This was a multiple case study.	The findings were that a green image seemed to be aligned with the actions of green logistics.	The study is on the Swedish market. Descriptive data used is not sufficient to illustrate the relationship between variables. Done within the retail chain	A rigorous analysis technique CB-SEM was used in data analysis. Study was done in Kenya
Weng & Chen (2015)	A Stakeholder Perspective on green Innovation effects on Corporate and Environmental	A study on 202 manufacturing and service companies in Taiwan. PLS-SEM used to analyze	Results indicate that green innovation practices have a significant positive	The study focused on green innovation pressures and practices and done outside Africa.	Firm characteristics were included in the current study. Study was done in Africa

Scholar(s)	Focus of the Study	Methodology	Major Findings	Knowledge Gap	How gaps were addressed
	Performance	data.	impact on environmental performance. Government and competitors' pressure, employee conduct, all have a positive effect on green innovation practices	It did not include firm characteristics as a moderating factor.	(Kenya) Three levels of performance were considered namely; social, environmental, economic, and firm performance.
Odock (2016)	The relationship between GSCM practices implementation and performance of ISO 14001 certified Manufacturing organizations in East Africa	Examined 67 firms using a cross-sectional research design. Data were analysed using PLS-SEM	There is a significant positive link between GSCM practices and firm performance. Operational and environmental performance constructs amplified the variance explained in organizational performance	The study concentrated on a small sample of ISO-certified manufacturing organizations in East Africa. Secondly, firm performance was limited to operational and environmental dimensions.	Green logistics Practices were examined. Performance was enhanced by looking at social, environmental, economic, and firm performance Study was done in Africa (Kenya)

2.7 Conceptual Framework

From the foregoing discussions, the study's conceptual framework is shown in Figure 2.1.

Figure 2. 1   Conceptual Framework
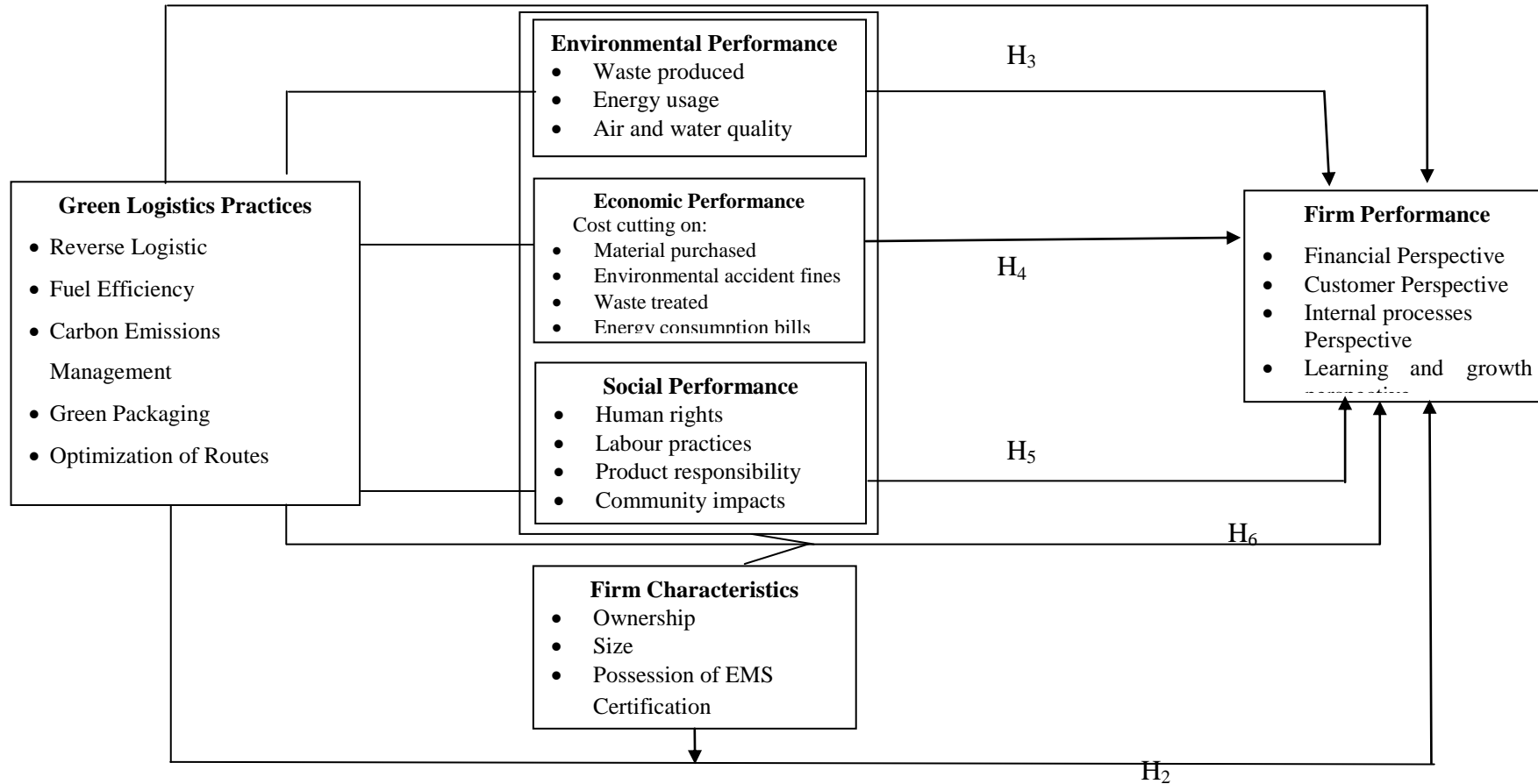
Source: Author (2020)

2.8 Conceptual Hypotheses

From the theoretical and empirical review, the study proposed the following hypotheses to explain the relationships that are outlined in the conceptual framework.

H₁: Green logistics practices by an organization have a significant effect on the firm's performance.

H₂: Firm's characteristics moderate the relationship between green logistics practices implementation and firm's performance

H₃: The relationship between green logistics practices and firm's performance is mediated by environmental performance.

H₄: The relationship between green logistics practices and firm's performance is mediated by economic performance.

H₅: The relationship between green logistics practices and firm's performance is mediated by social performance.

H₆: The relationship between green logistics practices, firm characteristics, environmental performance, economic performance and social performance with firm performance is significant.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research methodology adopted by this study is discussed in this chapter. It highlights the research philosophy, the research design rationale, and the study population. Further, a framework of the technique of collecting data and operationalization of research variables are highlighted, and how the researcher ensured the validity and reliability of the research instrument. Finally, a summary of how each study objective was analysed and interpreted is discussed.

3.2 Research Philosophy

Epistemological contemplations are focused on what is seen as acceptable knowledge in an area of interest and whether the same principles used in natural sciences can also be used in social studies. Three views constitute scientific knowledge and its suitability: positivism, interpretivism and realism. Positivism is the epistemological position which holds that natural sciences techniques can also be used to study social reality. A theory is considered truly scientific if it can pass the observation test (Bryman & Bell, 2011). Interpretivist argues that natural sciences are primarily different from social sciences and social actions subjective meaning needs to be comprehended. Scholars need to comprehend the different social roles humans have, in that social scientists should learn human behaviour and meaning, and actions interpretation from their point of view (Bryman & Bell, 2011). Realism view posits that reality and human perceptions are independent and what our minds indicates to us as authenticity is the truth and objects are independent of sense (Saunders et al., 2009).

In positivism, the researcher's role is limited to objective data collection and interpretation. The study results are typically quantifiable and observable. It has been

observed that positivism philosophy is in line with the empiricist view that human experience is the origin of knowledge. It has an atomistic, ontological view of the world as encompassing discrete, observable events and elements that interrelate in a determined, regular, and observable manner (Collins, 2010). Additionally, the researcher is independent of the study and human interests have no provision. Positivist studies as a rule of the thumb generally adopt a deductive approach and relate to the viewpoint that the researcher needs to concentrate on facts (Crowther & Lancaster, 2008).

Positivist research philosophy is what guided the current study because it involved objective testing of hypotheses formulated as predictions of theory and conceptual model as indicated in Figure 2.1. The study's main objective was to determine the link between green logistics practices and firm performance. It aimed to objectively collect data and the researcher was independent of the study. It was a deductive study aimed at generalizing its findings which were quantifiable and observable. Given the aforementioned characteristics of this study, positivist philosophy was the most suitable philosophy to be adopted by this research.

3.3 Research Design

This research used a cross-sectional survey research design. This was suitable for this research due to its efficiency in information collection from a selected target group of respondents within the population under study. Cross-sectional research collects data from the population or a chosen subset, at a specific point in time (Cooper & Schindler, 2013). The study aimed to collect data across different logistics firms in Kenya. Sproull (1995) recommends survey research design as the most appropriate for social scientists interested in collecting primary data on attitudes, ideas, behaviour

and intentions of a target population. Primary data was collected on green logistics practices, firm characteristics, environmental performance, economic performance, social performance and firm performance.

3.4 Population of Study

The population of interest consisted of all logistics firms in Kenya that are under Kenya International Freight and Warehousing Association (KIFWA) which is the representative of all Kenyan logistics firms (KIFWA, 2018). According to KIFWA 892, logistics companies were operating in Kenya by the end of 2018. These 892 companies, therefore, formed the population of this study. The list of these is shown in Appendix IX.

3.5 Sample Size and Sampling Technique

The simple random technique was used to select the firms included in the sample. The firms targeted in this study were a portion of the 892 companies who were members of KIFWA in 2018. The sample size is determined using the Slovin's formula.

$$C = \frac{N}{\{1+Ne^2\}}$$

Where, C, ė and N are the sample size, the error tolerance and total population respectively. Ariola (2006) suggests that in using Slovin's formula, the error of tolerance is between 0.05 and 0.01. This study used 0.05 as a tolerance error. Given a total population of 892 firms, the sample size was:

$$C = \frac{892}{\{1+892x0.05^2\}} = 276$$

To deal with non-response rate a 10% safeguard provision was made over and above the 276 units. In light of this, a sample size of 300 was targeted (Cooper & Schindler, 2013). The list of firms selected to form the sample is shown in Appendix VIII.

3.6 Data Collection

A structured questionnaire was used to collect primary data (Appendix V). The questionnaire was divided into six sections. Section A sought information on the organization's profile. Section B collected data on green logistics practices implemented by the organization. Sections C, D, E and F gathered data on the organization's environmental, economic, social, and firm performance respectively. In this study, one respondent from each of the sampled logistics firms completed the questionnaire. The unit of analysis was the logistics firm and the respondents were the logistics executive or a senior manager in the head office since he/she was deemed to possess the required knowledge about all study variables.

Due to a large number of respondents, the researcher used a "drop and pick later" method. The researcher also sent emails and made phone calls to follow up on the questionnaires not received. To enhance cooperation from the respondents, an introduction letter from the university explaining the aim of the research, its academic purpose and assuring respondents of confidentiality accompanied the questionnaire. Follow-ups in terms of letters, emails and telephone calls were carried out in subsequent weeks during data collection to boost the response rate.

3.7 Operationalization of Research Variables

Six constructs were included in this study. They are; green logistics practices, firm characteristics, environmental performance, economic performance, social performance and firm performance. The multi-item indicator was used to

operationalize each of these variables and measured with the help of a Likert scale. According to Chimi and Russel (2009), nearly all fields of scholarly and business research use the Likert scale. A wide review of both empirical and conceptual literature formed the measurement scales for each of the constructs and consequently deemed to have face validity. Table 3.1 shows the operational definitions and measurement of the study variables.

Table 3. 1   Operationalization of Research Variables

Latent Constructs	Sub constructs	Indicator	Informing Literature	Measurement Scale	Question
Green Logistics Practices	• Green Packaging	Appendix III(a)	Wu & Dunn, 1995; Laosirihongthong et al., 2013; Molina-Besch & Pålsson 2014.	Five-point Likert type scale	Section B, Question. 5
	• Fuel Efficiency	Appendix III(b)	Lars, Hampus, & Henrik, 2014.	Ordinal scale	Section B, Question. 6
	• Optimization of Routes	Appendix III(c)	Weng & Chen, 2015.		Section B, Question 7
	• Carbon Emissions Management	Appendix III(d)	McKinnon, Browne & Whiteing, 2012.		Section B, Question 8
	• Reverse Logistics	Appendix III(e)	Wu & Dunn, 1995; Krumwiede & Sheu, 2002; Rao, 2007.		Section B, Question 9
Firm Characteristics	• Ownership	Local Foreign Both Local and Foreign	Fazlzadeh, Hendi & Mahboubi, 2011; Ebrahim, Abdullah & Faudziah, 2013.	Nominal scale	Section A, Question 2.
	• Size	Fleet Size (Number of trucks)	Kisengo & Kombo, 2012; Kipesha, 2013; Lee & Cheng, 2013.	Ratio Scale	Section A, Question 3.
	Possession of EMS	Presence of an EMS	Hassan, Balan, & Prakash, 2016	Nominal scale	Section A, Question 4
Environmental Performance	• Waste produced • Energy usage • Air and water quality	Appendix IV(a)	Zhu & Sarkis, 2008; Iraldo et al., 2009; Testa & Irlado, 2010; Kung et al., 2012	Five-point Likert type Scale Ordinal scale	Section C, Question 10

Latent Constructs	Sub constructs	Indicator	Informing Literature	Measurement Scale	Question
Economic Performance	Cost-cutting on: • Material purchased • Energy consumed • Waste treated • waste discharged, • Fines due to environmental accidents.	Appendix IV(b)	De Giovanni, 2012; Savitz & Weber, 2006; Hampus & Henrik, 2014; Zhu et al., 2008	Five-point Likert type scale Ordinal scale	Section D, Question 11
Social Performance	• Human rights • Labour practices • Product responsibility • Community impacts • Corporate Image	Appendix IV(c)	Graves & Waddock, 1997; Lin, Yang, & Liou, 2009; Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Wagner, 2010	Five-point Likert type scale Ordinal scale	Section E, Question 12
Firm Performance	Balanced scorecard perspectives • Financial • Customer • Internal processes • Learning and growth	Appendix IV(d)	Claycomb, Dröge, & Germain, 1999; Kaplan & Norton, 2010; Antônio, Cunha, & Lisa, 2015	Five-point Likert type Scale Ordinal scale	Section F, Question 13

3.8 Reliability and Validity of Instrument

The reliability and validity of the study instrument are very important to maintain its precision. Tests for reliability and validity were established at various levels. The following subsections discuss the tests that were conducted.

3.8.1 Reliability Test

The assessment of the extent to which measures are free from error is reliability. Therefore, the main objective of reliability is the reduction of errors and production of consistent results (Zikmund, 2003). Bernard (2000) indicated that it relates to the level whether similar results can be achieved when using the instruments to assess a repeated thing. Reliability measurement is done using three frequently used methods – construct reliability (CR), average variance extracted (AVE), Cronbach's Alpha (Barbara, 2010; Kline, 2011). Before scale evaluation, reliability is performed; unidimensionality is first examined, as lack of it can result in the occurrence of correlation between artificial constructs. Consequently, as suggested by Wong (2002), checks on reliability analysis and unidimensionality were performed on all the scales adopted in this research. Measurement of the dimensions of items was done using the Cronbach Alpha, Sekaran (2000) indicated that this is predominantly vital when research employs a multiple-item scale like the five-point Likert scale. It assesses the internal consistency of items and their value should be at least 0.70 (Kline, 2011).

According to Barbara (2010), unidimensionality cannot be measured by Alpha values alone and recommends that it is also imperative to assess reliability by employing CFA. A more appropriate measure might be the construct reliability, as it does not assume equal weight for all indicators. It is recommended to be greater than 0.70.

Furthermore, AVE denotes the quantity of variance extracted by a construct from its items. Measurement errors are the cause of the variance. Hence, it is vital to use the AVE approach to confirm reliability. It is recommended that the AVE value should to be 0.50 or greater (Chiang, Kocabasoglu-Hillmer, Suresh, 2012).

Construct reliability is a measure of steadiness of the set of indicators representing a construct. It is routine to use Cronbach's Alpha (α) for this purpose (Cronbach, 1951). The study aimed to maximize α, researchers largely accept values above 0.7 as an indicator of internal consistency. Besides, Fornell and Bookstein (1982) recommended the acceptable construct reliability (CR) score to be 0.7 or higher. Therefore, internal consistency method was used in measuring the reliability of the survey instrument in this research.

3.8.2 Validity Test

The extent to which an instrument measures what it is supposed to measure is referred to as validity. Measures of validity are content and construct validity. Content validity is defined as how wide a specific area of content is mirrored by experimental measurement. Zhang (1999) indicates that it sets a strong basis to institute a broad assessment of the validity of the survey instrument systematically. Construct validity is the extent to which a test measures what it purports to be measuring. It consists of convergent validity and discriminant validity. Parasuraman, Zeithaml, and Berry (1991) asserted that convergent validity is the degree to which scale items are alleged to be representing a construct based on an array of facts on the same constructs. Wong (2002) indicated that a way of thinking that is theoretically based on the capability of a measure to assess the fundamental truth in a given area is referred to as discriminant validity.

To take care of content or face validity, the measurement instrument was developed from literature with the help of academic experts. Industry experts in the logistics area were also employed to pre-test the tool and assess the questions' content validity. The respondents were asked to assess the quality of the survey instrument in terms of its clarity, wording, and relevance. The questionnaire was pretested on ten logistics managers in the logistics firms before embarking on data collection (Cooper & Schindler, 2010). Issues raised were then used to adjust the questionnaire for a final draft to be realized.

Convergent validity was assessed by factor loadings or regression weights and average variance extracted (AVE). Regarding factor loadings, the standardized regression weights should be higher than 0.5, at a minimum statistically significant (Jayasinghe-Mudalige, Udugama, & Ikram, 2012). The method for establishing discriminant validity is the comparison of the squared correlation between two variables with either of their AVE estimates which should be greater compared to the squared correlation estimate (Hair et al., 2010).

3.9 Data Diagnostics

Multicollinearity refers to a situation where at least two independent variables in a representation are highly correlated, making it cumbersome to delineate their attributes on the endogenous variable. Multicollinearity was checked by using two measures, tolerance, and variance inflation factor (VIF). Heteroscedasticity is a situation where previous error terms influence other error terms hence violating the statistical assumption that error terms have a constant variance. This was checked by using the scatter plots. Data normality was tested using Shapiro-Wilk's test. Cook's

distance was used to check for outliers and consequently linearity. The absence of autocorrelation was checked by use of Durbin Watson test.

3.10 Data Analysis

Data was analysed using covariance-based structural equation modelling (CB-SEM). Structural Equation Modelling technique using Analysis of Moment Structures (AMOS) software was used for data analysis to achieve the first, second and third objectives. To test predictive models CB-SEM regression uses a two-stage procedure. The first step is the evaluation of the measurement or outer model to determine the constructs validity and reliability used to measure the study variables. The second step is the assessment of the structural or inner model, which tests the hypotheses under investigation (Ringel et al., 2011).

CB-SEM assumes unidirectional causal relationships or, linear relationships, between the latent variables and research indicators (Bryne, 2001). It integrates observed and latent variables. The outer or measurement model measures the validity and reliability of the latent variable indicators while the structural or inner model describes the indirect and direct associations among the latent variables and describes the extent of unexplained and explained variances (Hair et al., 2013). The analytical models are presented in Table 3.2.

Table 3.2   Summary of the Objectives, Hypotheses, Analytical Method and Interpretation

Objective	Hypotheses	Analytical Models	Interpretation of Results
To establish the effect of green logistics practices on performance of logistics firms in Kenya	H1: Green logistics practices have a positive effect on the firm's performance.	CB-SEM Analysis	The hypothesis is supported if Normed chi-square (χ^2/d.f.) is between 1 and 3, CFI value is greater than 0.95, SRMR is less than 0.08, RMSEA is less than 0.06 and p-values of path coefficient is less than 0.05
To determine the influence of firm characteristics on the relationship between green logistics practices and performance of logistics firms in Kenya	H2: Firm characteristics moderate the relationship between green logistics practices and firm's performance.	CB-SEM Analysis	The hypothesis is supported if χ^2/d.f. is between 1 and 3, CFI >0.95, SRMR < 0.08, RMSEA < 0.06 and p-values < 0.05.
To examine the influence of environmental performance on the relationship between green logistics practices and firm's performance.	H3: The relationship between green logistics practices and firm's performance is mediated by environmental performance.	CB-SEM Analysis	The hypothesis is supported if χ^2/d.f. is between 1 and 3, CFI >0.95, SRMR < 0.08, RMSEA < 0.06 and p-values < 0.05.
To ascertain the influence of economic performance on the relationship between green logistics practices and firm's performance	H4: The relationship between green logistics practices and firm's performance is mediated by economic performance.	CB-SEM Analysis	The hypothesis is supported if χ^2/d.f. is between 1 and 3, CFI >0.95, SRMR < 0.08, RMSEA < 0.06 and p-values < 0.05.

Objective	Hypotheses	Analytical Models	Interpretation of Results
To examine the influence of social performance on the relationship between green logistics practices and firm's performance.	H5: The relationship between green logistics practices and firm's performance is mediated by social performance.	CB-SEM Analysis.	The hypothesis is supported if χ^2/d.f. is between 1 and 3, CFI >0.95, SRMR < 0.08, RMSEA < 0.06 and p-values < 0.05.
To ascertain the combined effect of green logistics practices, firm characteristics, environmental performance, economic performance, and social performance on firm performance	H6: The relationship between green logistics practices, firm characteristics, environmental performance, economic performance, and social performance with firm performance is significant	CB-SEM Analysis.	The hypothesis is supported if χ^2/d.f. is between 1 and 3, CFI >0.95, SRMR < 0.08, RMSEA < 0.06 and p-values < 0.05.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

The analyses conducted to test the conceptual model and the results reports of this study are presented in this chapter. It delivers information on respondent characteristics and demographics of the population, data screening, response rates, measurement differences, test results for non-response bias and measurement model estimation and the testing of the hypotheses. For this study, the collected data was analysed into two different stages. In stage one, SPSS version 23 was employed for descriptive statistics about the respondents and the preliminary data analysis such as outliers, missing values, mean and standard deviation, kurtosis and skewness. The second stage, CB-SEM used AMOS version 23.0 to scrutinize the connections among variables in the conceptual model. The findings are presented based on the study objectives and the respective hypotheses tested.

4.2 Background Information

The overall objective of this research was to confirm the relationship between green logistics practices and performance of logistics firms in Kenya. Specifically, the study first sought to establish the influence of green logistics practices on the performance of logistics firms. The second aim of this study was to examine the effect of firm characteristics (firm size, ownership, and presence of an environmental management system) on the link between green logistics practices and firm performance. The third, fourth and the fifth objectives sought to establish the effect of environmental performance, economic performance, and social performance respectively on the link between green logistics practices and firm performance. The sixth aim of this study was to determine the joint influence of green logistics practices, firm characteristics,

economic performance, environmental performance and social performance on firm performance.

4.3 Response Rate

Questionnaires were sent to selected logistics firms in Kenya, whose data was provided on the KIFWA website in 2018. The questionnaires were sent to a total of 300 logistics firms and 233 questionnaires were received back. A total of 67 firms did not respond or declined to participate with some citing to have a "no-survey" policy. There were also monitoring difficulties because of geographical distance. Some firms were unavailable to respond while others flatly refused to respond to the questionnaire. This resulted in a response rate of 77.67% as indicated in Table 4.1. This number was considered sufficient for SEM with nine constructs, as per the recommendation by Hair et al. (2010) no commonalities were lower than 0.45. Based on this affirmation, the response rate was exemplary for analysis and concluding. Data analysis was commenced with the confirmation of the completeness of the research instrument.

Missing data is a prominent issue in the analysis of data that may affect the results of the research (Hair et al., 2010). Following the recommendations of Meyer et al. (2013), frequency tables in SPSS were used to identify erroneous or missing data. This revealed that 20 questionnaires had at least 10% missing data or had missing data on key performance variables. These questionnaires were eliminated from preliminary analysis leaving 213 usable questionnaires. Out of the 213 usable questionnaires, 55 had less than 10% missing data; the rest had no missing data.

The missing data could have been due to the oversight by the respondent and perceived confidentiality of data, survey fatigue caused by a high frequency of

surveys, reluctant approach of the respondents because they did not understand how the overall research would be beneficial to them, or the information sought by the question was not available. A subgroup median value replacement function was used to impute those 55 questionnaires with less than 10% missing values. Lowry and Gaskin (2014) recommended usage of median imputation for ordinal variables measured using Likert scale. This resulted in 213 data sets resulting in a response rate of 71%. Table 4.1 presents the response rate information.

Table 4.1   Response Rate Distribution

Response	Frequency	Response Rate (%)	Usable Questionnaires	Adjusted response rate (%)
Responded	233	77.67	213	71
Not responded	67	22.33		
Total	300	100		

Source: Research Data (2020)

4.4 Firm Demographics

The characteristics of logistics firms that took part in the research were collected, reviewed and analysed based on data on the questionnaire. The study captured several characteristics of the firms surveyed. Firm demographics captured included; respondent's position in the firm, ownership status of the firm, the fleet size and presence of an environmental management system. However, some of these demographic data did not influence the analysis level but it aided in giving general information about the study population.

Table 4.2 summarises the data on the characteristics of the study respondent's firms. The respondents were asked to specify the category they belonged in the management hierarchy. Preliminary analysis of firm characteristics indicated that 21.1 per cent of the respondents were in the topmost management, 40.8 percent were in the middle-

level management, 19.7 per cent were in the supervisory level while 18.3 per cent were found to be in the non-managerial level of management. This implied that all the management hierarchies fairly participated in this study. Majority of the respondents (62 per cent) are in either top or middle-level management implying that they possess the required knowledge about green logistics.

The study required the respondents also to indicate the ownership status of the firms. As indicated in Table 4.2, majority (66.7 per cent) of the respondents pointed out that their organizations were locally owned, 3.3 per cent indicated their firms were owned by foreigners and 30 per cent indicated that both locals and foreigners owned their firms. Firm ownership indicates a source of authority that a firm can use to support decision-making. This is so specifically in nations with feeble legal structures where safeguarding the investors' interests takes centre stage. A majority of the firms being local fits well into the study context, which are logistics firms in Kenya having no external influence of other countries.

The respondents were also expected to indicate the number of trucks owned or outsourced by the firm. The bulk of the firms with a representation of 72.3 per cent are classified as small with less than 20 trucks, while 13.1 per cent had between 20 and 50 trucks, 4.7 per cent of the firms had between 51 and 100 trucks, while 9.9 per cent had more than 100 trucks. This implies that Kenya's logistics industry is still at its infancy stage of growth and therefore a fertile ground for research, which will shape the future growth of this industry.

To get a clue of the respondent's familiarity with the environmental management of the firm, they were asked to indicate whether the firm had an environmental management system. About 67.6 per cent of the firms had some form of EMS. Only

69 firms did not have any form of EMS which is an indication that most of the firms have a deeper understanding of environmental management. Firms with an environmental management system are involved more in green initiatives compared to ones without due to the systems requirements.

Table 4.2   Firm Demographics

Features	Categories	Frequency	Per cent (%)
Management Hierarchy	Top management	45	21.1
	Middle Management	87	40.8
	Supervisory level	42	19.7
	Non-managerial	39	18.3
	Total	213	100
Ownership status of the firm	Local	142	66.7
	Foreign	7	3.3
	Both Local and Foreign	64	30
	Total	213	100
Fleet Size	Less than 20 trucks	154	72.3
	20 to 50 trucks	28	13.1
	51-100 trucks	10	4.7
	More than 100 trucks	21	9.9
	Total	213	100.0
Presence of EMS	Yes	144	67.6
	No	69	32.4
	Total	213	100.0

Source: Research Data (2020)

4.5 Diagnostic Tests

Hair et al. (2010) indicated that in multivariate analysis, testing the existence of normality is vital since the reliability and validity of the results are affected if data is not normally distributed. Jarque-Bera (skewness-kurtosis) test was employed in this research to check if the data were normally distributed. The value of skewness shows

the distribution symmetry. A negative skewness value shows that the distribution is budged to the right; while positive skewness value shows a left shift.

Pallant (2010) alluded that kurtosis gives information about the distribution height. A positive kurtosis value shows a peaked distribution while a negative value is an indicator of a distribution that is flatter. Kurtosis values of more than 1 or less than -1 point out a potential problem. Economic performance, social performance and environmental performance indicated values that were more than the threshold but less than 3 as shown in Table 4.3. While this does infringe the strict normality rule, it is within the more relaxed rules recommended by Spotiso et al. (1983) who suggested 3.00 as the upper threshold for normality.

Table 4.3   Tests of Normality of the Study Variables Using Skewness and Kurtosis

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Economic Performance	213	.434	.167	-1.108	.332
Environmental Performance	213	.447	.167	-1.067	.332
Firm Performance	213	-.914	.167	.570	.332
Green Logistics Practices	213	-.535	.167	.101	.332
Social Performance	213	-1.392	.167	2.260	.332

Source: Research Data (2020)

Additionally, the Shapiro-Wilk test was used to check the normality assumption as shown in Table 4.4. A value that is positive and less than or equal to one is a show of normality. On the other hand, according to Razali and Wah (2011), if the p-value is larger than the selected level of alpha (0.05), then the data is normally distributed. From the results shown in Table 4.4, all values were above 0.05 meaning that the research variables were normally distributed.

Table 4.4   Test of Normality Using Shapiro-Wilk Test

Variables	Sample Size	Shapiro-Wilk Test
Firm performance	213	.931
Economic performance	213	.902
Environmental performance	213	.901
Green Logistics Practices	213	.955
Social performance	213	.805

Source: Research Data (2020)

Multicollinearity is caused by a strong correlation between two or more independent variables in a regression model. For the multiple regression, latent variable scores were used as input. The exogenous latent variables, which include green logistics practices, economic performance, environmental performance and social performance, were configured as independent variables, whereas firm performance was configured as the dependent variable.

Multicollinearity assumption is that VIF threshold value should be 3 or less and was used to test for non-dependence of the independent variables because when independent variables are highly correlated it is hard to determine the actual contribution of respective predictors. Multicollinearity was tested by computing VIF and its reciprocal, the tolerance. In this research tolerance ranged from 0.354 to 0.653 and therefore it's reciprocal, VIF was between one and two, way below the threshold and the results are presented in Table 4.5. This ensured that there was no possibility of data collinearity (Hair et al., 1995).

Table 4.5   Test of Multicollinearity Using Tolerance Test

Model	Collinearity Statistics	
	Tolerance	VIF
Economic Performance	.354	2.825
Environmental Performance	.365	2.742
Green Logistics Practices	.653	1.531
Social Performance	.617	1.621

a. Dependent Variable: Firm Performance   Source: Research Data (2020)

An assumption is made that the residual value for any observation must be uncorrelated (independent). This assumption was checked using the Durbin–Watson test, as it checks for autocorrelations which may exist among residuals. A value of 2.0 indicates no autocorrelation. Values from zero to less than two show positive autocorrelation while values from two to four indicate negative autocorrelation (Lu et al., 2010). As shown in Table 4.6 the value obtained is 2.121 pointing the absence of autocorrelation.

Table 4.6   Test of Auto-correlation Using Durbin-Watson Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.899[a]	.808	.804	.24244	2.121

a. Predictors: (Constant), Green Logistics Practices, Environmental Performance, Social Performance, Economic Performace.
b. Dependent Variable: Firm Performance

Homoskedasticity was tested using a scatter plot which can show the variance of statistical dispersion. As indicated in Figure 4.1, the data points pattern is concerted together without a pattern to the residuals plotted against the fitted values. This indicated a constant variance of the residuals and consequently deducing that the variance of the residuals was similar across levels of the predicted values. Furthermore, as suggested by Field (2009), the residuals indicated most of the scores concentrated in the centre, around zero. The shape formed a pattern-less mist of dots suggesting that the homoskedasticity assumption was met.

Figure 4.1   Tests of Heteroskedasticity Using Scatter Plots
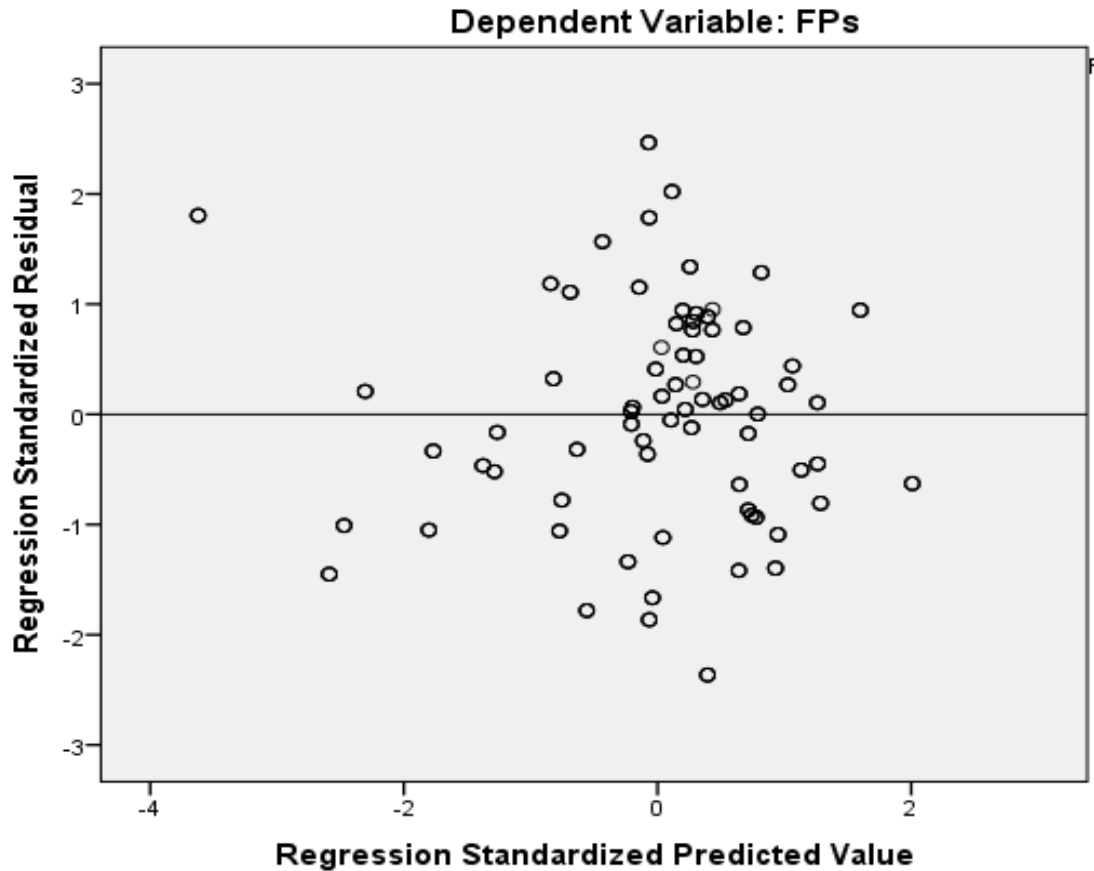
4.6 Reliability and Validity

This research had five broad constructs, which included green logistics practices, economic performance, social performance, environmental performance, and firm performance. Green logistics practices were further subdivided into five sub-constructs. The internal consistency and reliability were estimated for the items representing each construct by getting the item to total correlation scores for every item for all the constructs in the research. The measurement scale for each construct was refined further by only retaining for further analysis, indicators with the item to total correlation values of above 0.3.

To confirm construct validity, factor analysis was conducted. Costello and Osborne (2005) suggested that the use of Kaiser Meyer-Olkin (KMO) and Bartlet test of sphericity to check the factorability, adequacy of the sample and appropriateness of the items in the latent construct. For the sample and factor extracted to be perfect, KMO values should be greater than 0.5. Bartlett's Test of Sphericity revealed that all latent constructs have values of chi-square that are significant at a level of less than 0.001 (Barlett, 1954). As shown in Table 4.7 all KMO Measures were found to be above the threshold of 0.6 (Kaiser, 1974). These two tests mean that it was appropriate to subject the items representing the latent constructs to factor analysis. For constructs that were subjected to EFA, CFA was performed using Amos 23 software for measurement model estimation. Following are the outlines of scale purification for each construct.

Table 4.7   Results for KMO and Bartlett's Test

Latent Construct	KMO Measure	Bartlett's Test of Sphericity Approx. Chi-Square	df	Sig.
Green packaging practices	.871	1000.681	21	.000
Fuel efficiency practices	.853	682.504	21	.000
Optimization of routes practices	.849	552.130	6	.000
Carbon Emission Measurement Practices	.806	888.261	15	.000
Reverse logistics practices	.896	552.130	45	.000
Environmental impact	.911	1241.160	15	.000
Economic impact	.848	617.298	10	.000
Social impact	.826	1065.840	55	.000
Financial perspective	.745	532.347	3	.000
Customer perspective	.655	107.189	3	.000
Internal processes perspective	.742	352.604	3	.000
Learning and growth perspective	.827	570.905	15	.000

Source: Research Data (2020)

4.6.1 Green Logistics Practices

Green logistics practices concept was measured using five subscales each with a number of practices, which included green packaging practices, fuel efficiency practices, optimization of routes practices, carbon emission measurement practices

and reverse logistics practices. The subsequent subsections discuss the results attained for each of the practices.

4.6.1.1 Green Packaging Practices

The green packaging construct was assessed using seven practices rated on a five-point Likert scale with 1 being "not at all" and 5 being "to a very great extent". As shown in Table 4.8, the responses ranged from a mean of 2.81 to 3.04 implying that the respondents practised green packaging from a little to a moderate extent. The uppermost rating was 3.04 for the practice "adopting systems that encourage returnable packaging methods" with a standard deviation of 1.33 from 213 responses. The practice "altering the shape of products or reducing the size to eliminate or curb the need for packaging, by arranging products in different ways or condensing liquid formulas" had the lowest rating with a mean of 2.81 and standard deviation of 1.458 from 213 responses. The grand mean for green packaging practices was 2.93 suggesting that the logistics firms had executed them to slightly below moderate extent.

All construct items are adequately normally distributed with kurtosis and skewness coefficients within the range of -3.00 and +3.00. The range for factor loadings was from 0.681 to 0.868 for all items, which was found to be above the recommended threshold of 0.5. The Cronbach's Alpha reported was 0.913, being above the cut off point of 0.7. The Item to total correlations range was from 0.645 to 0.814 for all items which are above 0.3 threshold. Since all the items met the requisite thresholds for construct validity and reliability, they were all included in the list of items for the measurement model.

Table 4.8   Green Packaging Practices

Green Packaging Practices	N	Mean	Std. Deviation	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Recyclable materials (bio-plastic, paperboard, cardboard) when packaging for vendors	213	2.86	1.243	-.101	-.863	0.681	.655	.908
Packaging using natural materials like dye-free paper which are less hazardous to the environment	213	2.97	1.234	-.241	-.840	0.782	.758	.898
Custom created packaging boxes to preserve materials and space throughout the distribution process.	213	2.90	1.326	-.148	-1.123	0.774	.745	.899
Making constant effort to find new reusable materials for packaging	213	3.00	1.298	-.309	-.970	0.812	.772	.896
Altering the shape of products or reducing the size to curb the need for packaging, by arranging products in different ways or condensing liquid formulas	213	2.81	1.458	.008	-1.347	0.695	.645	.911
Cooperating with vendors to use life cycle assessment to evaluate the environmental impact of packaging during design and to standardize packaging	213	2.91	1.332	-.141	-1.162	0.868	.814	.891
Adopting systems that encourage returnable packaging methods	213	3.04	1.328	-.423	-1.084	0.826	.775	.896

Cronbach's Alpha = 0.913   Grand mean = 2.93   Source: Research Data (2020

4.6.1.2 Fuel Efficiency Practices

Five practices were used to measure the fuel efficiency construct, rated on a five-point Likert scale with 1 being "not at all" and 5 being "to a very great extent". The responses ranged from a mean of 3.49 to 4.11 as shown in Table 4.9, suggesting that the respondents practised green packaging from a moderate to a great extent. The highest rating was 4.11 for the practice "We ensure correct tyre maintenance to enhance fuel-efficiency" with a standard deviation of 0.897 from all 213 responses. The practice "We leverage technology (i.e. taking advantage of on-board diagnostics systems and new telematics) that aid in analysing fuel purchases and vehicle performance" had the lowest rating with a mean of 3.49 and standard deviation of 1.152 from 213 responses.

The grand mean was 3.86 indicating that the logistics firms had executed them to a great extent. The coefficients for skewness and kurtosis are within the -3.00 and +3.00 threshold indicating normality of the data. The factor loadings ranged from 0.581 to 0.836 for all items, which is above the 0.5 thresholds. Cronbach's Alpha was 0.864, which is higher than the threshold of 0.7. The Item to total correlations range was from 0.570 to 0.742 for all items which are above 0.3 threshold. Since all the items met the required thresholds for construct validity and reliability, they were all included in the list of items for the measurement model.

Table 4.9: Fuel Efficiency Practices

Fuel Efficiency Practices	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Training drivers to practice fuel-efficient driving techniques	213	3.71	1.128	-.852	.209	0.658	.570	.856
Ensuring correct tyre maintenance to enhance fuel efficiency	213	4.11	.897	-1.284	2.305	0.836	.742	.833
Using fuel-efficient vehicles.	213	4.00	.880	-1.260	2.374	0.781	.696	.839
Implementing a continuous preventive maintenance program for vehicles.	213	4.02	.934	-.889	.981	0.727	.655	.843
Leveraging technology that aid in analysing fuel purchases and vehicle performance.	213	3.49	1.152	-.768	-.064	0.581	.572	.856
Integrating real-time visibility of inventory in the warehouses aimed at reducing unnecessary trips	213	3.78	.971	-.614	.245	0.664	.656	.842
Organizing supplier consignments to combine freight costs and negotiate better rates and leverage multiple modes (e.g. Use of the railway line).	213	3.90	1.084	-1.150	.911	0.639	.616	.848

Cronbach Alpha = 0.864   Grand mean = 3.86   Source: Research Data (2020)

4.6.1.3 Optimization of Routes Practices

This construct was also measured using four practices ranked on a five-point Likert scale with 1 being "not at all", and 5 being "to a very great extent". The responses ranged from a mean of 3.22 to 3.61 as shown in Table 4.10 implying that the respondents practised optimization of routes from a moderate to a moderate extent. The highest rating was 3.61 for the practice "Our organization has statistics on driver and fleet to offer an enhanced level of understanding of fleets operational efficiency and help in pinpointing areas where costs can be reduced or improve productivity like in regrouping of goods" with a standard deviation of 1.256 from 213 responses. The practice "Our company provides a graphical view of the calls to a driver, re-calculating automatically the route when a driver selects a manual stop which is out-of-sequence" had the lowest rating with a mean of 3.22 and standard deviation of 1.222 from 213 responses.

The grand mean for optimization of routes practices was 3.41 suggesting that the logistics firms had applied them to moderate scope. The skewness and kurtosis indicate normally distributed data. The range of factor loadings was from 0.787 to 0.880 for all items, which is above the 0.5 thresholds. Cronbach's Alpha was 0.907, which is greater than the threshold of 0.7. The Item to total correlations range was from 0.746 to 0.821 for all items which are above 0.3 threshold. Since all the items met the necessary thresholds for reliability and construct validity, they were all included in the list of items for the measurement model.

Table 4.10   Optimization of Routes Practices

Optimization of Routes Practices	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Positioning in real-time using precise geo-coding (GPS) to present a map view of the current positions of vehicles	213	3.53	1.337	-.623	-.756	0.849	.800	.878
Directing drivers by automatically providing driving directions based on run sheet data to the trucks next stop.	213	3.29	1.220	-.596	-.562	0.88	.821	.870
Providing a graphical view of the calls to a driver, re-calculating automatically the route when a driver selects a manual stop, which is out-of-sequence.	213	3.22	1.222	-.493	-.553	0.787	.746	.895
Having statistics on driver and fleet to offer an enhanced level of understanding of fleets operational efficiency and help in pinpointing areas where costs can be reduced or improve productivity like in regrouping of goods.	213	3.61	1.256	-.872	-.248	0.857	.800	.877
Cronbach Alpha=0.907			Grand mean 3.41				Source: Research Data (2020)	

4.6.1.4 Carbon Emission Measurement Practices

Carbon emission measurement construct was checked using six practices rated on a five-point Likert scale with 1 being "not at all" and 5 being "to a very great extent". The responses ranged from a mean of 2.57 to 3.97 implying that the respondents practised carbon emission measurement from a little extent to a great extent as shown in Table 4.11. The maximum rating was 3.97 for the practice "For small consignments we use vehicles with less engine capacity or even motorbikes." with a standard deviation of 1.228 from 213 responses. The practice "Our company has a purchased carbon offset to compensate all carbon emissions caused by our vehicles e.g. tree planting" had the lowest rating with a mean of 2.57 and standard deviation of 1.377 from 213 responses. Carbon emission measurement practices grand mean was 3.04 indicating that the logistics firms had applied them to a moderate extent. Data is normally distributed as per the skewness and kurtosis coefficients.

The coefficients for factor loadings ranged from 0.412 to 0.975 meaning that some items loaded below the 0.5 thresholds. The practices "replacing older vehicles with newer ones, which emit less to the environment" (CEc), "using vehicles with less engine capacity for small consignments" (CEd), had factor loads of 0.487 and 0.412 respectively. Since these two items did not meet the required thresholds for reliability and construct validity, they were eliminated from the list of items for the measurement model. The remaining four items had an improved Cronbach's Alpha of 0.919 from 0.823 which is above the threshold of 0.7 and all the factor loadings were also above 0.5. The Item to total correlations range was from 0.472 to 0.854 for all items which are above 0.3 threshold.

Table 4.11   Carbon Emission Measurement Practices

Carbon Emission Measurement Practices	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Obtaining from vehicle manufacturers a Life Cycle Assessment (LCA) showing the complete carbon emission from the vehicle assembly to its usage and its disposal.	213	2.71	1.366	.026	-1.363	0.76	.699	.862
Purchasing carbon offsets to compensate for all carbon emissions caused by our vehicles e.g. tree planting.	213	2.57	1.377	.190	-1.317	0.798	.733	.856
Replacing older vehicles with newer ones, which emit less to the environment.	213	3.55	1.214	-.574	-.507	0.487	.581	.880
Using vehicles with less engine capacity for small consignments	213	3.97	1.228	-1.195	.518	0.412	.472	.895
Carbon emission report has all information needed for decision making by both the external and internal users.	213	2.79	1.430	.084	-1.443	0.92	.827	.839
Carbon emission information is reported in a coherent, neutral and factual manner based on audit trail, which is clear.	213	2.66	1.397	.087	-1.433	0.975	.854	.835

Cronbach Alpha=0.883   Grand mean=3.04   Source: Research Data (2020)

4.6.1.5 Reverse Logistics Practices

The reverse logistics construct was measured using ten practices rated on a five-point Likert scale with 1 being "not at all" and 5 being "to a very great extent". The responses ranged from a mean of 2.51 to 3.49 implying that the respondents practised reverse logistics from a little extent to a moderate extent as indicated in Table 4.12. The maximum rating was 3.49 for the practice "Our firm makes customers aware of product recall service provided by the company." with a standard deviation of 1.355 from 213 responses. The practice "Our firm offers special motivations to those who return packaging materials" had the lowest rating with a mean of 2.51 and a standard deviation of 1.396 from 213 responses.

The grand mean for reverse logistics practices was 3.08 suggesting that the logistics firms had executed them to a moderate extent. The skewness and kurtosis coefficients indicate normally distributed data. The range of factor loadings was from 0.650 to 0.857 for all items, which is above 0.5 thresholds. Cronbach's Alpha was 0.934, which is above the 0.7 threshold. The Item to total correlations range was from 0.640 to 0.817 for all items which are above 0.3 threshold. Since all the items met the required thresholds for reliability and construct validity, they were all included in the list of items for the measurement model.

Table 4.12   Reverse Logistics Practices

Reverse Logistics Practices	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Offering product vendors, the product recall or packaging return or take-back service	213	3.17	1.292	-.504	-.958	0.771	.753	.927
Making customers aware of product recall service provided by the company	213	3.49	1.355	-.594	-.826	0.729	.705	.929
Providing logistics service for reusable containers to product vendors	213	3.47	1.265	-.644	-.499	0.695	.690	.930
Providing logistics service for on-site disposition	213	3.37	1.243	-.368	-.761	0.65	.640	.932
Providing to product vendors, rework services for their returned products	213	3.09	1.370	-.304	-1.235	0.857	.817	.924
Receiving logistics services from a vendor for liquidation of returned products	213	2.85	1.335	-.121	-1.316	0.808	.760	.927
Offering special motivations to those who return packaging materials.	213	2.51	1.396	.363	-1.241	0.731	.711	.929
Providing suitable guidance to clients on the environmental aspects of handling, usage, and disposal of the vendor's products.	213	2.90	1.283	-.098	-.998	0.833	.790	.925
Returning used packaging and products to suppliers for recycling or reuse	213	2.90	1.352	-.169	-1.190	0.803	.776	.926
Offering consolidates freight in cases where used material and packaging is to be shipped back to the vendor.	213	3.03	1.361	-.320	-1.153	0.776	.742	.927

Cronbach Alpha = 0.934   Grand Mean = 3.080   Source: Research Data (2020)

4.6.2 Environmental Performance

The environmental performance construct was measured by asking the respondents to indicate the percentage reduction that their firms had experienced. These ranges were organized into five groups. 1 represents a reduction of 20% and below, 2 represented a reduction of 21 to 40%, 3 represents a reduction of 41 to 60%, 4 represents a reduction of 61 to 80% and 5 represents a reduction of over 80 to 100%. The construct had six items. The responses ranged from a mean of 2.30 to 2.50 with a grand mean of 2.43 implying that on average, the firms had experienced a reduction of between 21 to 40% because of implementing green logistics practices as indicated in Table 4.13. The highest rating was 2.50 for the item "Solid waste reduction e.g. damaged/unusable vehicle parts" with a standard deviation of 1.287 from 213 responses. The item "Fume emissions reduction" had the lowest rating with a mean of 2.30 and a standard deviation of 1.326 from 213 responses.

The values for skewness and kurtosis indicate normally distributed data. The item "Fume emissions reduction" had the lowest rating with a mean of 2.30 and a standard deviation of 1.326 from 213 responses. The factor loadings ranged from 0.767 to 0.906, all above 0.5 threshold and the range of item to total correlations was from 0.746 to 0.889. Cronbach's Alpha value was 0.948 indicating high reliability. Since all the items met the required thresholds for construct validity and reliability, they were all included in the list of items for the measurement model.

Table 4.13   Environmental Performance

Environmental Performance	N	Mean	Std. Deviation	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Fume emissions	213	2.30	1.326	.572	-.959	0.9	.864	.935
Oil waste/Spillage.	213	2.46	1.432	.504	-1.121	0.901	.860	.936
Solid waste reduction e.g. damaged/unusable vehicle parts.	213	2.50	1.287	.454	-.936	0.831	.808	.942
Amount of fuel used	213	2.43	1.377	.433	-1.191	0.767	.746	.949
General quality of environment through reduced noise pollution	213	2.50	1.362	.333	-1.315	0.903	.880	.933
Consumption of dangerous and toxic substance like usage of diesel for our vehicles.	213	2.38	1.391	.547	-1.060	0.906	.889	.932

Cronbach Alpha=0.948   Grand mean= 2.43   Source: Research Data (2020)

4.6.3 Economic Performance

Economic performance construct was measured by requesting the respondents to indicate the percentage reduction that their firms had experienced. These ranges were organized into five groups. 1 represents a reduction of 20% and below, 2 represented a reduction of 21 to 40%, 3 represents a reduction of 41 to 60%, 4 represents a reduction of 61 to 80% and 5 represents a reduction of over 80 to 100%. The construct had five items. The responses ranged from a mean of 2.17 to 2.54 with a grand mean of 2.35 implying that on average, the firms had experienced a reduction of between 21 to 40% as indicated in Table 4.14.

The maximum rating was 2.54 for the item "Traffic accidents fine e.g. insurance premiums reduction" with a standard deviation of 1.519 from 213 responses. The item "Cost of waste-oil treatment reduction" had the lowest rating with a mean of 2.17 and a standard deviation of 1.354 from 213 responses. The skewness and kurtosis values are all within the -3.00 and +3.00 threshold. Data were normally distributed based on kurtosis and skewness coefficients. The range for factor loadings was from 0.679 to 0.879, all above 0.5 threshold and item to total correlations ranged from 0.652 to 0.809. The Cronbach's Alpha was 0.891 indicating high reliability. Since all the items met the required thresholds, they were all included in the list of items for the measurement model.

Table 4.14   Economic Performance

Economic Performance	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Maintenance cost for vehicles	213	2.33	1.319	.607	-.823	0.818	.767	.860
Cost of waste oil treatment	213	2.17	1.354	.889	-.491	0.879	.809	.850
Overall oil discharge fee	213	2.26	1.308	.737	-.628	0.825	.733	.867
Traffic accidents fine e.g. insurance premiums	213	2.54	1.519	.356	-1.422	0.679	.652	.888
Overall fuel cost	213	2.45	1.402	.381	-1.289	0.75	.721	.869

Cronbach Alpha = 0.891   Grand mean = 2.35   Source: Research Data (2020)

4.6.4 Social Performance

Social performance construct was measure using eleven items rated on a five-point Likert scale with 1 being "not at all" and 5 being "to a very great extent". The responses ranged from a mean of 3.29 to 4.23 implying that the firm perceived to have attained social performance from a moderate extent to a great extent. The highest rating was 4.23 for the item "improved product responsibility e.g. Customer health and safety" with a standard deviation of 0.877 from 213 responses. The practice "Offering logistical support in providing transport or storage to humanitarian aid organizations during emergencies" had the lowest rating with a mean of 3.29 and a standard deviation of 1.208 from 213 responses.

The grand mean for social performance was 3.86 indicating that the logistics firms had experienced social performance to a slightly great extent. Kurtosis and skewness coefficients are within the -3.00 and +3.00 indicating a normally distributed data as shown in Table 4.15. The range for factor loadings was from 0.355 to 0.887 for all items, meaning that some items have a factor score below the 0.5 thresholds. These practices were "offering logistical support in providing transport or storage to humanitarian aid organizations during emergencies" (SPb), "payment of salaries that are above normal wage rate and adjusted for inflation" (SPd), "decrease in the number of vehicles getting stuck in traffic jams" (SPj) with factor loadings of 0.355, 0.495 and 0.399 respectively. They were therefore eliminated from the measurement model. After the deletion, the Cronbach's Alpha improved from 0.866 to 0.868, which is higher than the threshold of 0.7. The item to total correlations range was from 0.378 to 0.753 for all items which are above 0.3 threshold as indicated in Table 4.15.

Table 4.15   Social Performance

Social Performance	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Reduction in the number of road accidents	213	4.04	.992	-1.139	1.077	0.56	.527	.857
Offering logistical support in providing transport or storage to humanitarian aid organizations during emergencies.	213	3.29	1.208	-.372	-.978	0.355	.378	.871
Standing against human trafficking for labour.	213	4.12	1.033	-1.120	.524	0.669	.597	.852
Payment of salaries that are above the normal wage rate and adjusted for inflation.	213	3.51	1.168	-.746	-.126	0.495	.534	.858
Improved employee job satisfaction.	213	3.90	.914	-.815	.532	0.649	.616	.852
Enhanced safety and health of employees.	213	4.08	.903	-1.081	1.181	0.718	.652	.850
Increase in the number of long-distance truck drivers visiting roadside wellness centres that focus on infectious diseases and HIV.	213	3.53	1.279	-.416	-.999	0.532	.575	.855
Improved human rights advocacy e.g. avoidance of child labour.	213	4.16	.955	-1.418	2.084	0.8	.684	.847
Improved product responsibility e.g. Customer health and safety.	213	4.23	.877	-1.345	2.032	0.887	.753	.844
The decrease in the number of vehicles getting stuck in traffic Jams.	213	3.47	1.053	-.567	-.414	0.399	.430	.864
The decrease in the number of corruption cases e.g bribery.	213	4.17	.863	-1.267	1.998	0.708	.608	.853

Cronbach Alpha = 0.866   Grand mean = 3.86   Source: Research Data (2020)

4.6.5 Firm Performance

The firm performance construct was measure using eleven items rated on a five-point Likert scale with 1 being "not at all", and 5 being "to a very great extent". The responses ranged from a mean of 3.54 to 4.09 implying that the firms perceived to have experienced improved performance from a moderate extent to a great extent. The highest rating was 4.09 for the item "The number of items delivered on time to our customers (on average) has increased in the last three years" with a standard deviation of 0.769 from 213 responses. The practice "There has been an increase in the number of implemented innovations by our employees (on average) in the last three years" had the lowest rating with a mean of 3.54 and standard deviation of 0.888 from 213 responses. Firm performance grand mean was 3.74.

All variables are adequately normally distributed with kurtosis and skewness values within the acceptable threshold. The range for factor loadings was from 0.609 to 0.838 for all items, which is above the 0.5 threshold. Cronbach's Alpha was 0.931, which is higher than the 0.7 threshold. Item to total correlations greater than 0.3 were achieved for all the items in the scale ranging from 0.578 to 0.841 as indicated in Table 4.16. Since all the items met the required threshold for reliability and construct validity, they were all included in the list of items for the measurement model.

Table 4.16   Firm Performance

Firm Performance	N	Mean	Std. Dev.	Skewness	Kurtosis	Factor Loading	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Increase in profitability	213	4.09	.769	-1.097	2.657	0.694	.652	.927
Revenue growth	213	3.83	1.020	-1.018	.799	0.578	.553	.930
Increase in return on assets	213	3.66	.889	-.621	.202	0.668	.644	.927
Increase in the number of items delivered on time to customers	213	3.55	.949	-.294	.014	0.598	.618	.928
Reduction in the number of items damaged on transit	213	3.55	.992	-.313	-.255	0.633	.642	.927
Market share growth	213	3.55	.963	-.237	-.500	0.636	.653	.927
Introduction of new logistical services	213	3.75	1.077	-.931	.450	0.786	.722	.925
Increased capacity utilization e.g. optimal loading of our trucks	213	3.86	.884	-.712	.544	0.841	.799	.923
Increase in the number of logistical quality controls	213	3.91	.813	-.464	-.167	0.833	.781	.923
Increase in the number of implemented innovations by employees	213	3.54	.888	-.537	.494	0.734	.712	.925
Reduced rates of staff turnover	213	3.83	.826	-.580	.014	0.626	.607	.928
Increase productivity of employees	213	3.93	.740	-.311	-.154	0.692	.654	.927
Increase on the number of employees on self-education	213	3.58	.921	-.939	.955	0.693	.673	.926
Increase on the percentage of employees with higher education	213	3.65	1.001	-.797	.402	0.66	.649	.927
Increase in the number of training courses attended by employees	213	3.82	.941	-1.167	1.673	0.69	.651	.927

Cronbach Alpha = 0.931   Grand mean= 3.74   Source: Research Data (2020)

Given the assessment above, the final instrument consisted of nine specific constructs, which are; green packaging practices which had seven indicators, fuel efficiency practices with seven indicators, optimization of routes with four indicators, carbon emission measurement with four indicators, reverse logistics with ten indicators, environmental performance with six indicators, economic performance with five indicators, social performance with eight indicators and firm performance with fifteen indicators. The researcher, therefore, had a nine-factor solution involving sixty-six items.

The factors were adequately correlated, reliability and validity criteria were met. Factorability of the 213 sets of data was checked to measure the sampling adequacy of items. Three indicators were checked (that is; Kaiser Meyer-Olkin Measure of Sampling Adequacy, Barlett's Test of Sphericity and communalities). As shown in Table 4.16, It was established that observed variables had KMO Measures of Sampling Adequacy of 0.797, that is greater than the threshold of 0.6 (Kaiser, 1974), p-values for Barlett's test of Sphericity was less than 0.05 (Barlett, 1954). Communalities were also found to be well above 0.3 showing that the selected variables were adequately correlated for factor analysis.

Table 4.17   KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.797
Bartlett's Test of Sphericity	Approx. Chi-Square	7627.225
	Df	595
	Sig.	.000

Source: Research Data (2020)

As shown in Table 4.18, the results indicate that the scale fulfils the reliability requirement. The Cronbach's Alpha test results had values greater than 0.70. All the factors were reflective because their indicators were largely interchangeable and highly correlated (Jarvis, Mackenzie, & Podsakoff, 2004).

Table 4.18   Results of Cronbach's Alpha Reliability Test

Factor Label	Cronbach's Alpha	Specification
Green packaging practices	0.913	Reflective
Fuel efficiency practices	0.864	Reflective
Optimization of routes practices	0.907	Reflective
Carbon emission measurement	0.919	Reflective
Reverse logistics practices	0.934	Reflective
Environmental performance	0.948	Reflective
Economic performance	0.891	Reflective
Social performance	0.868	Reflective
Firm performance	0.931	Reflective

Source: Research Data (2020)

According to Hair, Black, and Babin (2010) adequate convergent validity was established by the factors as their loadings were all greater than the threshold of 0.350 for a large sample size. The nine-factor model explains 75.21 per cent of variance which was greater than the 50 per cent threshold. All factors demonstrated satisfactory discriminant validity as the correlation matrix indicates no correlation higher than 0.70 as shown in Table 4.19.

Table 4.19   Factor Correlation Matrix

Factor	ENP	RL	ORs	FP	CE	ECP	GP	FE	SP
ENP	1.000	-.084	.306	.187	.132	.046	.032	.146	-.079
RL	-.084	1.000	.330	.403	.391	.625	.406	.239	.429
ORs	.306	.330	1.000	.441	.331	.353	.461	.253	.196
FP	.187	.403	.441	1.000	.409	.520	.369	.148	.235
CE	.132	.391	.331	.409	1.000	.344	.244	-.039	.280
ECP	.046	.625	.353	.520	.344	1.000	.350	.347	.313
GP	.032	.406	.461	.369	.244	.350	1.000	.280	.256
FE	.146	.239	.253	.148	-.039	.347	.280	1.000	-.010
SP	-.079	.429	.196	.235	.280	.313	.256	-.010	1.000

Extraction Method: Maximum Likelihood.   Source: Research Data (2020)
 Rotation Method: Promax with Kaiser Normalization.

KEY
ENP-Environmental Performance
RL-Reverse logistics
ORs-Optimization of Routes
FP-Firm Performance
CE-Carbon Emission Measurement
ECP- Economic Performance
GP-Green Packaging
FE-Fuel Efficiency

SP-Social Performance

4.7 Confirmatory Factor Analysis

A single instrument was used in the process of data collection, that is, a survey, consequently, there was a need to test for common method bias to confirm if the outcomes of the measurement model were being affected by the method bias. To examine this, Harman's one-factor test was used. The result indicates that a single factor contributed 29.175% (that is, < 50%) of the total variance. This implies there was no sole dominant factor in the sample data. Therefore the model did not need to be adjusted to include the common method factor.

To assess construct reliability, unidimensionality and convergent validity the confirmatory measurement model was utilized in this study. Therefore, as suggested by Choi (2002), CFA was performed on variables as extracted from the EFA to check how well the manifest variables were linked to a set of latent variables. Choi (2010) opined that measurement models' goodness-of-fit determines how good the item is in examining the intended constructs. As recommended by Hu and Bentler (1999) the goodness-of-fit indices that assess the measurement model entail the χ^2/df, the CFI, the SRMR, the RMSEA and the PCLOSE.

4.7.1 Validity and Reliability of the Measurement Model

To assess the reliability and validity of the model, Gaskin and Lim (2016), "Master Validity Tool", AMOS Plugin was used. There should be no convergent validity issues if the latent factors are to be well explained by its observed variable. The following thresholds should be met to ensure the reliability and validity are attained with these parameters; Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV) and Average Shared Variance (ASV).

For reliability to be achieved, CR > 0.70. To achieve convergent reliability, CR > AVE and AVE > 0.50 (Hair, Black, & Babin, 2010).

For Discriminant validity to be achieved, MSV < AVE. For convergent validity, AVE was calculated. AVE greater than 0.50 was achieved for all the items meaning that convergent validity was achieved for all EFA extracted factors. To assess discriminant validity the square roots of AVE was compared (on the diagonal) to all inter-factor correlation as shown in Table 4.20. Adequate discriminant validity was exhibited by all factors since diagonal values were higher than the correlations. From the analysis, all the parameters had CR above the minimum threshold of 0.70 indicating sufficient composite validity. This showed that the variables retained during model modification process attained reliability and validity and therefore appropriate for use in the subsequent analysis.

Table 4.20   Composite Reliability, Convergent and Discriminant Validity Results of the CFA Model

	CR	AVE	MSV	MaxR(H)	FE	ENP	RL	Ort	FP	CE	ECP	GP	SP
FE	0.833	0.627	0.423	0.853	**0.792**								
ENP	0.949	0.757	0.610	0.955	0.348	**0.870**							
RL	0.909	0.668	0.590	0.916	0.190	-0.040	**0.817**						
ORt	0.908	0.711	0.471	0.914	0.475	0.160	0.596	**0.843**					
FP	0.773	0.541	0.501	0.880	0.569	0.057	0.476	0.548	**0.736**				
CE	0.923	0.751	0.590	0.977	0.161	-0.030	0.768	0.686	0.410	**0.867**			
ECP	0.890	0.669	0.610	0.901	0.330	0.781	0.028	0.395	0.248	0.125	**0.818**		
GP	0.883	0.717	0.477	0.917	0.425	0.103	0.691	0.531	0.358	0.588	0.162	**0.847**	
SP	0.857	0.670	0.501	0.924	0.650	0.299	0.403	0.511	0.708	0.324	0.338	0.245	**0.818**

References Significance of Correlations: † p < 0.100, * p < 0.050, ** p < 0.010, *** p < 0.001   Source: Research Data (2020)
Notes: The diagonal values show the square roots of AVE.
KEY
FE- Fuel Efficiency
ENP-Environmental Performance
RL- Reverse Logistics
ORt-Optimization of Routes
FP-Firm Performance
CE- Carbon Emission Measurement
ECP- Economic Performance
GP- Green Packaging
SP-Social Performance

4.7.2 Model Fit Evaluation

Measurement model goodness-of-fit indices are as follows: $\chi^2/df=2.981$, CFI=0.922, SRMR=0.054 and RMSEA=0.067. The normed chi-square test result was significant indicating that the model fitted well with the dataset. A CFI value close to 1 implies a good fit and index value above 0.90 is considered as sufficient (Gaskin & Lim, 2016). As shown in Table 4.21 the cut-off criteria in covariance structure analysis, these statistics are confirmation of a reasonably good fit of data. The measurement/CFA model is shown in Figure 4.2.

Figure 4.2   Measurement Model
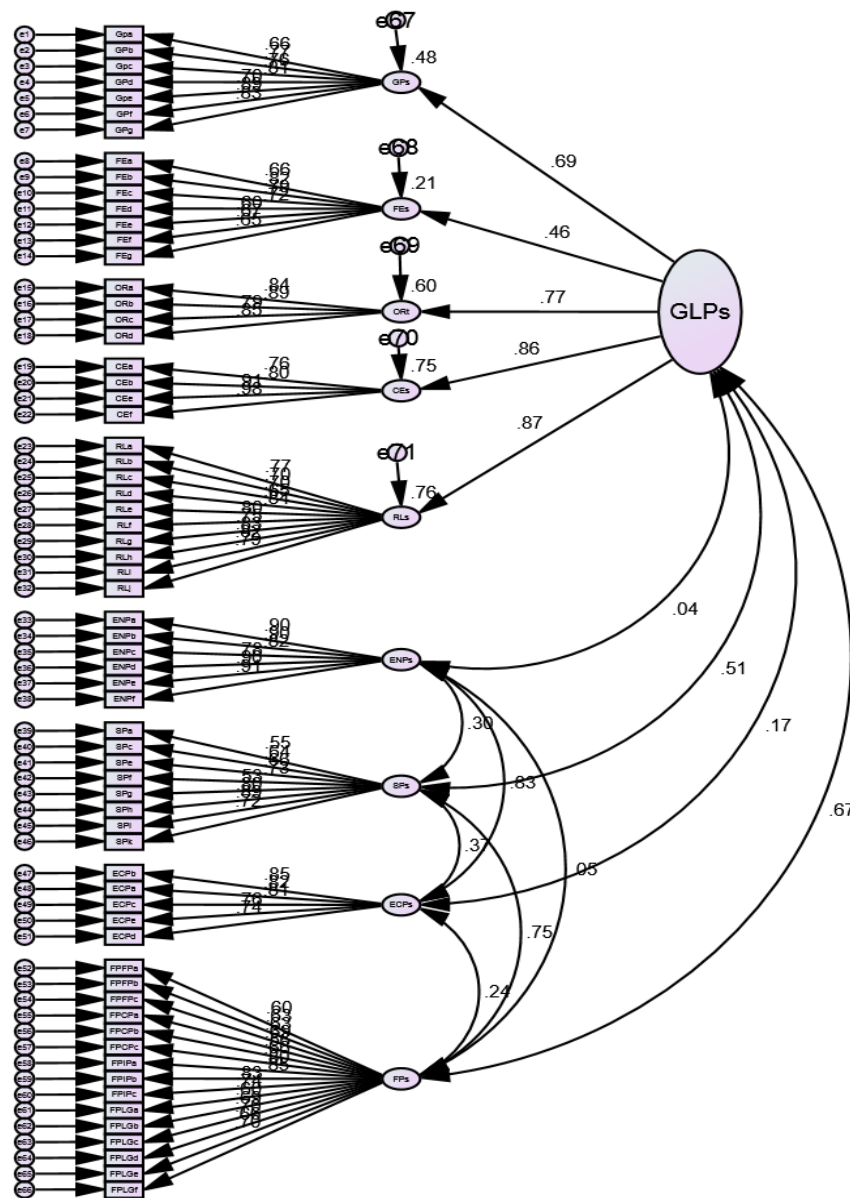
Source: Research Data (2020)

χ^2/d.f.=2.981, CFI=0.922, RMR=0.054 RMSEA=0.067

KEY

GP= Exogenous latent construct (Green Packaging)

FE= Exogenous latent construct (Fuel Efficiency)

RL= Exogenous latent construct (Reverse Logistics)

CE= Exogenous latent construct (Carbon Emission Measurement)

ORt= Exogenous latent construct (Optimization of Routes)

FP= Endogenous latent construct (Firm Performance)

ECP, ENP, SP= Mediating variables (Environmental Performance, Economic Performance and Social Performance)

Table 4.21   Cutoff Criteria for Fit Indexes in Covariance Structure Analysis

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

Source: Gaskin, J. & Lim, J. (2016), "Model Fit Measures", AMOS Plugin. Gaskination's StatWik

4.7.3 Unidimensionality

Unidimensionality indicates the presence of an individual factor underlying a group of items. To assess the components of the measurement model, direction, the magnitude, and the statistical importance of the parameter estimates between the indicator and latent variables were checked. Three conditions should be met for the unidimensionality of constructs, one, the parameter estimate's magnitude must be above 0.50. Two, the sign [that is, negative (-), positive (+)] of the parameter estimates must be in line with the theory and three, for every parameter estimate, the critical ratio (value) must be greater than 2.00 and should be statistically significant (Yaacob, 2008). The results of the standardized regression are indicated in Table 4.22.

Table 4.22   Measures and Test for Unidimensionality

	Measures		Standardized Factor Loading	C.R.	P
GPs	<---	GLPs	.695	N/A	N/A
Fes	<---	GLPs	.593	4.730	***
Ort	<---	GLPs	.771	7.087	***
CEs	<---	GLPs	.864	7.217	***
RLs	<---	GLPs	.874	7.439	***
Gpa	<---	GPs	.661	N/A	N/A
GPb	<---	GPs	.773	10.112	***
Gpc	<---	GPs	.764	9.965	***
GPd	<---	GPs	.808	10.165	***
Gpe	<---	GPs	.696	8.927	***
GPf	<---	GPs	.885	10.777	***
GPg	<---	GPs	.831	10.476	***
FEa	<---	FEs	.655	N/A	N/A
Feb	<---	FEs	.817	10.054	***
FEc	<---	FEs	.787	9.624	***
Fed	<---	FEs	.717	9.058	***
Fee	<---	FEs	.604	7.511	***
FEf	<---	FEs	.674	8.077	***
FEg	<---	FEs	.650	7.959	***
ORa	<---	ORt	.837	N/A	N/A
Orb	<---	ORt	.894	16.085	***
ORc	<---	ORt	.790	13.579	***
ORd	<---	ORt	.850	15.148	***
CEa	<---	CEs	.762	N/A	N/A
CEb	<---	CEs	.798	12.618	***
CEe	<---	CEs	.911	14.856	***
CEf	<---	CEs	.983	16.040	***
RLa	<---	RLs	.769	N/A	N/A
RLb	<---	RLs	.705	10.982	***
RLc	<---	RLs	.697	10.659	***
RLd	<---	RLs	.647	9.769	***
RLe	<---	RLs	.841	13.383	***
RLf	<---	RLs	.795	12.398	***
RLg	<---	RLs	.755	11.626	***
RLh	<---	RLs	.835	13.162	***
RLi	<---	RLs	.821	12.701	***
RLj	<---	RLs	.787	12.014	***
ENPa	<---	ENPs	.899	N/A	N/A
ENPb	<---	ENPs	.900	20.685	***
ENPc	<---	ENPs	.825	16.723	***
ENPd	<---	ENPs	.777	14.876	***
ENPe	<---	ENPs	.900	20.388	***

	Measures		Standardized Factor Loading	C.R.	P
ENPf	<---	ENPs	.910	20.995	***
Spa	<---	SPs	.552	N/A	N/A
SPc	<---	SPs	.643	7.189	***
SPe	<---	SPs	.660	7.290	***
SPf	<---	SPs	.728	7.758	***
SPg	<---	SPs	.532	6.307	***
SPh	<---	SPs	.796	8.198	***
SPi	<---	SPs	.892	8.644	***
SPk	<---	SPs	.715	7.770	***
ECPb	<---	ECPs	.848	N/A	N/A
ECPa	<---	ECPs	.816	14.341	***
ECPc	<---	ECPs	.810	14.486	***
ECPe	<---	ECPs	.759	12.824	***
ECPd	<---	ECPs	.740	12.039	***
FPFPa	<---	FPs	.597	N/A	N/A
FPFPb	<---	FPs	.630	7.926	***
FPFPc	<---	FPs	.628	7.880	***
FPCPa	<---	FPs	.691	8.260	***
FPCPb	<---	FPs	.564	7.057	***
FPCPc	<---	FPs	.656	7.969	***
FPIPa	<---	FPs	.797	8.967	***
FPIPb	<---	FPs	.848	9.430	***
FPIPc	<---	FPs	.827	9.198	***
FPLGa	<---	FPs	.742	8.643	***
FPLGb	<---	FPs	.604	7.435	***
FPLGc	<---	FPs	.692	8.224	***
FPLGd	<---	FPs	.703	8.341	***
FPLGe	<---	FPs	.664	7.987	***
FPLGf	<---	FPs	.697	8.171	***

Source: Research Data (2020)

As indicated in Table 4.22 all the parameter estimates magnitudes were positive and above the threshold value of 0.50 and therefore consistent with literature and theory. They all had a critical ratio above 2.00, therefore supporting the presence of unidimensionality of the constructs.

4.8 Structural Equation Modeling Analysis, Multivariate Assumption Testing and Control Variables

Figure 4.2 indicates the research model that was assessed using SEM. To perform SEM, Hair et al. (2010) suggested a two-stage process, where CFA is tested before the structural model. The multivariate analysis assumptions should be investigated first before SEM analysis is conducted (Lee et al, 2010). A minimum sample size ranging from 100 to 200 has been suggested for covariance-based SEM analysis (Forza & Filippini, 1998). This study's sample size (N = 213) can be considered adequate as it is within the acceptable range.

The most frequently used diagnostic statistics for detecting outliers in SEM is Cook's distance. It is used commonly, ever since American statistician Cook (1977) introduced it. Data points with large Cook's distance are the ones that need to be scrutinised further since they could either be containing important information or be contaminations which should be gotten rid of. None of the data value is above the threshold of 1 and therefore there are no influential data points.

Multicollinearity was diagnosed using VIF and its reciprocal, the tolerance. As indicated in Table 4.23, none of the factors was found to register VIF above 3 (or tolerance levels higher than 0.33). This showed that the likelihood of data collinearity was absent. These general assumptions of the multivariate model show that there were no significant statistical violations. Generally, it can be summarized that the univariate normality test is satisfactory. Lastly, to reduce the danger of confounding variables, which would lead to spurious relationships, three variables related to the demographic of logistics firms were controlled in the structural model. They were

firm ownership status, size of the firm and possession of an EMS certification by the firm.

Table 4.23   VIF Values for Predictor Variables in the Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.714	.172		4.146	.000		
Fuel Efficiency	-.244	.049	-.215	-4.975	.000	.711	1.406
Optimization of Routes	.476	.053	.506	9.000	.000	.418	2.391
Green Packaging	.206	.045	.204	4.561	.000	.664	1.507
Carbon Emission	.264	.038	.359	6.975	.000	.501	1.998

a. Dependent Variable: Reverse Logistics

Source: Research Data (2020)

4.9 Hypothesis Testing

The main issue in scrutinizing the theoretical framework is whether it conflicts the reality as seen in the sample, that is, how well the theoretical model fits the dataset (Zhang, 2000). Several indicators are computed and AMOS version 23 can be used to examine the goodness of fit of the model. As recommended by Hair et al. (2010) there are five measures to determine the goodness-of-fit. These include chi-square statistics, the CFI, the SRMR, the RMSEA and PCLOSE. The model fit of the overall structure model was verified before examining each hypothesis. The results in Table 4.24 indicate that the model fit indices were χ^2/d.f. =1.893, CFI = 0.997, SRMR = 0.015, RMSEA = 0.065, PCLOSE = 0.249. According to the guidelines of Hu and Bentler (1999), these values were highly sufficient.

Table 4.24   Model Fit Indices for the Structural Model

Model fit indices	Estimate	Threshold	Interpretation
CMIN/DF	1.893	Between 1 and 3	Excellent
CFI	0.997	>0.95	Excellent
SRMR	0.015	<0.08	Excellent

Model fit indices	Estimate	Threshold	Interpretation
RMSEA	0.065	<0.06	Acceptable
PCLOSE	0.249	>0.05	Excellent

SEM procedure tests the models, where causal relationships are hypothesized to exist between latent variables. This section presents the results of path coefficients in the research model and draws a picture of the overall data analysis results. As can be seen from Figure 4.12, green logistics practices play a different role in the decision-making process by placing different impact on economic, environmental and social performance which further lead to firm performance. The R^2 values range from 0.206 to 0.839. In AMOS analysis, examining the R^2 scores and the structural paths assesses the explanatory power of a structural model. In this study, the model accounts for 20.6 to 83.9 per cent of the variances (R^2) as indicated in Figure 4.12.

4.9.1 Green Logistics Practices and Firm Performance

H_1: *Green logistics practices by an organization have a significant effect on the firm's performance.*

Hypothesis 1 predicted a positive influence of green logistics practices on firm performance. CB-SEM analysis was conducted to test the hypothesis. To get the combined effect of the five green logistics practices (green packaging, fuel efficiency, optimization of routes, carbon emission measurement and reverse logistics) on firm performance, a composite factor of the five latent variables formed green logistics practices variable as a second-order factor.

An evaluation of the relevance of the path coefficient indicates that green logistics practices had a significant positive effect on firm performance ($\beta=0.65$, $p<0.001$) with a t–value of 6.191 as shown in Figure 4.3 and Table 4.25. Sufficient model fit indices

were obtained, that is, χ^2/d.f. =1.912, CFI =0.989, SRMR = 0.036, RMSEA = 0.066, PCLOSE = 0.211. The results from testing this relationship are presented in Table 4.25. The endogenous latent construct; firm performance has a coefficient of determination (R^2) of 0.417, meaning that, the latent construct green logistics practices explain 41.7% of the variance in firm performance. Hypothesis H_1 is supported as it relates to the influence of green logistics practices on firm performance.

Figure 4.3   Green Logistics Practices and Firm Performance
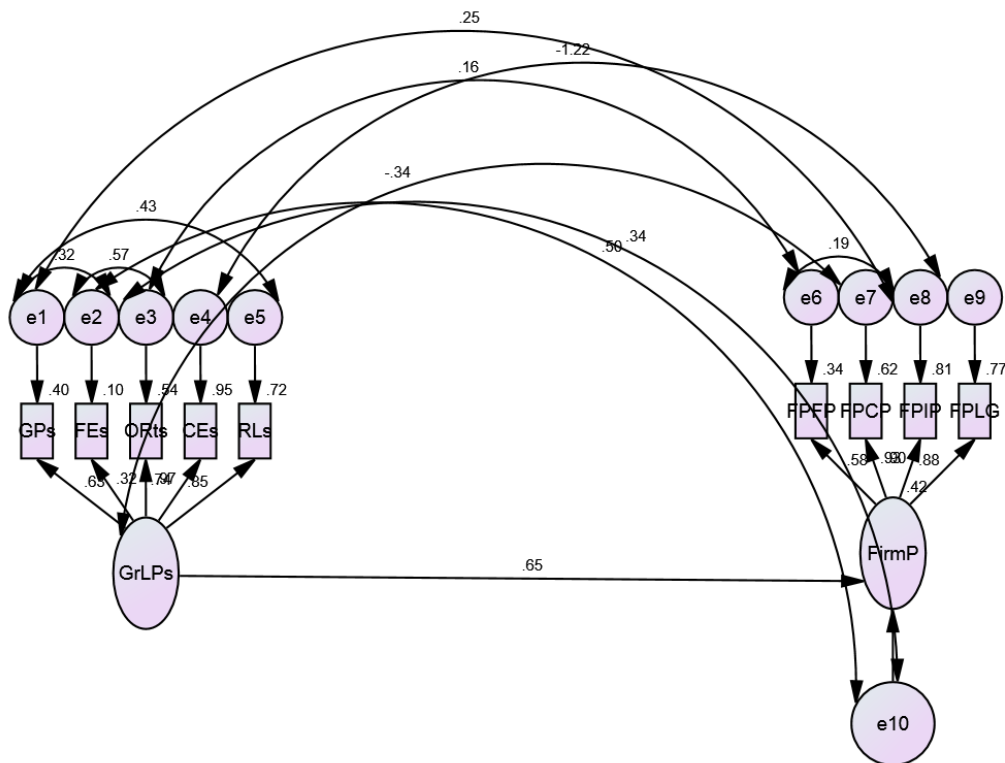
Source: Research Data (2020)

Key:

GPs= Exogenous latent construct (Green Packaging Practices)

FEs= Exogenous latent construct (Fuel Efficiency)

ORts= Exogenous latent construct (Optimization of Routes)

CEs= Exogenous latent construct (Carbon Emission)

RLs= Exogenous latent construct (Reverse Logistics)

GrLPs= Exogenous second-order latent construct (Green Logistics Practices)

FirmP= Endogenous latent construct (Firm Performance)

FPFP-Firm Performance Financial Perspective

FPCP- Firm Performance Customer Perspective

FPIP- Firm Performance Internal Processes

FPLG-Firm Performance Learning and Growth

Table 4.25   Hypothesis Testing Result for Green Logistics Practices and Firm Performance

Endogenous Variable	Exogenous Variable	Standardized coefficients	Standard Error (S.E.)	Critical Ratio(C.R.) /T statistics	P-Value	Hypothesis testing result
Firm Performance R^2=0.417	Green Logistics Practices	0.65	.109	6.191	***	Significant

4.9.2 Green Logistics Practices, Firm's Characteristics and Firm Performance

H_2: *Firm's characteristics moderate the relationship between green logistics practices implementation and firm performance.*

Here, the independent variable was found to affect the response variable, but this influence is not the same at altered degrees of the moderator. Standardized values of ownership status, size of the firm and possession of an EMS certificate are incorporated in the model as moderating variables. An interaction term on green logistics practices and ownership was incorporated as shown in Figure 4.4. Model fit indices obtained were sufficient, that is, $\chi 2$/d.f. = 1.978, CFI = 0.998, SRMR = 0.068, RMSEA = 0.068, PCLOSE = 0.128. The connection between green logistics practices and performance of the firm were plotted based on the ownership status. As shown in Table 4.26, the results indicated that the interaction term for green logistics practices and ownership status (β = -.070, p = .823) was insignificantly related to firm performance.

The endogenous latent construct; firm performance has a coefficient of determination (R^2) of 0.416, meaning that, the latent construct green logistics practices, interaction term on green logistics practices and ownership and standardized ownership construct explain 41.6% of the variance in firm performance. This signifies a slight reduction in variance explained compared to when the latent variables, interaction term on green

logistics practices and ownership and standardized ownership construct are excluded

from the model (R^2 declined from 41.7% to 41.6%).

Figure 4.4   Path Model for Two-way interaction effect of Ownership and Green Logistics Practices on Firm Performance
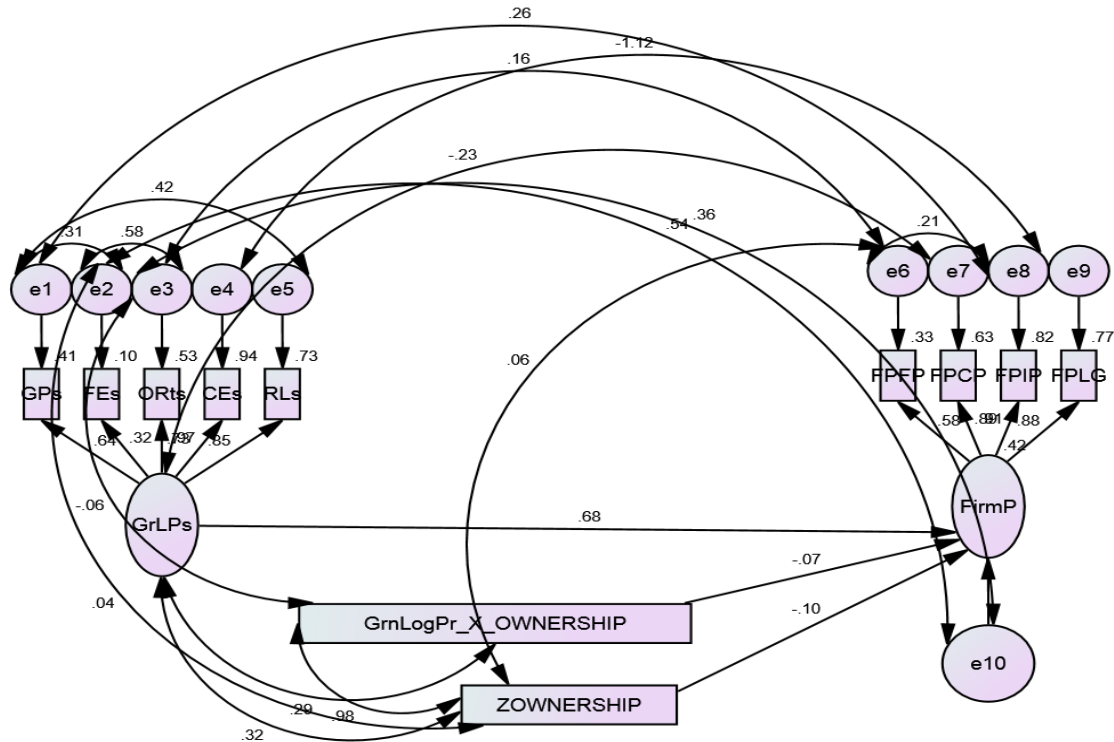
Source: Research Data (2020)

Key:

GPs= Exogenous latent construct (Green Packaging Practices)

FEs= Exogenous latent construct (Fuel Efficiency)

ORts= Exogenous latent construct (Optimization of Routes)

CEs= Exogenous latent construct (Carbon Emission)

RLs= Exogenous latent construct (Reverse Logistics)

ZOwnership = Moderating variable (Firm characteristics- The ownership status of the firm)

GrLPs= Exogenous second-order latent construct (Green Logistics Practices)

FirmP= Endogenous latent construct (Firm Performance)

FPFP-Firm Performance Financial Perspective

FPCP- Firm Performance Customer Perspective

FPIP- Firm Performance Internal Processes

FPLG-Firm Performance Learning and Growth

Table 4.26   Hypothesis Testing Result for Green Logistics Practices, Ownership status and Firm Performance

Dependent Variable.	Independent Variable	Standardized coefficients	Std. Error (S.E.)	Critical Ratio(C.R.) /T statistics	P-Value	Hypothesis testing Result
Firm Performance	GLPs	.677	.113	6.227	***	Significant
R^2=0.416	ZOwnership	-.099	.169	-.315	.753	Non-Significant
	GLPs_X_Ownership	-.070	.051	-.224	.823	Non-Significant

Source: Research Data (2020)

Another interaction term on green logistics practices and size were included in the model as shown in Figure 4.5. The model fit indices established were acceptable; χ^2/d.f. = 1.585, CFI = 0.994, SRMR = 0.041, RMSEA = 0.053 and PCLOSE = 0.415. The link between green logistics practices and performance of the firm were plotted based on the size of the firm. As shown in Table 4.27 the results indicated that the interaction term for green logistics practices and firm size (β = -1.264, $p < 0.001$) was significantly related to firm performance. Larger firms had a lower level of implementation of green logistics practices than smaller firms as indicated by the steeper slope of the low size line in Figure 4.6. Therefore, firm size dampens the positive link between green logistics practices and firm performance.

Firm performance (endogenous latent construct) has a coefficient of determination (R^2) of 0.491, meaning that, the latent construct green logistics practices, interaction term on green logistics practices and size and standardized size construct explain 49.1% of the variance in firm performance. This indicates a great improvement in variance explained compared to when the latent variables, interaction term on green logistics practices and size and standardized size construct are excluded from the model (R^2 improved from 41.7% to 49.1%).

Figure 4.5   Path Model for Two-way interaction effect of Size and Green Logistics Practices on Firm Performance
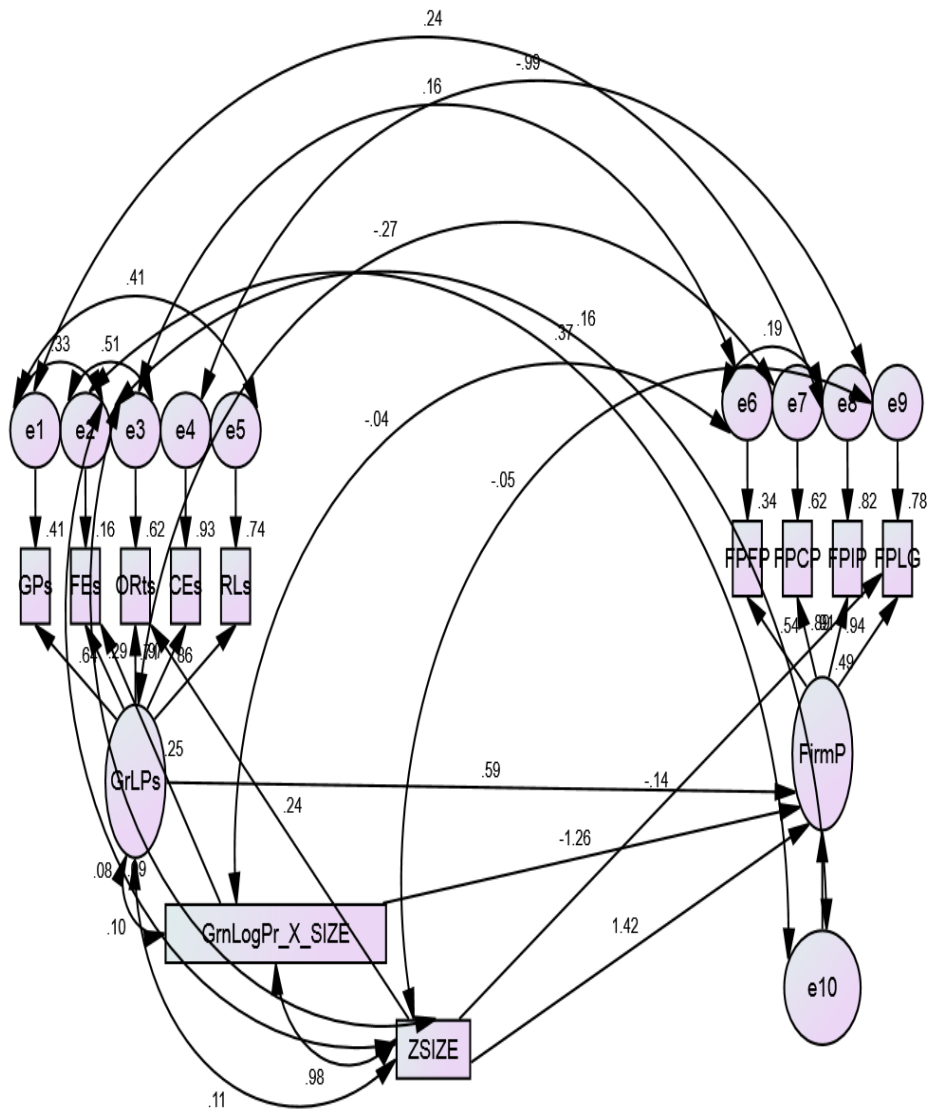
Source: Research Data (2020)

Key:

GPs= Exogenous latent construct (Green Packaging Practices)

FEs= Exogenous latent construct (Fuel Efficiency)

ORts= Exogenous latent construct (Optimization of Routes)

CEs= Exogenous latent construct (Carbon Emission)

RLs= Exogenous latent construct (Reverse Logistics)

ZSize = Moderating variable (Firm characteristics- The size of the firm)

GrLPs= Exogenous second-order latent construct (Green Logistics Practices)

FirmP= Endogenous latent construct (Firm Performance)

FPFP-Firm Performance Financial Perspective

FPCP- Firm Performance Customer Perspective

FPIP- Firm Performance Internal Processes

FPLG-Firm Performance Learning and Growth

Table 4.27   Hypothesis Testing Result for Green Logistics Practices, Size and Firm Performance

Dependent Variable.	Independent Variable	Standardized coefficients	Std. Error (S.E.)	Critical Ratio(C.R.) /T statistics	P-Value	Hypothesis testing Result
Firm Performance	GLPs	.593	.096	5.909	***	Significant
$R^2 = 0.491$	ZSize	1.420	.147	4.710	***	Significant
	GLPs_X_Size	-1.264	.043	-4.311	***	Significant

Source: Research Data (2020)

Figure 4.6   Two-way Interaction Effect of Firm Size and Green Logistics Practices on Firm Performance

Source: Research Data (2020)

Lastly, interaction terms on green logistics practices and the possession of an EMS certificate were included in the model as shown in Figure 4.7. Majority of the established model fit indices were acceptable; χ^2/d.f. =1.852, CFI =0.990, SRMR = 0.048, RMSEA = 0.063, PCLOSE = 0.208. The link between green logistics practices and firm performance were plotted based on possession of an EMS certificate. As shown in Table 4.28 the results indicated that the interaction term for green logistics practices and possession of an EMS certificate (β = -.638, p = .004) was significantly related to firm performance. Firms with an EMS certificate had a lower level of

implementation of green logistics practices than those without an EMS certificate as shown by the steeper slope of the low EMS line in Figure 4.8. Therefore, possession of an EMS certificate by a firm dampens the positive link between green logistics practices and firm performance.

Firm performance construct has a coefficient of determination (R^2) of 0.429, meaning that, the latent construct green logistics practices, interaction term on green logistics practices and EMS and standardized EMS construct explain 42.9% of the variance in firm performance. This indicates an improvement in variance explained compared to when the latent variables, interaction term on green logistics practices and EMS and standardized EMS construct are excluded from the model (R^2 improved from 41.7% to 42.9%).

Figure 4.7   Path Model for Two-way Interaction Effect of EMS and Green Logistics Practices on Firm Performance
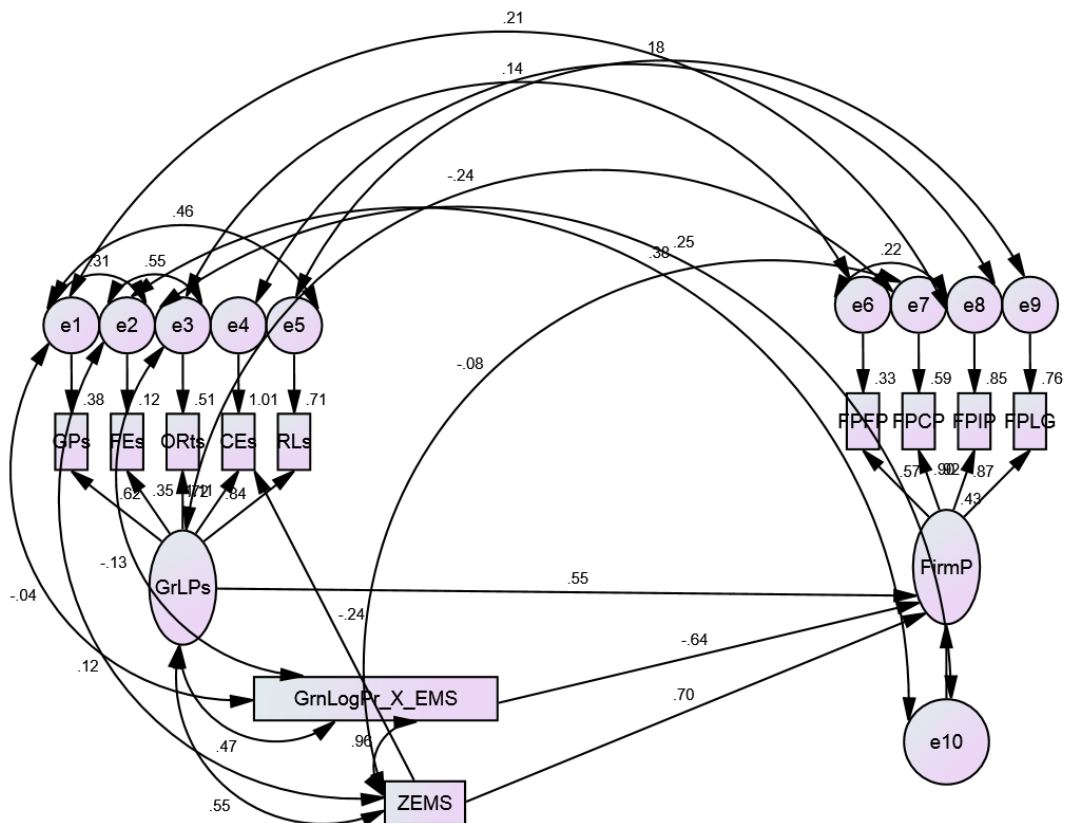
Source: Research Data (2020)

GPs= Exogenous latent construct (Green Packaging Practices)
FEs= Exogenous latent construct (Fuel Efficiency)
ORts= Exogenous latent construct (Optimization of Routes)
CEs= Exogenous latent construct (Carbon Emission)
RLs= Exogenous latent construct (Reverse Logistics)
ZEMS = Moderating variable (Firm characteristics- The possession of an EMS certification by a firm)
GrLPs= Exogenous second-order latent construct (Green Logistics Practices)
FirmP= Endogenous latent construct (Firm Performance)
FPFP-Firm Performance Financial Perspective
FPCP- Firm Performance Customer Perspective
FPIP- Firm Performance Internal Processes
FPLG-Firm Performance Learning and Growth

Table 4.28   Hypothesis Testing Result for Green Logistics Practices, EMS status and Firm Performance

Dependent Variable.	Independent Variable	Standardized coefficients	Std. Error (S.E.)	Critical Ratio(C.R.) /T statistics	P-Value	Hypothesis testing Result
Firm Performance	GLPs	.546	.106	5.464	***	Significant
R^2=0.429	ZEMS	.699	.124	3.009	.003	Significant
	GLPs_X_EMS	-.638	.042	-2.880	.004	Significant

Source: Research Data (2020)

Figure 4.8   Two-way Interaction Effect of Possession of an EMS certificate and Green Logistics Practices on Firm Performance
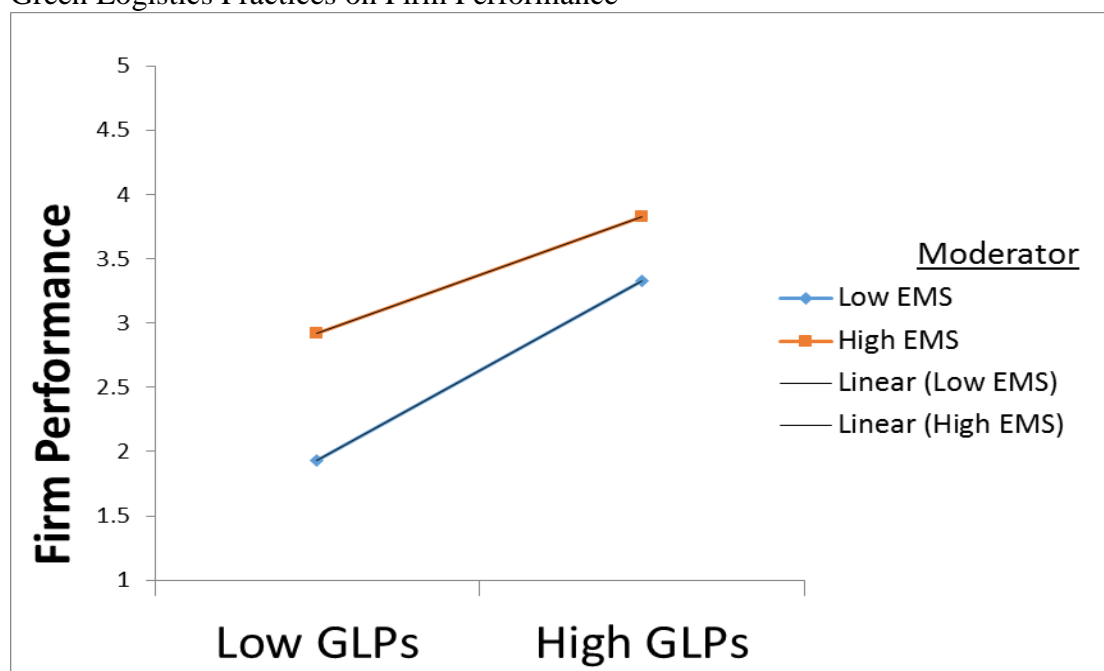
Source: Research Data (2020)

4.9.3 Green Logistics Practices, Environmental Performance and Firm Performance

H₃: *The relationship between green logistics practices and firm's performance is mediated by environmental performance.*

The test of mediation was done by performing 2,000 bootstrap samples at a confidence interval (CI) of 95 per cent on the indirect effects (Cheung & Lau, 2008). To examine the existence of a mediating influence of environmental performance on green logistics practices and firm performance, AMOS Estimand, established by Gaskin (2016b) was employed. Hypothesis three (H_3), predicted that environmental performance would mediate the link between green logistics practices and firm performance. The five practices were combined to form green logistics practices as one variable and the presence of a mediating effect of environmental performance on the link between green logistics practices and firm performance was tested as shown in Figure 4.9. The model fit indices obtained were sufficient, that is, χ^2/d.f. =1.983, CFI = 0.987, SRMR = 0.042, RMSEA = 0.068, PCLOSE = 0.162.

The coefficient of determination (R^2) for firm performance construct was 0.416, meaning that, the latent construct green logistics practices and environmental performance construct explain 41.6% of the variance in firm performance. This indicates a small reduction in variance explained compared to when the latent variable, environmental performance is excluded from the model (R^2 declined from 41.7% to 41.6%). Environmental performance coefficient of determination was 0.00, which is considered very weak, while the R^2 value for the firm performance of 0.416 is considered weak (Moore, Notz, & Flinger, 2013).

As earlier indicated, the link between green logistics practices and firm performance was positive and significant ($\beta = 0.646$, $p < 0.001$) without mediators. After including environmental performance as a mediator, this relationship did not change. Meanwhile, tests of hypotheses revealed that green logistics practices implementation was insignificantly related to environmental performance ($\beta = 0.01$, p-value = 0.627). The findings also presented that environmental performance ($\beta = 0.000$, p-value = 0.973) had a statistically insignificant relationship with firm performance. The bootstrapping results revealed that environmental performance does not mediate the positive link between green logistics practices and firm performance ($\beta = .000$, p = .937) at 0.05 level of significance. Hypothesis 3 is, therefore, not supported. The bootstrapping results are presented in Table 4.29.

Table 4.29   Mediation of Environmental Performance on Green Logistics Practices and Firm Performance

Dependent Variable.	Parameter	Estimate	Lower	Upper	P-Value	Hypothesis testing result
Firm Performance R^2=0.416	Green logistics practices X Environmental performance	.000	-.007	.011	.937	Non-Significant

Source: Research Data (2020)

Figure 4.9   Mediation of Environmental Performance on Green Logistics Practices and Firm Performance
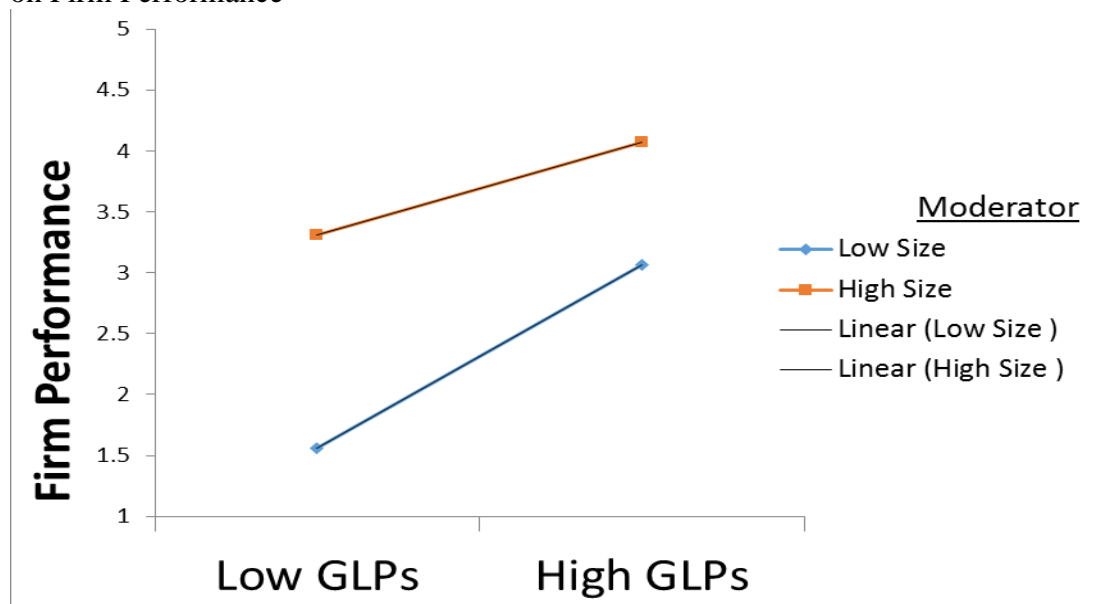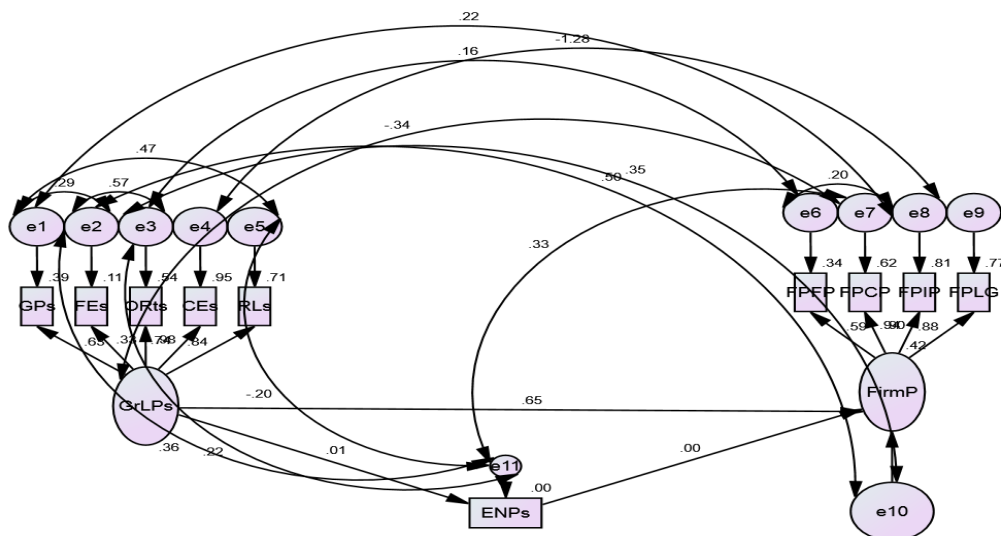

Source: Research Data (2020)

KEY
GPs= Exogenous latent construct (Green Packaging Practices)
FEs= Exogenous latent construct (Fuel Efficiency)
ORts= Exogenous latent construct (Optimization of Routes)
CEs= Exogenous latent construct (Carbon Emission)
RLs= Exogenous latent construct (Reverse Logistics)
GrLPs= Exogenous second-order latent construct (Green Logistics Practices)
ENPs = Mediating variables (Environmental Performance)
FirmP= Endogenous latent construct (Firm Performance)
FPFP-Firm Performance Financial Perspective
FPCP- Firm Performance Customer Perspective
FPIP- Firm Performance Internal Processes
FPLG-Firm Performance Learning and Growth

4.9.4 Green Logistics Practices, Economic Performance and Firm Performance

H_4: The relationship between green logistics practices and firm's performance is mediated by economic performance.

To investigate the mediating influence of economic performance on the link between green logistics practices and firm performance, Gaskin's AMOS Estimand was used. Hypothesis four (H_4), stated that economic performance mediates the connection between green logistics and firm performance. As demonstrated in Figure 4.10 the presence of mediating influence of economic performance on the connection between green logistics practices and firm performance was checked. Sufficient model fit indices were obtained, that is, χ^2/d.f. = 1.762, CFI = 0.990, SRMR = 0.037, RMSEA = 0.060, PCLOSE = 0.285.

The endogenous latent construct; firm performance has a coefficient of determination (R^2) of 0.447, meaning that, the latent construct green logistics practices and economic performance construct explain 44.7% of the variance in firm performance. This indicates a great improvement in variance explained compared to when the latent variable, economic performance is excluded from the model (R^2 improved from 41.7% to 44.7%). Economic performance coefficient of determination was 0.016,

which is considered very weak while that of the firm performance of 0.447 is considered weak (Moore et al., 2013).

Initially, without any mediators, there was a positive significant link between green logistics practices and firm performance (β = 0.646, p < 0.001). Economic performance was included in the model as a mediator, and a statistically significant path coefficient of (β = 0.625, p < 0.001) was established for the direct effect. Meanwhile, tests of hypotheses revealed that green logistics practices implementation was significantly related to economic performance (β = 0.133, p < 0.001). The findings also presented that economic performance (β = 0.152, p < 0.001) had a statistically significant relationship with firm performance. The bootstrapping results revealed that economic performance partially mediates the positive connection between green logistics practices and firm performance (β = .020, p = .039) at 0.05 significance level. Hypothesis 4 is supported as per the bootstrapping results presented in Table 4.30.

Table 4.30   Mediation of Economic Performance on Green Logistics Practices and Firm Performance

Dependent Variable.	Parameter	Estimate	Lower	Upper	P-Value	Hypothesis testing result
Firm Performance R^2=0.447	Green logistics practices X Economic performance	.020	.002	.055	.039	Significant

Source: Research Data (2020)

Figure 4.10   Mediation of Economic Performance on Green Logistics Practices and Firm Performance

Source: Research Data (2020)

GPs= Exogenous latent construct (Green Packaging Practices)
FEs= Exogenous latent construct (Fuel Efficiency)
ORts= Exogenous latent construct (Optimization of Routes)
CEs= Exogenous latent construct (Carbon Emission)
RLs= Exogenous latent construct (Reverse Logistics)
GrLPs= Exogenous second-order latent construct (Green Logistics Practices)
ECPs = Mediating variables (Economic Performance)
FirmP= Endogenous latent construct (Firm Performance)
FPFP-Firm Performance Financial Perspective
FPCP- Firm Performance Customer Perspective
FPIP- Firm Performance Internal Processes
FPLG-Firm Performance Learning and Growth

4.9.5 Green Logistics Practices, Social Performance and Firm Performance

H₅: The relationship between green logistics practices and firm performance is mediated by social performance.

To investigate the mediating effect of social performance on the link between green logistics practices and firm performance the researcher utilized Gaskin's AMOS Estimand. Hypothesis five (H₅), stated that social performance mediates the association between green logistics practices and firm performance. As illustrated in Figure 4.11 the test of the presence of a mediating effect of social performance on the link between green logistics practices and firm performance. Model fit measure

obtained were deemed sufficient, χ^2/d.f. =1.629, CFI = 0.992, SRMR = 0.038, RMSEA = 0.054, PCLOSE = 0.379.

The coefficient of determination (R^2) for firm performance construct was 0.758, meaning that, the latent construct green logistics practices and environmental performance construct explain 75.8% of the variance in firm performance. This indicates a very great improvement in variance explained compared to when the latent variable, social performance is excluded from the model (R^2 improved from 41.7% to 75.8%). Social performance coefficient of determination was 0.249 and according to Moore et al., (2013), this can be considered as weak, while the R^2 value for the firm performance of 0.758 is considered strong.

Originally, without any mediators, there was a positive significant link between green logistics practices and firm performance (β = 0.646, p < 0.001). Then, social performance was included in the model as a mediator, and a statistically significant path coefficient of (β = 0.313, p < 0.001) was established for the direct effect. In the meantime, tests of hypotheses revealed that green logistics practices implementation was significantly related to social performance (β = 0.502, p < 0.001). The findings also presented that social performance (β = 0.682, p < 0.001) had a statistically significant relationship with firm performance. The results from bootstrapping showed that social performance partially mediates the positive link between green logistics practices and firm performance (β = .361, p = .007), at 0.05 significance level. Hypothesis 5 is, therefore, supported. Table 4.31 shows the bootstrapping results.

Table 4.31   Mediation of Social Performance on Green Logistics Practices and Firm Performance

Dependent Variable.	Parameter	Estimate	Lower	Upper	P-Value	Hypothesis testing result
Firm Performance R^2=0.758	Green logistics practices X Social performance	.361	.259	.503	.007	Significant

Figure 4.11   Mediation of Social Performance on Green Logistics Practices and Firm Performance
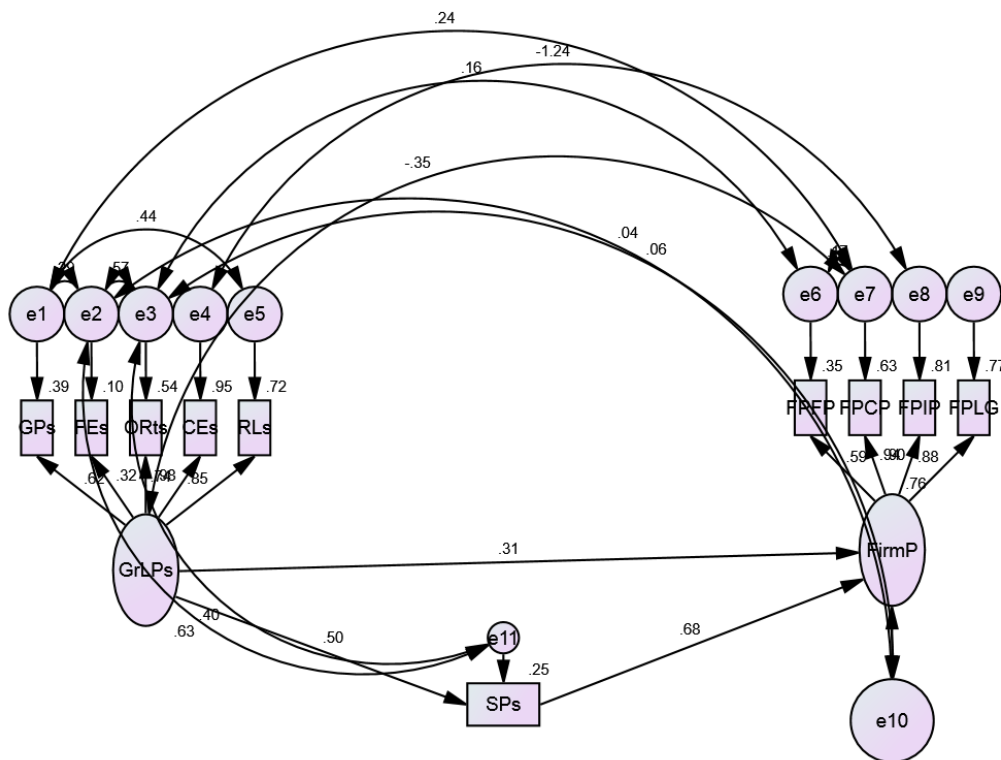
GPs= Exogenous latent construct (Green Packaging Practices)
FEs= Exogenous latent construct (Fuel Efficiency)
ORts= Exogenous latent construct (Optimization of Routes)
CEs= Exogenous latent construct (Carbon Emission)
RLs= Exogenous latent construct (Reverse Logistics)
GrLPs= Exogenous second-order latent construct (Green Logistics Practices)
ECPs = Mediating variables (Economic Performance)
FirmP= Endogenous latent construct (Firm Performance)
FPFP-Firm Performance Financial Perspective
FPCP- Firm Performance Customer Perspective
FPIP- Firm Performance Internal Processes
FPLG-Firm Performance Learning and Growth

4.9.6 Green Logistics Practices, Firm Characteristics, Environmental Performance, Economic Performance, Social Performance and Firm Performance

H_6: The relationship between green logistics practices, firm characteristics, environmental performance, economic performance and social performance with firm performance is significant.

In hypothesis testing, the validity of the hypothesized path is verified by evaluating the statistical significance of each structural parameter value. The structural model without the influence of the firm characteristics had the variance explained (R^2) by environmental, economic, social and firm performance as 1.3, 6.4, 40.6 and 81.0 per cent, respectively. As shown in Table 4.30 after inclusion of the firm characteristics into the structural model as indicated in Figure 4.11, the variance explained (R^2) by environmental, economic, social and firm performance as 20.6, 31.8, 49.3 and 83.9 per cent, respectively.

The R^2 of 20.6 per cent for environmental performance means that green logistics practices, EMS and the interaction term of green logistics practices and firm size account for 20.6% of the variance in environmental performance. 31.8% of the variance in economic performance can be explained by green logistics practices, possession of an EMS certification and firm size. Besides, green logistics practices, possession of an EMS certification and environmental performance account for 49.3% of the variance in social performance. Green logistics practices, economic performance, environmental performance, social performance, ownership status, firm size, EMS, the interaction term of green logistics practices and ownership, the interaction term of green logistics practices and firm size, and the interaction term of

green logistics practices and EMS account for 83.9% of the variance in firm performance.

The direct effect results according to Figure 4.12 and Table 4.32, indicated that green logistics practices (β = .227, p = 0.001) and the interaction term of green logistics practices and firm size (β = .343, p < 0.001) were established to be positive and significantly related to environmental performance. Possession of EMS certification (β = -.402, p < 0.001) was established to have a significant negative link to environmental performance. Green logistics practices (β = .359, p < 0.001) and firm size (β = .402, p < 0.001) were established to have a significant positive link to economic performance, while this relationship was negative and significant for EMS (β = -.458, p < 0.001). There was a significant positive link between social performance and green logistics practices (β = .517, p < 0.001), EMS (β = .175, p = 0.003) and environmental performance (β = .303, p < 0.001).

Green logistics practices (β = .247, p < 0.001), economic performance (β = .387, p < 0.001), social performance (β = .708, p < 0.001), firm size (β = .443, p = 0.004) and the interaction term of green logistics practices and ownership (β = .467, p = 0.030) were found to be all significantly and positively related to firm performance. The interaction term of green logistics practices and EMS (β = .151, p = 0.346) was established to have a positive but insignificant link to firm performance. However, enviromental performance (β = -.497, p < 0.001), ownership (β = -.572, p = .006) and interaction term of green logistics practices and firm size (β = -.531, p < 0.001) were confirmed to have a significant negative connection to firm performance. Possession of an EMS certification (β = -.057, p = .732) was established to have a negative non-significant link to firm performance.

The influence of green logistics practices on firm performance was assessed in hypothesis one and about 41.7% of the variation in firm performance was explained by variation in green logistics practices. In the second hypothesis, firm characteristics (ownership status, size of the firm and possession of an EMS certificate) were incorporated in the model as moderating variables and the variance explained (R^2) ranged from 41.6, 49.1, 42.9%, respectively.

The influence of environmental, economic, and social performance on the link between green logistics practices and firm performance were evaluated in hypothesis three, four and five respectively. The results indicated that green logistics practices and (environmental, economic, and social) performance constructs explain 41.6, 44.7 and 75.8 percent of the variance in firm performance, respectively. The joint effect of green logistics practices, firm characteristics, environmental performance, economic performance, and social performance evaluated in hypothesis six indicated that 83.9% of the variation in firm performance was explained in the model. The joint effect as evidenced in the model in Figure 4.12 was greater than the individual effects of green logistics practices, firm characteristics, environmental performance, economic performance, and social performance, thus hypothesis six was supported.

Table 4.32　Hypothesis Testing Result for Green Logistics Practices, Firm Characteristics, Environmental Performance, Economic Performance, Social Performance and Firm Performance

Dependent Variable	Independent Variable	Standardized coefficients	Standard Error (S.E.)	Critical Ratio (C.R.) /T statistics	P-Value	Hypothesis Testing result
Environmental Performance $R^2 = .206$	Green Logistics Practices	.227	.110	3.194	.001	Significant
	EMS	-.402	.082	-5.650	***	Significant
	GrnLogPr_X_SIZE	.343	.022	5.518	***	Significant
Economic Performance $R^2 = .318$	Green Logistics Practices	.359	.100	5.452	***	Significant
	EMS	-.458	.075	-6.960	***	Significant
	Size	.402	.067	6.777	***	Significant
Social Performance $R^2 = .493$	Green Logistics Practices	.517	.052	8.956	***	Significant
	EMS	.175	.040	2.988	.003	Significant
	Environmental Performance	.303	.030	5.919	***	Significant
Firm Performance $R^2=0.839$	Green Logistics Practices	.247	.032	5.720	***	Significant
	Environmental Performance	-.497	.027	-8.613	***	Significant
	Economic Performance	.387	.031	6.108	***	Significant
	Social Performance	.708	.032	17.897	***	Significant
	Ownership	-.572	.114	-2.754	.006	Significant
	Size	.443	.083	2.917	.004	Significant

Dependent Variable	Independent Variable	Standardized coefficients	Standard Error (S.E.)	Critical Ratio (C.R.) /T statistics	P-Value	Hypothesis Testing result
	EMS	-.057	.092	-.342	.732	Not Significant
	GLPSs_X_OWNERSHIP	.467	.036	2.166	.030	Significant
	GLPSs_X_SIZE	-.531	.025	-3.449	***	Significant
	GLPSs_X_EMS	.151	.032	.943	.346	Not Significant

χ^2/d.f. =1.893, CFI =0.997, SRMR = 0.015, RMSEA = 0.065, PCLOSE = 0.249   Source: Research Data (2020)

*** $p<0.001$

Figure 4.12: Hypothesis Testing Result for Green Logistics Practices, Firm Characteristics, Environmental Performance, Economic Performance, Social Performance and Firm Performance
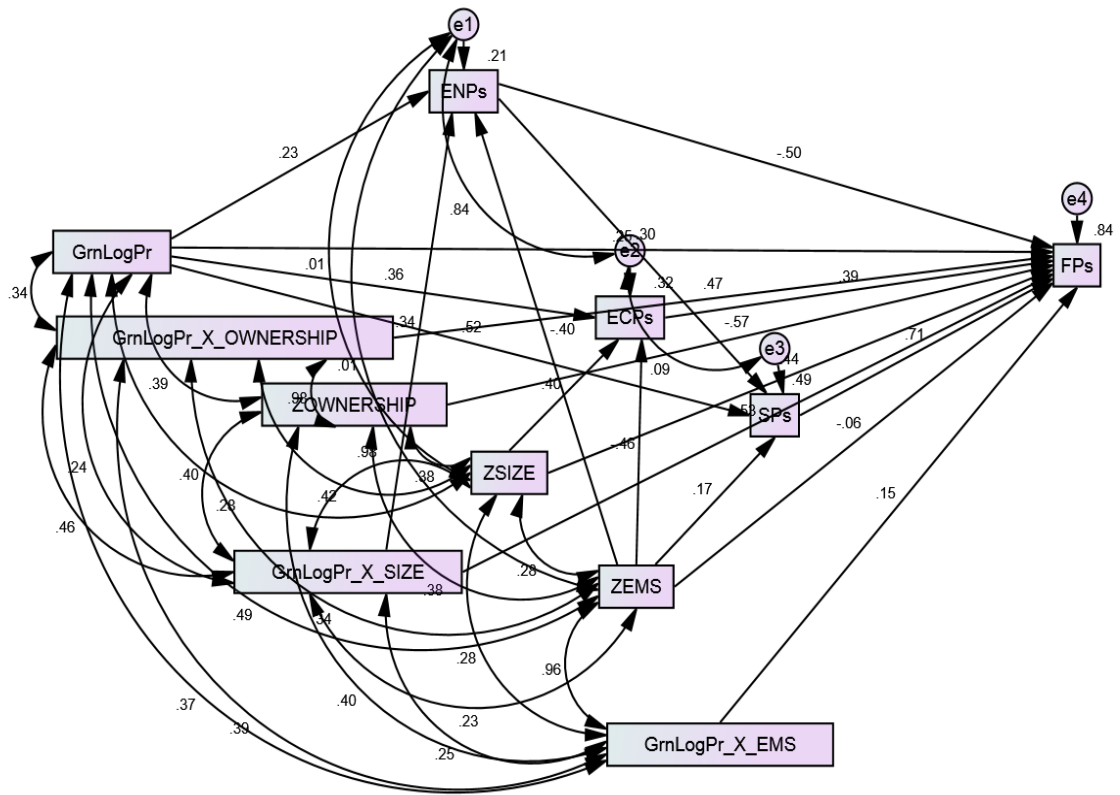
Source: Research Data (2020)

GrnLogPr = Exogenous latent construct (Green Logistics Practices)
GrnLogPr_X_EMS= Interaction term of green logistics practices and possession of EMS certification
GrnLogPr _X_OWNERSHIP= Interaction term of green logistics practices and ownership status of the firm
GrnLogPr _X_SIZE= Interaction term of green logistics practices and firm size
Zownership, ZSize and **ZEMS**= Standardized moderating variable (firm characteristics-ownership status of the firm, size of the firm and possesion of an EMS certification)
ECP, ENP, SP= Mediating variables (environmental performance, economic performance and social performance)
FPs= Endogenous construct (firm performance)

Table 4.33: Summary of Hypotheses Testing

Objective	Hypothesis	Decision
Establish the effect of green logistics practices on performance of logistics firms in Kenya.	H_1: Green logistics practices by an organization have a significant effect on the firm's performance.	Supported
Determine the influence of firm characteristics on the relationship between green logistics practices and performance of logistics firms in Kenya	H_2: Firm's characteristics moderate the relationship between green logistics practices implementation and firm's performance	Not-Supported
Examine the influence of environmental performance on the relationship between green logistics practices and performance of logistics firms in Kenya.	H_3: The relationship between green logistics practices and firm's performance is mediated by environmental performance.	Not-Supported
Establish the influence of economic performance on the relationship between green logistics practices and performance of logistics firms in Kenya.	H_4: The relationship between green logistics practices and firm's performance is mediated by economic performance.	Supported
Examine the influence of social performance on the relationship between green logistics practices and performance of logistics firms in Kenya	H_5: The relationship between green logistics practices and firm's performance is mediated by social performance.	Supported
Determine the joint effect of green logistics practices, firm characteristics, environmental performance, economic performance and social performance on firm performance of logistics firms in Kenya.	H_6: The relationship between green logistics practices, firm characteristics, environmental performance, economic performance and social performance with firm performance is significant	Supported

Source: Author 2020

CHAPTER FIVE: DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter discusses the findings of the study. The key aim of the research was to confirm the influence of green logistics practices on performance of logistics firms in Kenya. The green logistics practices studied included green packaging, route optimization, fuel efficiency, carbon emission management and reverse logistics. Firm performance was measured using the balanced scorecard approach. A set of hypotheses and a conceptual model were developed to answer the research questions. The model had five latent constructs all developed from literature. These latent constructs included; green logistics practices, firm characteristics, economic performance, environmental performance, social performance, and firm performance.

The discussion was based on six objectives, which were to; first, confirm the influence of green logistics practices on performance of logistics firms in Kenya. Second, determine the influence of firm characteristics on the connection between green logistics practices and performance of logistics firms in Kenya. Third, examine the influence of environmental performance on the link between green logistics practices and performance of logistics firms in Kenya. Fourth, establish the influence of economic performance on the association between green logistics practices and performance of logistics firms in Kenya. Fifth, examine the influence of social performance on the link between green logistics practices and performance of logistics firms in Kenya. Sixth, establish the joint influence of green logistics practices, firm characteristics, economic performance, environmental performance, and social performance on firm performance of logistics firms in Kenya. The findings are discussed in the following sections.

5.2   Green Logistics Practices and Firm Performance

The NRBV argues that competitive advantage and strategy can be fashioned from capabilities facilitating economic activities, which are environmentally sustainable (Hart, 1995). A combination of the relational view with the NRBV argues that ecological management in the supply chain can build a competitive edge. The study findings indicated that green logistics practices had a strong and positive effect on firm performance. The significance level was less than 0.001.

The results of this research revealed that green logistics practices, when implemented by a firm, could result in enhanced performance in logistics firms in Kenya. The research findings concur with conclusions from other previous studies (Lai & Wong, 2012; Abareshi & Molla, 2013). The findings support the NRBV and RBV, in that green logistics practice is a strategic resource crafted as rare, valuable, and inimitable, leading to improved firm performance (Klassen & Vachon, 2008). This gave the theoretical anchorage to this relationship. The study consequently extends the literature by adding to the positive link between green logistics practices and firm performance, therefore, reducing the uncertainty of inconsistent conclusions from previous studies on whether pursuing these practices is beneficial.

5.3   Green Logistics Practices, Firm Characteristics and Firm Performance

When green logistics practices and firm performance relationship is positively moderated by firm characteristics, then the gross effect is supposed to be higher compared to the direct relationship. Firm ownership, size and possession of EMS were the three firm characteristic variables considered. The study results indicate that firm ownership status is not a factor in determining firm performance because of implementing green logistics practices. The study findings are contrary to those of Calza et al. (2014) who indicated that ownership structure contributes greatly to firms' environmental proactivity. A possible explanation to

inconsistency could be the one suggested by Anastassopoulos (2004) who opined that, certain disadvantages may face a subsidiary getting into a foreign market can face. Domestic organizations may have a better understanding of the market as a result of having previously operated in it. Aspects related to the economic, political, and social structure of the host country can be the cause of lower profits for a foreign-owned company. Consequently, it is not obvious that a firm's ownership status will help increase the positive relationship between the implementation of green logistics practices and firm performance.

The results from the study rejected the hypothesis advanced from literature, which indicated that green logistics practices implementation would result in greater performance for large firms in comparison to small ones. The findings indicate that firm size moderates negatively the positive connection between green logistics practices and firm performance. This is consistent with the finding of Song et al. (2017) who found a moderating influence of firm size on the link between green external integration and firm performance of 176 Chinese manufacturing companies. The findings are also in line with assertions of previous researchers of firm adaptation who contend that large firms undergo pronounced trouble in reacting to fluctuating conditions (Goddard et al., 2006). Large firms are sluggish in reacting because of bureaucracy and are, therefore, left out in realizing the benefits associated with the quick execution of green logistics practices. Consequently, it is not apparent that a firm's size will help enhance the positive connection between the execution of green logistics practices and firm performance. Small firms may, therefore, be able to counteract potential negative performance effects by reducing environmental impacts in comparison to large firms and consequently have the potential of prosperous performance.

The study also rejected the hypothesis that possession of an EMS positively moderates the positive link between green logistics practices and firm performance. The findings of this

research indicate that possession of an EMS certification dampens the positive relationship between green logistics practices implementation and firm performance. These findings contradict the claim by past scholars that firms that possess an environmental management system have a more organized approach to environmental management and hence higher performance (Gonzalez et al., 2008; Testa & Irlado, 2010). A possible explanation to this contradiction could be the one given by Ann et al. (2006) that the high cost of attaining EMS certification status might lead to rerouting resources away from spending more on ecologically friendly practices. Another possible explanation to could be the one advanced by Van Der Wiele Williams and Dale (2000) who argue that for a quality certification transition from fad to fit, to take place, there must be a strong internal motivation and emotional involvement to implement it. Jiangning (2006) asserts that it is not possible to find significant differences between firms that do have and those without environmental management system certification. This is echoed by another study by Castro (2006) who analyzed the effect of an EMS certificate on Brazilian organizations and found no growth in the market value of the certified firms. This may be related to the criticism of RBV in that rare, valuable, inimitable, and non-substitutable resource is neither necessary nor sufficient for firm's continual competitive edge; the undefined value of a resource necessitates further research. Hence, there is no agreement on if possession of EMS positively moderates the link between green logistics practices and performance of the firm.

5.4   Green Logistics Practices, Environmental Performance and Firm Performance

Past studies and literature have indicated that the relationship between green logistics practices and environmental performance is expected to be positive and significant (Klassen & Vachon, 2008; Testa & Irlado, 2010; Kung et al., 2012). The current research established that green logistics practices affect the environmental performance of logistics firms positively in line with the NRBV. This is a vital additional step in understanding the green

logistics practices-environmental performance relationship since previous studies have investigated generally the green practices in the context of the supply chain with only a few focusing on the logistics practices of the larger supply chain (Lin & Ho, 2016).

The positive link between environmental performance and firm performance has been established by Mollenkopf et al. (2010), Klassen and Vachon (2013) and Odock (2016). The current research results refuted past studies in that environmental performance was established to have a statistically insignificant effect on firm performance. The mediating influence of environmental performance on the link between green logistics practices and firm performance was found to be insignificant. This is in line with the findings of Wagner (2001), who argued that there is no systematic relationship between environmental performance and firm performance. A possible explanation may be obtained from Darnall (2006) who indicated that costs related to the adoption of environmental initiatives implementation, could hinder the short-term improvement of firm performance.

Horváthová (2010) on his meta-analysis study investigating whether environmental performance affect firm performance points out that the empirical method used matters, in that, the likelihood of finding a negative link between environmental and firm performance significantly increases when using simple correlation coefficients instead of more advanced econometric analysis. This points to another possible explanation that contrary results could be caused by differences in the methodological factors, study design and study execution. This necessitates further research in view of the criticism of both RBV and the NRBV on the undefined value of a resource which rare, valuable, inimitable, and non-substitutable. Therefore, it is not clear if environmental performance mediates the positive relationship between green logistics practices and firm performance

5.5   Green Logistics Practices, Economic Performance and Firm Performance

Based on literature and past studies, the link between green logistics practices and economic performance is expected to be positive (Green et al., 2012; Hung, Chen, & Chung, 2014). This is supported by the results of this empirical investigation, which established that green logistics practices affect the economic performance of logistics companies positively. This is in line with De Giovanni (2012) assertion that customers are more than willing to buy a product from an ecologically conscious organization, which can enhance the performance of a company economically by giving it a competitive advantage.

Sibel and Bulent (2019) found a positive linkage between economic performance and firm performance. The current study results support this position, in that, economic performance was found to have a significant and positive influence on firm performance. The mediating effect of economic performance on the link between green logistics practices and firm performance was established to be significant and positive. An explanation of this could be the one given by Huang et al. (2012), when companies invest in green logistics practices, they can reduce investments on inventory, contain costs, and increase recovery of assets and this results in improved firm performance.

5.6   Green Logistics Practices, Social Performance and Firm Performance

The research empirically tested a model developed based on the argument that if a firm implements green logistics practices, its social performance will be enhanced resulting in improved firm performance. To authenticate this model the following relationships were tested; green logistics practices and social performance, and social performance and firm performance. It was anticipated that the execution of green logistics practices would result in improved social performance.

The result of this empirical investigation supports this claim. This finding adds support to the findings of positive links of past research on the connection between green logistics practices and social performance (Ruf et al. 2001; Lin et al. 2009; Wagner, 2010) This is consistent with the findings of Hallegatte et al. (2011) who upheld that, the relationship between green growth and social performance is clear since generally, changes in monetary growth are linked to social performance even where there are policies to reduce inequality. A positive association between social performance and firm performance was established by Shi and Tang (2012) while studying agricultural companies in China. This claim is supported by the result of this empirical investigation, in that, the social performance was found to have a positive and substantial influence on firm performance.

The mediating effect of social performance on the connection between green logistics practices and firm performance was established to be significant and positive. This is aligned to assertions of Lee et al. (2013) who indicate that, by engaging in social practices, firms can enhance their reputation and image, and possibly upsurge their value by growing its social performance and eventually its overall performance. The findings support the stakeholder's theory, which upholds that firms produce externalities, which can make stakeholders pressurise on firms to reduce harmful impacts (Sarkis et al., 2011). This pressure can motivate firms to embrace environment-friendly practices (Zhang & Yang, 2018).

5.7 Green Logistics Practices, Firm Characteristics, Environmental Performance, Economic Performance, Social Performance and Firm Performance

The RBV of an organization indicates that a firm has a package of resources, expertise, and abilities. The build-up and exploitation of these resources define firm performance (Pensrose, 1959). Organizations in similar industry are likely to display variances in their performance because of variances in their execution of green logistics practices. An extension of the RBV

is the NRBV, which argues that competitive advantage and strategy can be fashioned from capabilities facilitating economic activities, which are environmentally sustainable (Hart, 1995). For sustainable development, organizations should stive to strike a balance between the three TBL components. Sarkis et al. (2011) indicates that the stakeholders' theory appreciates in addition to the shareholders, there are other groups or people who the organization is devoted to, who are prone to be affected by the moves made by it. This is closely linked to the social aspect of TBL. These theoretical arguments link up with the conceptual argument of this study.

Green logistics practices had a solid, positive effect on firm performance. As a company's resource base concerning green logistics practices grows, the firm is predisposed to experience enhanced performance, as they can deploy green logistics practices where they are deserved. The findings support the natural RBV, RBV, TBL and the stakeholders' theory, which provided theoretical anchorage to this relationship. Although the implementation of green logistics practices involves great initial investments, advantages such as increasing operational efficiency, waste reduction, saving energy and customer image can overshadow the costs (Abdullah & Yaakub, 2014).

Literature has described diverse results on the link between firm ownership, firm size, possession of EMS and firm performance. The results of the current study established a negative and significant link between ownership and firm performance. Firm ownership implies an authority source that a firm can use to support decision-making in safeguarding the investors' interests (Fazlzadeh et al. 2011). Based on the results of this study, firms with both local and foreign ownership do not perform better than firms with local ownership. This may be because a subsidiary getting into a foreign market can be confronted by certain disadvantages. It would be anticipated that aspects linked to the structure of competition,

coupled with the economic, political and social structure of the host country can be the reason for lower profits for a foreign-owned firm. Domestic organizations may be further along the learning curve as a result of having formerly operated in the market (Anastassopoulos, 2004).

Firm size was established to have a positive and significant link with firm performance. The findings of this study support those of Hassan, Balan, and Prakash (2016) who established a positive and significant link between firm size and firm performance. They indicated that small organizations may find it hard to apportion resources for green practices for which possible paybacks may not emerge in the short-run. The results of this study contradict the findings of Saeed, Murtaza, and Sohail (2013) who argue that there are always communication challenges among the board of directors of a large firm. Dean and Shell (1991) argue that the complexity of large organizations makes it very difficult for managers in these organizations to effect change.

Possession of EMS certification by a firm was established to have a negative and non-significant effect on firm performance. A possible explanation to this may be the one given by Kuo et al. (2009) who assert that firms continue to lag in converting resources to performance due to the wrong reasons for seeking ISO registration. The environmental management system certification does not assure to improve quality but offers documentation tools that have quality improvement potential.

Previous research has indicated mixed results on the connection between environmental performance and firm performance with some reporting positive relationships (Klassen & Vachon, 2013; Mollenkopf et al., 2010; Odock, 2016) and others establishing no link between the two variables (Rao, 2002; Green et al., 2012). In the current study, environmental performance was found to have a significant and negative influence on firm performance. This may be due to the costs related to the enactment of ecological initiatives,

which could in the short term hinder improved firm performance (Darnall, 2006). The study findings indicated a significant and positive association between economic performance and firm performance. This is consistent with the findings of previous research by Sibel and Bulent (2019) who argued that the cost implications of economic performance should lead to enhancement in the general performance of the firm.

Mixed results were obtained with previous research on the link between social performance and firm performance. Some studies reported positive relationships (Shi & Tang, 2012; Lee et al. 2013). However, Li (2006) found out that increased social performance activities were related to a decrease in a firm's value in the short term but not in the long term. The current study results indicated a significant and positive link between social performance and firm performance. A possible explanation to this could be the assertions of Matthew, Ogbonna and Harris, (2012) that social management system, concentrating on employees, educating, and motivating workers, could enhance firm performance through superior productivity.

5.8   Conceptual Framework with Findings

The studies established a positive link between green logistics practices and firm performance. The revised conceptual framework in Figure 5.1 supports this direct and positive relationship. The framework further established that the link between green logistics practices and firm performance was negatively moderated by firm characteristics (EMS and size), and positively mediated by both social performance and economic performance. Environmental performance negatively mediated this relationship. Furthermore, the direct influence of green logistics practices, economic performance and social performance with firm performance was positive.

Figure 5.1: Conceptual Framework with findings

β= 0.646***   H₁

Environmental Performance
- Waste produced
- Energy usage
- Air and water quality

β= -.00ns   H₃

Green Logistics Practices
- Reverse Logistic
- Fuel Efficiency
- Carbon Emissions Management
- Green Packaging
- Optimization of Routes

Economic Performance
Cost cutting on:
- Material purchased
- Environmental accident fines
- Waste treated
- Energy consumption bills

β=.020**   H₄

Firm Performance
- Financial Perspective
- Customer Perspective
- Internal processes Perspective
- Learning and growth perspective

Social Performance
- Human rights
- Labour practices
- Product responsibility
- Community impacts

β=.361**   H₅

β=.917**   H₆

Firm Characteristics
- Ownership β= -.07ns
- Size β= -1.264***
- Possession of EMS Certification β= -.638***

H₂

***p < 0.001, **p < 0.05, *p < 0.10, ns – not significant   Source: Author (2020)

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of findings, conclusion and recommendations of the results of the six hypotheses of this study. Moreover, the empirical and theoretical contributions of the research are discussed. Afterwards, managerial inferences and policy implications are also discussed. The chapter then presents the main limitations of the research and recommendations on policy and practice along with suggestions for further research.

6.2 Summary of Findings

The main aim of this study was to confirm the relationship between implementing green logistics practices and performance of logistics firms in Kenya. Specifically, to determine the influence of firm characteristics on the link between green logistics practices and performance of logistics firms in Kenya; determine the influence of economic performance, social performance, and environmental performance on the connection between green logistics practices and performance of logistics firms in Kenya; determine the joint effect green logistics practices, firm characteristics, social, environmental and economic performance on firm performance of logistics organizations in Kenya.

The first objective was to confirm the association between green logistics practices and firm performance and was tested using CB-SEM. The findings of the study showed that there was a positive and significant link between the execution of green logistics practices and firm performance. Green logistics practices construct explained 42 per cent of the variance in firm performance. The meaning of this is that, if green

logistics practices construct was to be eliminated from the model, the change in the variance explained in firm performance would be substantive. This implies that other variables explain 58% of the variation in firm performance.

The second objective was to establish the moderating effect of firm characteristics on the link between green logistics practices and firm performance. To pursue this objective, AMOS 23 was employed. The specific firm characteristic variables studied included ownership status, size of the firm and possession of an EMS certificate by the firm. The findings revealed that firm size and possession of an EMS certification had a significant negative moderating effect on the connection between green logistics practices and firm performance. However, firm ownership status was established to have a moderating influence which was non-significant on the link.

To confirm the mediating effect of environmental performance on the relationship between green logistics practices and firm performance was the third objective. To pursue this objective, Gaskin's AMOS Estimand was employed. Green logistics practices had a significant and positive effect on firm performance. Again, the link between green logistics practices and environmental performance was also positive but insignificant. The environmental performance had a statistically insignificant effect on firm performance. Hypotheses testing results found out that environmental performance does not mediates the positive link between green logistics practices and firm performance.

Establishing the mediating effect of economic performance on the link between green logistics practices and firm performance was the fourth objective. Green logistics practices had a significant and positive influence on both economic performance and firm performance. The association between green logistics practices and economic

performance was also positive and significant. Again, the connection between economic performance and firm performance was established to be significant and positive. Hypotheses testing results on the mediating role of economic performance on the positive connection between green logistics practices and firm performance showed that there was a positive and significant partial mediation.

Establishing the mediating effect of social performance on the connection between green logistics practices and firm performance was the fifth objective of this study. Green logistics practices had a significant and positive effect on the performance of the firm. The link between green logistics practices and social performance was also positive and significant. The social performance had a positive and significant effect on firm performance. The hypotheses testing results established that social performance partially mediates positively the relationship between green logistics practices and firm performance.

The last objective sought to confirm the joint influence of green logistics practices, firm characteristics, social performance, economic performance, and environmental performance on firm performance of logistics organizations in Kenya. The findings of the research showed that green logistics practices and the interaction term of green logistics practices and firm size were significantly and positively related to environmental performance. Possession of EMS certification was established to have a significant negative connection to environmental performance. Green logistics practices and firm size were established to have a significant and positive connection to economic performance, while this link was negative and significant for EMS. There was a positive and significant link between social performance and green logistics practices, EMS and environmental performance.

There was a significant and positive connection between green logistics practices, firm size, economic performance, social performance, the interaction term of green logistics practices and ownership and firm performance. Social performance was established to have the strongest positive influence on firm performance among the factors researched. The interaction term of green logistics practices and EMS had an insignificant but positive influence on firm performance. Environmental performance, firm ownership and the interaction term of green logistics practices and size were established to have a significant and negative effect on firm performance while possession of an EMS certification had an insignificant negative influence on firm performance. The joint effect for all constructs was established to be greater than the individual effects of green logistics practices, firm characteristics, environmental performance, economic performance, and social performance.

A framework and conceptual model for conceptual understanding were developed to aid the research to attain the study aims and to answer the research questions. The study sought to determine the link between green logistics practices and firm performance; the moderating influence of firm characteristics on the link between green logistics practices and firm performance; the mediating influence of economic, environmental and social performance on the connection between green logistics practices and firm performance; and the joint effect of green logistics practices, firm characteristics, environmental, economic and social performance; and organization performance of logistics firms in Kenya. The research was attached to the positivistic philosophy in testing the six quantitative hypotheses. Primary data was collected from Kenyan logistics firms

6.3 Conclusions of the Study

The research concluded that when logistics organizations implement green logistics practices, it plays a critical role in influencing the environmental, economic, and social; and eventually the overall performance of Kenyan logistics firms (Lubin & Esty, 2010; Abareshi & Molla, 2013; Subramanian & Gunasekaran, 2015). This conclusion is true regardless of the ownership status of the firm. If the firm is large or possesses an EMS certification then the link between the execution of green logistics practices and firm performance dampens. The results support the views of resourced based view, natural resourced based view, triple bottom line and stakeholders' theory confirming that green logistics practices do affect firm performance.

The study concludes that out of the three firm characteristics: ownership, size, and EMS certification; firm size, and possession of an EMS moderate negatively the link between green logistics practices and firm performance while ownership status has no significant influence on this relationship. This means that the implementation of green logistics practices results in improved firm performance irrespective of firm ownership status. The study also concludes that economic performance and social performance do mediate the connection between green logistics practices and firm performance. However, environmental performance does not mediate this relationship.

Several conclusions can be drawn based on the findings; green logistics practices were established to relate positively to economic and social performance but insignificantly related to environmental performance. Additionally, economic performance and social performance positively associated with firm performance. Conversely, the link between environmental performance and firm performance was

insignificant. Furthermore, firm size positively and significantly relates to economic performance. Based on respondent responses, environmental performance and possession of an EMS certification are significantly and positively related to social performance. Likewise, the ownership status of the firm and possession of an EMS certification by a firm harms firm performance. This research divulges that firm size positively and significantly relates to the firm performance of the logistics firms studied.

The study has concluded that there is a direct relationship between environmental performance and social performance. This means that the relationship between environmental performance and firm performance is indirect through social performance. Social performance has the strongest positive mediation effect on green logistics practices and firm performance. This link was very important in creating an overall link of all the elements in the study and therefore reaffirming both the conceptual and the theoretical anchorage of this study. The theories; RBV, the NRBV, the TBL theory, and the stakeholders' theory are reaffirmed. The results of this study are in line with the environmental and climate change advocates that greater benefits are to derived from greenness.

6.4   Contributions of the Study

The key contributions and implications of this research are to knowledge, theory, management, and policymakers. While it is critical to reflect on the findings of this study against the framework of previous research, evaluating the implications eventually forms the basis for systematic improvement in practice and future empirical work. By ascertaining the effect that green logistics practices have on the firm performance through environmental, economic and social performance, this

research was capable of clarifying how green logistics practices studied contribute to environmental, economic, social and firm performance. This evidence adds to the prevailing body of experimental proof within the Kenyan context.

6.4.1 Contribution to Theory

This study was anchored on four theories which include the RBV, natural RBV, TBL and stakeholders' theories. The key theory on which this study was grounded in is the natural RBV. The study adopted a green logistics framework which comprised of activities which include green packaging, fuel efficiency, route optimization, carbon emission measurement and reverse logistics.

The study took the position that the execution of green logistics practices gives the firm a chance for competitive advantage and performance enhancement through socially complex and inimitable causally ambiguous resources. When a firm involves all its employees in implementing green logistics practices, it allows them to acquire tacit skills that are refined as they gain more experience. Since these skills are hard to observe in practice, competitors find it difficult to imitate them quickly. Hence, a chance for sustained competitive advantage and performance improvement is availed to the firm through a unique causally ambiguous resource.

The study further argued that green logistics practices rely on a great network of teams or people involved in synchronised action which few individuals, if any, have enough scope of knowledge to execute (Shi et al., 2012). These activities require the establishment of consensus across functions, departments, and organizational boundaries. The balancing act among supply chain associates to ensure that the execution of these activities is optimized without hurting the natural environment is a socially complex resource which can create an opportunity for sustained competitive

advantage for the firm (Vachon & Klassen, 2007; Shi et al., 2012). This research gave empirical proof that the execution of green logistics practices results in enhanced firm performance because the firm builds a causally vague and socially complex resource that is hard to duplicate which is in line with the natural resource-based view (Hart, 1995).

The results of this study have also demonstrated that the resource-based view of the firm is an important theory in the study of the relationship between green logistics practices and organizational performance. This spreads the empirical and conceptual research in areas related to green logistics by proposing that possession of knowledge and capabilities to implement green logistics practices is a resource that is imperfectly imitable, valuable, exceptional and non-substitutable (Barney, 1991; Hart, 1995; Crook et al., 2008). The findings of this study show that this is a strategic resource because it leads to competitiveness in the form of improved environmental, economic and social performance, which ultimately translates to enhanced firm performance.

The overall results indicated significant importance of stakeholder's theory as it enabled this study to understand the logistics firm in Kenya in ways of creating and managing various groupings as well as relationships formulated strategically. The stakeholders' notions or management of stakeholders or their approaches to business management are formulated and implemented through a process of satisfaction of various groups and individuals with a business stake. Stakeholders put pressure on firms to decrease harmful effects and they also control the opinion of the public regarding the firm. Managerial and employee stakeholder pressure can lead to a worthy loop of practical ecological approaches like green logistics practices (Sarkis et al., 2011). The research results show that stakeholder involvement has a strong and

positive influence on competitive edge because it leads to improved economic, environmental, and social performance, which finally results in improved firm performance.

The triple bottom line theory was an essential pillar in the environmental, economic and social performance relationship to firm performance among logistics firms. The research suggests that a company that desires to be sustainable in their pursuit for profit should also add to sustainable growth by ensuring environmental, economic, and social benefits. Establishing environmental and social initiatives can permit executives to execute a strong strategic value, which leads to improved firm performance (Porter & Kramer, 2006).

6.4.2 Contribution to Knowledge

The chief input to knowledge by this research is that, although several researchers have claimed the firm performance benefits that accrue from green-related practices, only a few studies have empirically studied the performance effects of green logistics practices (Lin & Ho, 2016). Therefore, through theoretical explanation and empirical assessment, the study contributes to greater clarity and a better understanding of the linkages between green logistics practices and firm performance with the mediation of economic performance, environmental performance, and social performance. Thus, whereas studies on green practices tend to focus on illustrating how they impact environmental and economic performance, this study delivers a contribution by going further and additionally investigating the influence of green logistics practices on social performance and the overall firm performance.

Theoretical foundation and prior empirical analysis have established that the execution of green logistics practices has a positive direct influence on firm

performance. Effectively, the finding contributes to the body of knowledge on positive links between the effectiveness of implementing green logistics practices and firm performance. This result helps establish the true effect of implementing green logistics practices on firm performance. This research extends the literature by employing a measurement model of green logistics practices construct in the service sector predominantly the logistics industry and moving away from the manufacturing organizations. Kassinis and Soteriou (2003) assert that the researcher's attention is shifting and are now being attracted to environmental practices in service sectors.

Although a lot of research is addressing the ecological sustainability issue in the whole of the supply chain, Lin and Ho (2016) highlight that in the last decade, few studies have centred on environmental concerns in the logistics industry. The research concentrates on the logistics industry, which contributes to about a quarter of emissions of Green House Gases (GHG), which is energy-related globally (Venus, 2011). It considers green packaging, carbon emission measurement, fuel efficiency, route optimization, and reverse logistics practices as applied in the logistics industry and as emphasized by several scholars (Wu & Dunn, 1995; McKinnon, Browne, & Whiteing, 2012; Lars, Hampus, & Henrik, 2014; Weng & Chen, 2015). This research, therefore, focuses on a sector largely ignored by past studies, which concentrated on other industries (Kinoti, 2012; Weng & Chen 2015; Odock, 2016).

This study adds to the knowledge pool by examining the paths that boost firm performance on the execution of green logistics practices. The results suggest that firm performance will be improved if economic performance and social performance are enhanced after implementing green logistics practices. Besides, this study which used the powerful SEM technique demonstrates that positive environmental

performance plays a critical role in accomplishing successful social performance, which in turn improves firm performance.

The research adds to the existing literature by looking at environmental, economic and social performance as mediating variables. This is consistent with recommendations of past researchers (Green et al., 2012; Lee et al., 2012) on the need to explore mediating variables that could help bring out the link between green practices and firm performance more fully. The findings provide that both economic and social performance play a mediating role in the associations between the execution of green logistics practices and firm performance.

The current research also broadens knowledge by considering the moderating effect of firm characteristics on the connection between green logistics practices and firm performance. This advances the argument of Jacobs, Singhal, and Subramanian (2010) on the need to consider moderating variables that can bring out the relationship more fully. Interestingly, the results suggest that out of the three firm characteristic variables, firm size, and possession of an EMS certification moderate negatively the relationship between green logistics practices and performance of logistic organizations in Kenya. This highlights to small logistics firms without EMS certification to embrace green logistic practices for enhanced performance. The findings, therefore, contribute to the debate on the effect of firm characteristics on the link between green logistics and firm performance thus opening the gates for further research.

Lastly, the outcomes also advance understanding of the green logistics practices and firm performance relationship in Kenya. As highlighted, the empirical testing and theoretical advancement have been centred commonly in a developed country context.

Comprehending the firm performance of logistics firms from a less developed country is likewise imperative for a better understanding of the phenomena for researchers. Consequently, the research has contributed to the literature by combining developing country data in the broader experimental generalizations of the findings from a logical viewpoint.

6.4.3 Contribution to Policy

The current study provides useful information to national policymakers. From a government standpoint, motivating organizations to go green is a smart choice given that green logistics practices have a positive effect on firm performance and will, therefore, contribute to economic growth and development. Policymakers must provide mechanisms that support firms as they implement green logistics practices. The research found that an increase in the level of enactment of green logistics practices is accompanied by an increase in performance. This conclusion effectively helps dismiss doubts of those firms that have not yet implemented green logistics practices. The results of this study will be of specific interest to industry regulators and government agencies that can provide information on green logistics practices and aid in the implementation of the same to improve Kenyan firms' capabilities.

In the long run, the monetary growth of any country is determined by how organizations prosper in their operations. Consequently, it would be imperative to comprehend how logistics firms can be motivated to execute green logistics practices. It is expected that this finding of this study would assist in the development of an appropriate regulatory framework in Kenya's pursuit of environmental sustainability. Green logistics courses can be facilitated by government agencies like the National Environment Management Authority (NEMA) and to pass the information on how

green logistics practices can enhance organizational environmental, economic, social and firm performance. Those who seek specific orientations opportunities on green practices can be assisted by the government in terms of tax breaks and capital allowances to nurture green investment and growth. Setting such guidelines that seek to protect the environment while promoting industrial growth will be in line Kenyan vision 2030. The vision's environmental management social sector ensures the building of a cohesive and just society that enjoys unbiased social maturity in a secure and clean environment.

6.4.4 Contribution to Practice

The argument from the finding of this study is that ecological sustainability is a logistics level imperative and evidence has been provided backing up the requirement for logistics firms to implement green logistics practices in partnership with suppliers, employees, consumers, and other stakeholders. Logistics executives have had to cultivate logistics skills and knowledge besides the ones essential to manage at the firm level. They need now to emphases on refining the supply chain to improve firm performance.

The study reiterates the importance that firms embrace green logistics practices and work to enhance the methods that spread across the logistics chain to satisfy the final consumers better. However, logistics executives are held accountable for their firm's performance. If refining the logistics chain and final consumers' satisfaction eventually leads to enhanced firm performance, executives will embrace such a method. Therefore, KIFWA can emphasis among members to embrace green logistics practises as they lead to general enhancement of their performance. The study purposed to discover if the execution of green logistics practices will amount to enhanced environmental, economic, and social performance and consequently better

firm performance specifically in Kenya. Kenya is the eastern African regional infrastructure hub and therefore the benefits of green logistics practices can easily be gained by other logistics firms in the region who have strong trade ties with Kenya.

The empirically supported and theorized model compromises an organized methodology to the effective enactment of an ecological sustainability plan that requires logistics firms to work hand in hand with both customers and other stakeholders while embracing technology to attain desired outcomes – a better environment with a complimentary enhancement in firm performance. Once green logistics practices have become a strategic focus, logistics firms can start to implement them with some level of credence that the practices will result to not only enhanced environmental, economic and social performance but also better firm performance. The execution of green logistics practices increases the firm's abilities to sustain the environment and to fortify the firm's economic and social viability.

6.5   Recommendations of the Study

The research recommended that the enactment of green logistics practices should be advocated to ensure the sustainability of not only the current generation but also the coming generation. This is because operations of the logistics industry are the most widely recognized to affect the natural environment in the greatest negative way. This study has established that implementing green logistics practices leads to enhanced firm performance. Therefore, logistics organizations should implement ecologically rigorous practices in all segments of their operation and the larger supply chain, starting with practices like green packaging, fuel efficiency, optimization of routes, carbon emission measurement and reverse logistics. In so doing, they are expected to

perform better ecologically, economically, socially and eventually the overall firm performance will improve.

Even though the findings provide that environmental performance does not play a mediating role in the relationships between the implementation of green logistics practices and firm performance, this study recommends that it should be emphasized. This is because the study results have indicated that the relationship between environmental performance and firm performance is indirect through social performance. The social performance was found to have the strongest positive and significant effect on firm performance. This suggests that logistics firms' executives must ensure that aspects of social performance, as well as those of environmental performance, are enhanced to improve their performance.

6.6   Limitations of the Study

This study has limitations; this cross-sectional study is limited logistics firms in Kenya of the 892 companies who were members of KIFWA in 2018. Therefore, firms that were not members of KIFWA were not included in the sampling frame though they might have had green logistics practices in their operations. Therefore, the results may lack robust external validity. For the generalizability of the research to increase, other firms who may not be KIFWA members and probably in other countries should be studied.

The study proposed and assessed a detailed green logistics practices and firm performance model. The researcher believes that the main input of this research falls in the broad nature of the model as opposed to analyzing and measuring bits of the model. This method, however, stretches the sample borders, instead of embracing the old-style path analysis approach directed by a huge number of constructs in

comparison to the small sample size, the researcher chose to push the borders of SEM to measure the fit of the whole model to the data. It was crucial to cut the number of measurement scale items from 71 to 66 to confirm that the degrees of freedom surpass the number of parameters estimated.

Lastly, this research was a cross-sectional study using a quantitative approach that captured the perception of one respondent per organization at a specific point in time. Though this approach is effective in gathering the perception about the changing aspects of performance at a precise point in time, green logistics practices, environmental, economic, social and firm performance, fluctuate in a way that longitudinal studies lead to better and diverse perceptions. The data may have been affected by the respondents' inclination of any occasions that might have occurred previously or circumstances at the point of filling in the research instrument. Collecting data from a single country (Kenya) enabled control of diversity but limited the generalizability of the findings. Recognizing these limitations, the research validates the established framework and these limitations did not affect the quality of this research and the following section discusses recommendations addressing these issues.

6.7   Suggestions for Further Research

Given the limitations and guidelines for future studies, the research points out various research opportunities, which have not been sufficiently addressed. Firms now not only face economic rivalry in the market, but also social and environmental pressures (Wu & Pagell, 2011). The trade-offs between environmental impact, social influence and economic interests signify an area that has been studied by practitioners and academics for several decades and remains critical in the contemporary climate. The

subsequent concerns are suggested for further examination based on the results of this study.

First, while the use of perceptual measures is widely recognized in management research, this stream of studies could be enhanced by using other data sources, such as objective data and real metric for performance outcomes evaluation. Furthermore, while the respondents of this study were managers who presumably have sufficient knowledge and are in a position to take an all-inclusive view across the firm, biases can occur, since there is only one information source. Consequently, the research could be enhanced by involving different executives in the participating firms to respond to the dependent and independent variables. Thus, future studies should seek to utilize several respondents from every participating firm to reduce common method bias and improve reliability. Again, a deeper qualitative approach could be employed to study the moderating and mediating effects of firm characteristics and environmental performance respectively, on the relationship between green logistics practices and firm performance.

Second, since this research was carried out over a limited period, a longitudinal study of the study topic has not been undertaken. In a logistics firm, green logistics practices affect firm operations but may do so with a time lag. Hence, the findings of the current research may differ from a long-term outlook. Therefore, a longitudinal study ought to be carried out to further authenticate the findings. Additionally, as the findings indicated, the execution of green logistics practices often occurs chronologically—from environmental practices through to social ones. Consequently, green logistics practices and firm performance can dynamically affect one another.

Given these observations, a longitudinal study employing the same questionnaire would be of interest.

Third, because of limited accessible data, the study targeted Kenyan logistics industry only. Given the current expansion of global supply chains, green logistics should be looked at within the framework of the international operations of global firms. In that case, green logistics practices may vary between regions and countries. Consequently, extra effort must be given to growing a firm database with which to further explore green logistics issues from a regional and global perspective. This mission will be an uphill task, but the result will be tremendously valuable in defining green logistics practices in global firms.

The fourth likely opportunity for future study is the examination of the interrelationship between green logistics practices and operational performance. Such an investigation is essential for examining if green logistics practices can be assimilated into a firm's overall operations plan together with the triple bottom line approach. Often, a logistics firm describes its operations plan with the main focus being economic performance. As social and environmental facets are becoming imperative in logistics, these issues should be incorporated into operations strategy for sustainable development of firms. Future research could be directed towards scrutinizing the effects of such a combination.

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APPENDICES

Appendix I: World logistics ranking: LPI, CO$_2$, CH$_4$, NO$_2$,

Logistics Performance Index Rank	Country	CO$_2$ emissions from liquid fuel consumption (kt)	CO$_2$ emissions from liquid fuel consumption Rank	Methane emissions (kt of CO$_2$ equivalent)	Methane emissions rank	Nitrous oxide emissions (thousand metric tons of CO$_2$ equivalent)	Nitrous oxide emissions rank
1	Germany	250,320	2	55,721	3	43,411	2
2	Luxembourg	6,978	10	1,169	10	473	10
3	Sweden	32,350	7	10,304	5	5,222	6
4	Netherlands	67,003	4	19,026	4	8,924	4
5	Singapore	33,436	6	2,386	9	1,909	8
6	Belgium	49,662	5	9,243	6	8,503	5
7	Austria	30,286	8	8,007	7	3,790	7
8	United Kingdom	162,353	3	58,980	2	25,335	3
9	Hong Kong, China	9,751	9	3,147	8	476	9
10	United States	2,114,139	1	499,809	1	288,878	1

Source: World Bank 2018

Appendix II: Transport and Storage - Value of Output, 2014 – 2018 (KSh. Millions)

	2014	2015	2016[+]	2017*	2018*
Road Transport	595,726	629,045	662,926	698,148	782,881
Railway Transport	5,357	6,282	4,927	3,629	11,366
Water Transport	49,840	55,712	60,845	64,750	67,761
Air Transport	139,912	147,447	147,637	161,678	191,723
Services Incidental to Transport	54,097	68,246	83,996	107,841	136,939
Pipeline Transport	21,030	22,210	24,254	26,840	28,153
Postal & Courier Services	27,179	27,925	29,464	29,244	33,183
Total	893,141	956,867	1,012,051	1,092,130	1,252,006

*Provisional

[+]Revised

Source: KNBS (2018). *Economic survey 2018*. p. 200.

Appendix III: Operationalization of Green Logistics Practices

a) Green Packaging Practices (Wu & Dunn, 1995; Laosirihongthong et al., 2013; Molina-Besch&Pålsson 2014)

GPa	Recyclable materials (bio-plastic, paperboard, cardboard) when packaging for vendors
GPb	Packaging using natural materials like dye-free paper which are less hazardous to the environment
GPc	Custom created packaging boxes to preserve materials and space throughout the distribution process.
GPd	Making a continuous effort to find new reusable materials for packaging.
GPe	Altering the shape of products or reducing the size to eliminate or curb the need for packaging, by arranging products in different ways or condensing liquid formulas
GPf	Cooperating with vendors to use life cycle assessment to evaluate environmental impact of packaging during design and to standardize packaging
GPg	Adopting systems that encourage returnable packaging methods

b) Fuel Efficiency Practices (Lars, Hampus & Henrik, 2014).

FEa	Training drivers to practice fuel efficient driving techniques
FEb	Ensuring correct tyre maintenance to enhance fuel efficiency
FEc	Using fuel-efficient vehicles.
FEd	Implementing a continuous preventive maintenance program for vehicles.
FEe	Leveraging technology that aid in analysing fuel purchases and vehicle performance.
FEf	Integrating real-time visibility of inventory in the warehouses aimed at reducing unnecessary trips
FEg	Organizing supplier consignments to combine freight costs and negotiate better rates and leverage multiple modes (e.g. Use of railway line).

c) Optimization of Routes Practices (Weng & Chen (2015, Lars, Hampus & Henrik, 2014).

ORa	Positioning in real-time using precise geo-coding (GPS) to present a map view of the current positions of vehicles
ORb	Directing drivers by automatically providing driving directions based on run sheet data to the trucks next stop.
ORc	Providing a graphical view of the calls to a driver, re-calculating automatically the route when a driver selects a manual stop, which is out-of-sequence.
ORd	Having statistics on driver and fleet to offer an enhanced level of understanding of fleets operational efficiency and help in pinpointing areas where costs can be reduced or improve productivity like in regrouping of goods.

d) Carbon Emissions Management Practices (McKinnon,Browne & Whiteing,2012)

CEa	Obtaining from vehicle manufacturers a Life Cycle Assessment (LCA) showing the complete carbon emission from the vehicle assembly to its usage and its disposal.
CEb	Purchasing carbon offsets to compensate all carbon emissions caused by our vehicles e.g. tree planting.
CEc	Replacing older vehicles with newer ones, which emit less to the environment.
CEd	Using vehicles with less engine capacity For small consignments
CEe	Carbon emission report has all information needed for decision making by both the external and internal users.
CEf	Carbon emission information is reported in a coherent, neutral and factual manner based on audit trail, which is clear.

e) Reverse Logistic Practices (Wu & Dunn, 1995; Krumwiede& Sheu, 2002; Rao 2007).

RLa	Offering product vendors, the product recall or packaging return or take-back service
RLb	Making customers aware of product recall service provided by the company
RLc	Providing logistics service for reusable containers to product vendors
RLd	Providing logistics service for on-site disposition
RLe	Providing to product vendors, rework services for their returned products
RLf	Receiving logistics services from a vendor for liquidation of returned products
RLg	Offering special incentives to those who return packaging materials.
RLh	Providing suitable guidance to clients on the environmental aspects of handling, usage and disposal of the vendor's products.
RLi	Returning used packaging and products to suppliers for recycling or reuse.
RLj	Offering consolidate freight in cases where used material and packaging is to be shipped back to the vendor.

Appendix IV: Operationalization of Environmental, Economic, Social and Firm Performance

a) **Environmental Performance** (Zhu & Sarkis, 2008; Iraldo et al., 2009; Testa & Irlado, 2010; Kung et al., 2012)

ENPa	Fume emissions
ENPb	Oil waste/Spillage.
ENPc	Solid waste reduction e.g. damaged/unusable vehicle parts.
ENPd	Amount of fuel used
ENPe	General quality of environment through reduced noise pollution
ENPf	Consumption of dangerous and toxic substance like usage of diesel for our vehicles.

b) **Economic Performance** (De Giovanni, 2012; Savitz & Weber, 2006; Hampus & Henrik, 2014; Zhu et al. 2008)

ECPa	Maintenance cost for our vehicles
ECPb	Cost of waste oil treatment
ECPc	Overall oil discharge fee
ECPd	Traffic accidents fine e.g. insurance premiums
ECPe	Overall fuel cost

c) **Social Performance** (Graves & Waddock, 1997; Lin, Yang & Liou, 2009; Ruf, Muralidhar, Brown, Janney & Paul 2001; Wagner, 2010)

	Social Impact
SPa	Reduction in the number of road accidents
SPb	Offering logistical support in providing transport or storage to humanitarian aid organizations during emergency situations.
SPc	Standing against human trafficking for purpose of labour.
SPd	Payment of salaries that are above normal wage rate and adjusted for inflation.
SPe	Improved employee job satisfaction.
SPf	Enhanced safety and health of employees.
SPg	Increase in the number of long-distance truck drivers visiting roadside wellness centres that focus on infectious diseases and HIV.
SPh	Improved human rights advocacy e.g. avoidance of child labour.
SPi	Improved product responsibility e.g. Customer health and safety.
SPj	Decrease in the number of vehicles getting stuck in traffic Jams.
SPk	Decrease in the number of corruption cases e.g bribery.

d) Firm Performance (Claycomb, Dröge & Germain, 1999; Kaplan & Norton, 2010; Antônio, Cunha & Lisa, 2015)

	Financial Perspective
FPFPa	Increase in profitability
FPFPb	Revenue growth
FPFPc	Increase in return on assets
	Customer Perspective
FPCPa	Increase in the number of items delivered on time to customers
FPCPb	Reduction in the number of items damaged on transit
FPCPc	Market share growth
	Internal processes
FPIPa	Introduction of new logistical services
FPIPb	Increased capacity utilization e.g. optimal loading of our trucks
FPIPc	Increase in the number of logistical quality controls
	Learning and growth perspective
FPLGa	Increase in the number of implemented innovations by employees
FPLGb	Reduced rates of staff turnover
FPLGc	Increase the productivity of employees
FPLGd	Increase on the number of employees on self-education
FPLGe	Increase in the percentage of employees with higher education
FPLGf	Increase in the number of training courses attended by employees

Appendix V: Data Collection Letter

UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES & SOCIAL SCIENCES
SCHOOL OF BUSINESS

Telephone: 4184160-5 Ext 215 Telegrams: "Varsity'" Nairobi Telex: 22095 Varsity	P.O. Box 30197 Nairobi, KENYA

15ᵗʰ May, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

INTRODUCTORY LETTER FOR RESEARCH
MUTUA DANIEL MUTIE – REGISTRATION NO. D80/60525/2013

The above named is a registered PhD candidate at the University of Nairobi, School of Business. He is conducting research on *"Green Logistics Practices and Performance of Logistics Firms in Kenya. "*

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the research project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your assistance will be highly appreciated.

Thank you.

Prof. Mary Kinoti
Associate Dean, Graduate Business Studies
School Of Business

MK/rm

Appendix VI: Research Permit

THIS IS TO CERTIFY THAT:
MR. DANIEL MUTIE MUTUA
of UNIVERSITY OF NAIROBI, 45548-100
NAIROBI,has been permitted to conduct
research in *All Counties*

on the topic: *GREEN LOGISTICS*
PRACTICES AND PERFORMANCE OF
LOGISTICS FIRMS IN KENYA

for the period ending:
7th June,2020

Permit No : NACOSTI/P/19/25714/30717
Date Of Issue : 7th June,2019
Fee Recieved :Ksh 2000
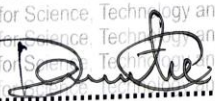
Applicant's
Signature

Director General
National Commission for Science,
Technology & Innovation

Appendix VII: Questionnaire

SECTION A: ORGANIZATION PROFILE

Please indicate the following data that characterize your organization

1. What position do you hold in the company

   [ ] Top management   [ ] Supervisory level

   [ ] Middle Management   [ ] Non-managerial

2. What is the ownership status of your firm? (tick one)

   [ ] Local   [ ] Both Local and Foreign

   [ ] Foreign

3. What is the size of your fleet (Number of trucks in owned or outsourced?)

   [ ] Less than 20 trucks   [ ] 20 to 50 trucks

   [ ] 51-100 trucks   [ ] More than 100 trucks

4.   Does your organization have Environmental Management System (EMS)?

   (Tick one)   [ ] Yes   [ ] No

SECTION B: GREEN LOGISTICS PRACTICES

Green Packaging Practices

5. Please indicate the extent to which the following practices are implemented in your organization.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

	1	2	3	4	5
a) Our firm uses recyclable materials (bio-plastic, paperboard, cardboard) when packaging for vendors					
b) Our organization is packaging using natural materials like dye-free paper which are less hazardous to the environment.					
c) Our firm has custom created packaging boxes to preserve materials and space throughout the process of distribution.					
d) Our organization is making a continuous effort to find new reusable materials for packaging					
e) Our firm is altering the shape of products or reducing the size to eliminate or curb the need for packaging, by arranging products in different ways or condensing liquid formulas.					
f) Our firm is cooperating with vendors to use life cycle assessment to evaluate environmental impact of packaging during design and to standardize packaging					

	1	2	3	4	5
g) Our company is adopting systems that encourage returnable packaging methods.					

Fuel Efficiency Practices

6. Please indicate the extent to which the following practices are implemented in your organization.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

	1	2	3	4	5
a) We train drivers to practice driving techniques which are fuel efficient					
b) We ensure correct tyre maintenance to enhance fuel efficiency					
c) We use fuel efficient vehicles.					
d) We are implementing a continuous preventive maintenance program for our vehicles.					
e) We leverage technology (i.e. taking advantage of on-board diagnostics systems and new telematics) that aid in analysing fuel purchases and vehicle performance.					
f) We are integrating real-time visibility of inventory in the warehouses aimed at reducing unnecessary trips					
g) We have organized supplier consignments to combine freight costs and negotiate better rates and leverage multiple modes (e.g. use of railway line).					

Optimization of Routes Practices

7. Please indicate the extent to which the following practices are implemented in your organization.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

	1	2	3	4	5
a) Our organization does positioning in real-time using precise geo-coding (GPS) to present a map view of the current positions of vehicles, aiding the supervisor identify the driver closest to a new pickup job, the driver's proximity to a customer location and who can take the work a driver is unable to complete.					
b) Our firm directs drivers by automatically providing driving directions based on run sheet data to the trucks next stop.					
c) Our company provides a graphical view of the calls to a driver, re-calculating automatically the route when a driver selects a manual stop which is out-of-sequence.					
d) Our organization has statistics on driver and fleet to offer an enhanced level					

| | of understanding of fleets operational efficiency and help in pinpointing areas where costs can be reduced or improve productivity like in regrouping of goods. | | | | | |

Carbon Emissions Measurement Practices

8. Please indicate the extent to which the following practices are implemented in your organization.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

	1	2	3	4	5
a) Our company obtain from vehicle manufacturers a Life Cycle Assessment (LCA) showing the complete carbon emission from the vehicle assembly to its usage and its disposal.					
b) Our company has a purchased carbon offsets to compensate all carbon emissions caused by our vehicles e.g. tree planting.					
c) Our firm often replaces older vehicles with newer ones which emit less to the environment.					
d) For small consignments we use vehicles with less engine capacity or even motorbikes.					
e) Our firm's carbon emission report has all information needed for decision making by both the external and internal users.					
f) Our firm's carbon emission information is reported in a coherent, neutral and factual manner based on audit trail which is clear.					

Reverse Logistics Practices

9. Please indicate the extent to which the following practices are implemented in your organization.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

	1	2	3	4	5
a) Our company offers product vendors, the product recall or packaging return or take-back service					
b) Our firm makes customers aware of product recall service provided by the company					
c) Our organization provides logistics service for reusable containers to product vendors					
d) Our firm provides logistics service for on-site disposition					

e) Our company provides to product vendors, rework services for their returned products					
f) Our organization receives logistics services from a vendor for liquidation of returned products					
g) Our firm offers special incentives to those who return packaging materials.					
h) Our company provides suitable guidance to clients on the environmental aspects of handling, usage, and disposal of the vendor's products.					
i) Our firm returns used packaging and products to suppliers for recycling or reuse					
j) Our company offers consolidate freight in cases where used material and packaging is to be shipped back to the vendor.					

SECTION C: ENVIRONMENTAL PERFORMANCE

10. Please indicate the percentage reduction in the following environmental performance indicators that your firm has experienced in the last three years.

Environmental Impact	0-20%	21-40%	41-60%	61-80%	81-100%
a) Fume emissions					
b) Oil waste/Spillage.					
c) Solid waste reduction e.g. damaged/unusable vehicle parts.					
d) Amount of fuel used					
e) General quality of environment through reduced noise pollution					
f) Consumption of dangerous and toxic substance like usage of diesel for our vehicles.					

SECTION D: ECONOMIC PERFORMANCE

11. Please indicate the percentage reduction in the following economic performance indicators that your firm has experienced in the last three years.

Economic Impact	0-20%	21-40%	41-60%	61-80%	81-100%
a) Maintenance cost for our vehicles					

b) Cost of waste oil treatment					
c) Overall oil discharge fee					
d) Traffic accidents fine e.g. insurance premiums					
e) Overall fuel cost					

SECTION E: SOCIAL PERFORMANCE

12. Please indicate by ticking (√) in each of the following statements, the extent to which you perceive that your firm has achieved each of the following in the last three years.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

Social Impact	1	2	3	4	5
a) There has been a reduction in the number of road accidents caused by our vehicles.					
b) Offering logistical support in providing transport or storage to humanitarian aid organizations during emergency situations.					
c) Standing against human trafficking for purpose of labour.					
d) Payment of salaries that are above normal wage rate and adjusted for inflation.					
e) Improved employee job satisfaction.					
f) Enhanced safety and health of employees.					
g) Increase in the number of our long-distance truck drivers visiting road-side wellness centres that focus on infectious diseases and HIV.					
h) Improved Human Rights advocacy e.g. avoidance of child labour.					
i) Improved product responsibility e.g. Customer health and safety.					
j) Decrease in the number of our vehicles getting stuck in traffic Jams.					
k) Decrease in the number of corruption cases involving our company e.g bribery.					

SECTION F: FIRM PERFORMANCE

13. Please indicate by ticking (√) the extent to which you perceive that your firm has achieved each of the following in the last three years.

[1] Not at all [2] To a little extent [3] To a moderate extent [4] To a great extent [5] To a very great extent

Financial Perspective	1	2	3	4	5
a) Our firm's profitability has increase (on average) in the last three years.					
b) Our company has experienced revenue growth (on average) in the last three years.					
c) Our firm's return on assets has increased (on average) in the last three years.					
Customer Perspective	1	2	3	4	5
a) The number of items delivered on time to our customers (on average) has increased in the last three years.					
b) Number of items damaged on transit (on average) has reduced in the last three years.					
c) Our firm has experienced market share growth (on average) in the last three years					
Internal processes perspective	1	2	3	4	5
a) Our firm has been able to introduce new logistical services in the last three years.					
b) Our firm has increased capacity utilization e.g. optimal loading of our trucks in the last three years.					
c) Our firm has increased the number of logistical quality controls in the past three years.					
Learning and growth perspective	1	2	3	4	5
a) There has been an increase in the number of implemented innovations by our employees (on average) in the last three years.					
b) We have reduced rates of staff turnover (on average) in the last three years					
c) The productivity of our employees (on average) has increased in the last three years.					
d) The number of employees (on average) who are on self-education has increased in the last three years.					
e) The percentage of employees with higher education (on average) has increased in the last three years.					
f) The number of training courses attended by our employees (on average) has increased in the last three years.					

YOUR COOPERATION IS HIGHLY APPRECIATED

THANK YOU VERY MUCH

Appendix VIII: List of Selected Logistics Firms

1	ABER PAUL LIMITED	529	BATA SHOE COMPANY LIMITED	551	CARGOMAX LOGISTICS LTD
3	ACE FREIGHT LTD	45	BEDI INVESTMENTS LTD	90	CARRAMURE INTERNATIONAL
4	ACTS BUSINESS SYSTEMS	532	BEEKAY LOGISTICS LIMITED	93	CENTRAL CARGO SERVICES LTD
9	AFFAIRS AFRIQUE LTD	534	BEMMS LIMITED	96	CHANEL ATLANTIC LTD
504	AFRICALINK FORWARDERS LIMITED	47	BENAIRS LOGISTICS LTD	556	CHAP CHAP CLEARING & FORWARDING LTD
12	AFRIQFREIGHT SERVICES LTD	54	BIRDWELL VENTURES LTD	559	CHIBE FREIGHTERS LIMITED
20	AIRFREIGHT & LOGISTICS WORLD WIDE LTD	61	BLUEPLUS FREIGHTERS LTD	562	COAST PROFESSIONAL
506	AKL LOGISTICS LTD	63	BLUETIDE FREIGHT LOGISTICS	100	COMFY LOGISTICS LTD
510	ALFOST ENTERPRISE LIMITED	70	BORABU FREIGHT & TRANSPORT SERVICES	564	CONKEN CARGO FORWARDERS LIMITED
26	ALLIANCE LOGISTICS	72	BRIDGE LAND INTERNATIONAL	103	CONTINENTAL LOGISTICS NETWORK LTD
515	ALUJO ENTERPRISES	543	BRITEX ENTERPRISES CO. LTD	106	CORNERSTONE LTD
31	ANISA AGENCIES (K) LTD	74	BUCHERO ENTERPRISES	108	CORPORATE AVIATION LTD
34	ARAMEX KENYA LTD	76	BUYERS LOGISTICS LTD	109	CORPORATE LEGENDS LTD
523	ATACO FREIGHT SERVICES LIMITED	78	CANDID FREIGHTERS LTD	565	CORRUGATED SHEETS LIMITED
40	ATTIS LOGSOL LTD	79	CAR AND GENERAL LTD	110	COSMOS INT. LOGISTICS LTD
524	BAABZ FREIGHT FORWRDERS LTD	550	CARGODECK EA LIMITED	115	CRUCIAL CARGO MOVERS
525	BAHARI (T) COMPANY LIMITED	89	CARGOMASTERS E.A. LTD	116	CULZENBERG
527	BAKOL FREIGHTERS				
42	BAKRIZ HOLDINGS LTD				

119	FORWARDERS LTD DANSAF LOGISTICS		CARGO LOGISTICS LTD	169	FREIGHT CONSULTANTS LTD
569	DAP LOGISTICS LIMITED	140	ECU WORLDWIDE (K) LTD	170	FREIGHT IN TIME LTD
571	DAVKIT ENTERPRISES LIMITED	595	EDISA HOLDINGS (K) LIMITED	171	FREIGHT POWER LOGS. LTD
572	DECCAN FREIGHT LOGISTICS	142	EMPIRE LOGISTICS SERVICES LTD	172	FREIGHT REACH SERVICES
123	DEEPMARK CARGO LTD	144	EQUIRAK LOGISTICS LTD	173	FREIGHT SOLUTIONS
573	DEKAM FREIGHTERS LIMITED	599	ERIKAH MARITIME SERVICES LIMITED	174	FREIGHT WINGS LTD
578	DERRICKSON SYSTEMS LIMITED	601	ESTHAL LOGISTICS LIMITED	618	FREIGHTWELL EXPRESS LIMITED
127	DESTINY CONVERYORS	149	EXCELLENT LOGISTICS	176	FRESH GLOBAL LOGISTICS LTD
128	DESTINY FREIGHT SERVICES LTD	151	EXPOLANKA FREIGHT LTD	177	FREVA LOGISTICS SERVICES
129	DHL GLOBAL FORWARDING	607	EYEBLINK FREIGHT MANAGEMENT	619	FY SIMBA SHIPPING AGENTS LIMITED
130	DHL WORLDWIDE EXPRESS (K) LTD	155	FAIRWAYS CONSOLIDATORS	179	G.N CARGO KENYA
582	DODWELL & COMPANY (EA) LTD	610	FARIHMA TRADING COMPANY LIMITED	181	GARDEN FREIGHT LOGISTICS LTD
583	DON SIMON LIMITED	611	FASMU FREIGHT FORWARDERS LIMITED	622	GEMINI GLOBAL EXPRESS
585	DOTCOM CONSULTANTS LIMITED	159	FIRSTHAND CARGO HANDLERS LTD	623	GENERAL CARGO SERVICES LIMITED
586	DRENAL ENTERPRISES LIMITED	160	FLEET FREIGHTERS LTD	626	GIFCO KENYA LIMITED
137	DUKE EXPRESS E.A LTD	161	FLOWEPORT LOGISTICS (K) LTD	629	GLOBAL CARGO MOVERS LIMITED
590	EAST AFRICA	162	FLOWERWINGS EXPRESS (K) LTD	187	GLOBAL FREIGHT LOGISTICS LTD
		167	FRANK & GEOFFREY CARGO LTD	631	GOLDEN FREIGHT SERVICES LIMITED
				632	GOLDWELL FORWARDERS LIMITED

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190	GOODMAN INTERNATIONAL LTD	LTD
633	GREATSPAN MARITIME SERVICES LIMITED	647 INTERFACE AGENCIES LIMITED
634	GREENBELT LOGISTICS LIMITED	215 INTERGRATED LOGISTICS CO. LTD
635	GREENLEAF TRADING COMPANY LTD	648 INTERKEN ENTERPRISES INTERNATIONA
637	HAMBUFREIGHT SERVICES LTD	216 COMMERCIAL CO. LTD
638	HANGOOL INVESTMENT GROUP LTD	650 ISSA CLEARING & FORWARDING LIMITED
639	HANSOL LOGISTICS (K) LTD	227 JAY AND JAY LOGISTICS LTD
196	HIGHLANDS FORWARDERS	228 JEDIMA TRADE AGENCIES LTD
198	HOMELAND FREIGHT LTD	655 JIHAN FREIGHTERAS LIMITED
199	HORIZON EXPRESS CO. LTD	231 JIRES LTD
200	HORIZON FREIGHT FORWARDERS LTD	657 JMK ENTERPRISES LIMITED
203	IMPEX FREIGHT LTD	658 JOKIVIEW GENERAL (K) LIMITED
644	INCOTERMS LOGISTICS SOLUTIONS LIMITED	660 JONPHIX FREIGHT SERVICES LIMITED
206	INDEX CARGO LOGISTICS LTD	661 JOPALM CLEARING & FORWARDING LIMITED
209	INSPIRE CARGO LOGISTICS LTD	664 JOWAK AGENCIES LIMITED
212	INSTANT SOLUTIONS	233 JOWAKA SUPER LINKS LTD
213	INTER LOGISTICS	235 JUATECH AGENCIES

Column 3:

COMPANY LIMITED

668 KAABA INVESTMENTS LIMITED

241 KEARSLEY FREIGHT SERVICES LTD

675 KENFREIGHT EA LIMITED

244 KENTON FREIGHTERS

245 KENYA DUTY FREE COMPLEX

247 KENYA VEHICLES MANUFACTURERS LTD

250 KEYNAUGHT LOGISTICS LTD

253 KIAMBA C & F LTD

683 KIMM FREIGHTERS (K) LTD

684 KIMNET AGENCIES LTD

685 KIMU FREIGHT AGENCIES LTD

255 KINGS CARGO AGENCIES LTD

688 KODAVI INVESTMENTS LIMITED

691 LAXAT TRADERS LIMITED

261 LIFT CARGO

262 LINK AFRIQUE KENYA

263 LINO STATIONERS K. LTD

699 LIVERCOT IMPEX

665 JUBILEE C&F (E.A) LTD

666 JUWELLS TRADING

#	Company	#	Company	#	Company
	LIMITED	730	MOLO FREIGHTERS LIMITED	754	PACMA INVESTMENT LTD
700	LLOYDS LOGISTICS LIMITED	734	MONSOON MOVERS LTD	760	PAN AFRICAN SYNDICATE LIMITED
264	LOGENIX INTERNATIONAL	735	MORNING GLORY FREIGHT SERVICES LTD	762	PANAL FREIGHTERS LIMITED
265	LOGISTIC FREIGHT LIMITED	739	MUSTAFA MOHAMED ISSA LTD	334	PANTEL CHEMICALS LTD
707	M.J CLARKE LIMITED	305	MWANDO LOGISTICS	337	PEJON FREIGHT MOVERS LTD
271	MACSIM CARGO SERVICES LTD	306	NAASH AFRICA LOGS. LTD	340	PHILSAM AGENCIES LTD
712	MAGNEX LIMITED	311	NAS AIRPORT SERVICES LTD	341	PILLAR FREIGHT FORWARDERS
714	MAK CARGO HANDLING SERVICES LTD	312	NATIONA MEDIA GROUP	342	PINNACO LOGISTICS LTD
275	MANUFACTURERS & SUPPLIERS LTD	318	NOASHS ARK ENTERPRISES	345	PLANSFREIGHT LTD
717	MAR-FRONTIER KENYA LTD	746	NORTHWEST KENYA	346	POLYGON LOGISITCS LTD
718	MARITIME FREIGHT LTD	320	NYAGAKA FORWARDERS LTD	348	PORTAL CORPORATION
280	MARKS ENTERPRISES LTD	749	OCEANROCK LOGISTICS LIMITED	349	PORTWAY E.A. LTD
723	MARYMAC FREIGHT CO LTD	750	OCEANWORLD LOGISTICS LIMITED	770	PORTWOXS CARGO FORWARDERS LTD
282	MASTERPIECE COURIER S. LTD	751	OGAKA FREIGHT LOGISTICS LTD	350	PRECISE LOGISTICS LTD
285	MENENGAI OIL REFINERY LTD	326	ONE ON ONE LOGISTICS LTD	351	PRIM CARGO LTD
726	MENHIR LIMITED	327	ONE TOUCH CARGO SERVICES	352	PRIORITY AIR EXPRESS LTD
288	MID OCEAN LTD	328	ONE TOUCH LOGISTICS LTD	772	PROVINCIAL CLEARING & FORWARDING
289	MID-AFRICA SERVICES LTD	331	OPTIMAX KENYA LTD	775	QUICKLINE INTERNATIONAL LIMITED
291	MIG FORWARDERS LTD	753	P.N.MASHRU LTD	777	RABI AGENCY
294	MOHABAB ENTERPRISES				

	LIMITED		LIMITED		LTD
364	RED ANCHOR FREIGHT LTD	806	SEAGATE LOGISTICS LIMITED	421	SPERANZA INTERNATIONAL
366	REGIONAL ENTERPRENEURS (K) LTD	394	SEATEC GLOBAL LOGISTICS	837	STARWAY INTERNATIONAL FREIGHT & FORWADERS LTD
367	RELAY CARGO SERVICES LTD	400	SHAMCO LOGISTICS INTERNATIONAL LTD	429	SUNTRON INVESTMENTS LTD
784	REPLAN CARGO HANDLING SERVICES	814	SHIPFREIGHT LOGISTICS LIMITED	841	SUNTRON INVESTMENTS LTD
785	RIANAB LOGISTICS LIMITED	816	SIGINON FREIGHT LIMITED	432	SUPERFREIGHT LTD
372	RICHENS LOGISTICS LTD	818	SILVER ANCHOR FREIGHTERS LIMITED	435	SUPERSONIC CLEARING & FORWARDING LTD
373	RIFT CARGO HANDLING LTD	403	SILVER SILICON LTD	437	SUPERSONIC FREIGHTERS (K) LTD
786	RIPE FREIGHT SERVICES LIMITED	820	SIMBA APPARELS (EPZ) LTD	438	SUZAN DUTY FREE
376	RISING FREIGHT LTD	404	SIMMUHDS CARGO SERVICE LTD	843	SYLLER IMPRESS COMPANY LIMITED
787	ROBIAM CARGO FREIGHTERS LTD	408	SKYLARK CONVEYORS (K) LTD	439	TABAKI FREIGHT SERVICES INTERNATIONAL LTD
378	ROMARK FREIGHTERS LTD	409	SKYLIFT CARGO LTD	845	TAMANYA FREIGHT & LOGISTICS SERVICES LTD
788	ROMAX FORWARDERS LTD	413	SKYWAYS LOGISTICS LTD		
380	RUKANOTI WOOD DEALER LTD	824	SMART CHOICE SERVISES LIMITED	447	TOPLINE LOGISTICS LTD
791	RUMAN LIMITED	417	SONIC FRESH COMPANY	448	TOTAL TAOUCH EXPRESS
796	SAFREIGHT LIMITED	830	SONYA EXPORTS & IMPORTS AGENCIES LTD	851	TRADELINK LOGISTICS LIMITED
384	SAHARRY LTD				
801	SASI INTERNATIONAL FREIGHT LOGISTICS LIMITED	833	SPEAR LOGISTICS (K) LTD	452	TRADEWISE AGENCIES (K) LTD
804	SEACON KENYA	420	SPEEDEX LOGISTICS	853	TRANSAFRICA LOGISTICS LTD

453	TRANSCARE SERVICES LTD		COMPANY LIMITED		VISHAMMAH
457	TRANSONIC PROJECT DEVELOPMENT (K) LTD	469	UNITED FREIGHT LOGISTICS	882	ENTERPRISES LIMITED
461	UCHALE LOGISTICS LTD	870	UTILITY FREIGHT LOGISTICS LIMITED	884	WAMBUKA FREIGHTERS LIMITED
863	UNEECO PAPER PRODUCTS LTD	871	UTMOST FREIGHT MASTERS LIMITED	481	WARTON AGENCIES
464	UNICK COMPANY LTD	874	VENUS (K) LIMITED	887	WETAA INVESTMENTS LTD
466	UNION LOGISTICS CO. LTD	472	VERODAH FREIGHTERS & LOGISTICS LTD	889	WIGGLESWORTH EXPORTERS LIMITED
467	UNION LOGISTICS LTD	878	VIBRASI ENTERPRISES LIMITED	483	WILCKO FREIGHT SERVICES LTD
866	UNITED (EA) WAREHOUSES LTD	879	VICTORY FREIGHT SERVICES	890	WILJONES LOGISTICS LTD
468	UNITED ARYAN EPZ LTD	474	VICTORY FREIGHTERS		
867	UNITED CLEARING	880	VILLESSY AGENCY		
		881	VISAN FREIGHT AGENCIES		

Appendix IX: List of Logistics Firms

295	MOMO CLEARING & FORWARDING CO. LTD	679	PORTLINK LOGISTICS LIMITED	430	SUPERCARE FREIGHT SERVICE LTD
54	BIRDWELL VENTURES LTD	696	LINKAGE CONVEYORS LIMITED	95	CHANDARIA INDUSTRIES LTD
231	JIRES LTD	49	BESTFAST CARGO	35	ARBITERS ENTERPRISES LTD
190	GOODMAN INTERNATIONAL LTD	711	MACKENZIE MARITIME FORWARDERS LTD	392	SEABRIDGE FORWARDERS LTD
219	INTIME FREIGHT CARGO LTD	552	CARIBBEAN FREIGHT LIMITED	820	SIMBA APPARELS (EPZ) LTD
646	INSPIRE AFRICA LOGISTICS LTD	629	GLOBAL CARGO MOVERS LIMITED	245	KENYA DUTY FREE COMPLEX
41	AZUSA LIMITED	304	MUSTAFA FREIGHT FORWARDERS LTD	129	DHL GLOBAL FORWARDING
750	OCEANWORLD LOGISTICS LIMITED	306	NAASH AFRICA LOGS. LTD	14	AGILITY LOGISTICS LTD
119	DANSAF LOGISTICS	286	MENTAP RESOURCES FREIGHT LTD	193	HASS PETROLEUM (K) LTD
434	SUPERQUICK FREIGHTERS LTD	291	MIG FORWARDERS LTD	472	VERODAH FREIGHTERS & LOGISTICS LTD
179	G.N CARGO KENYA	72	BRIDGE LAND INTERNATIONAL	2	ACCELER GLOBAL LOGS. LTD
566	CRISPOL E.A LTD	594	ECS LOGISTICS K LIMITED	708	MACA TRADING COMPANY LIMITED
777	RABI AGENCY LIMITED	349	PORTWAY E.A. LTD	530	BAYLAND FREIGHT AGENCIES LIMITED
214	INTERCITIES FREIGHT & SHIPPING LTD	790	ROSMIK TRADING COMPANY LIMITED	803	SEABASE SOLUTIONS LIMITED
455	TRANSOCEANIC PROJECT DEV. (K) LTD	241	KEARSLEY FREIGHT SERVICES LTD	663	JORDAN FREIGHTERS LTD
784	REPLAN CARGO HANDLING SERVICES	145	EREMO STORES LTD	588	DUNIYA FORWARDERS LTD
867	UNITED CLEARING COMPANY LIMITED	436	SUPERSONIC CLEARING & FORWARDING LTD	613	MAGOT FREIGHT SERVICES LTD
310	NAJMI CLEARING & FORWARDING LTD	738	MULTIPLE SOLUTIONS LIMITED	171	FREIGHT POWER LOGS. LTD
813	SHELTER CONVEYORS LTD	630	GMK EAST AFRICA LIMITED	863	UNEECO PAPER PRODUCTS LTD
519	AMEY TRADING COM. LTD	173	FREIGHT SOLUTIONS	267	LOGWIN AIR & OCEAN K. LTD
540	BLUE LIME LIMITED	514	ALPINE TRADING LIMITED	387	SALIMOND FREIGHT SERV.
159	FIRSTHAND CARGO HANDLERS LTD	505	AIR MENZIES INTERNATIONAL	868	UNIVERSAL FREIGHTERS LIMITED
480	WANSAR ENTERPRISES LTD	553	CARMEL MOUNT FREIGHT (K) LIMITED	462	UKWALA FREIGHT FORWARDERS
287	METEOR FREIGHT FORWARDERS LTD	617	FREIGHTCARE LOGISTICS LIMITED	670	KAISER AGENCIES LIMITED
560	CHWILE INVESTMENT LIMITED	50	BESTFREIGHT CONVEYORS LTD	475	VINEP FORWARDERS LTD
358	RAMSFORD FREIGHT FORWARDERS LTD	521	ARNOP LOGISTICS COMPANY LIMITED	795	SAFELANDING LOGISTICS LIMITED
100	COMFY LOGISTICS LTD	140	ECU WORLDWIDE (K) LTD	9	AFFAIRS AFRIQUE LTD
337	PEJON FREIGHT MOVERS LTD	227	JAY AND JAY LOGISTICS LTD	141	EMASA KENYA CLEARING & FORWARDING LTD
332	OSERIAN DEVELOPMENT CO. LTD	69	BOON TRADE AGENCIES LTD	421	SPERANZA INTERNATIONAL
587	DSV AIR AND SEA LIMITED	125	DELTA CARGO CONNECTIONS	486	WILLMAN FREIGHT AGENCIES
724	MATRIX FREIGHT LOGISTIC	154	FAIDA CARGO SERVICES LTD	864	UNIMAR LOGISTICS LIMITED
42	BAKRIZ HOLDINGS LTD	165	FOX INTERNATIONAL LOGISTICS LTD	59	BLUE SEAL FREIGHTERS LTD
461	UCHALE LOGISTICS LTD	111	CROSS BORDER CARGO LTD	697	LINKFREIGHT (EA) LIMITED
856	TRANSMAX KENYA LIMITED	25	ALL SCOPE LOGISTICS LTD	126	DELTA HANDLING SERVICES LTD
364	RED ANCHOR FREIGHT LTD	821	SIVORINE (K) LIMITED	446	TIMSALES LIMITED
529	BATA SHOE COMPANY LIMITED	273	MAGNETIC KENYA LTD	615	FOOD CHAIN (E.A) LTD
92	CEBIT CARGO LTD	744	NEEMA PARCELS LIMITED	607	EYEBLINK FREIGHT MANAGEMENT
728	MITCHELL COTTS FREIGHT KENYA LIMITED	258	LANDMARK PORT CONVEYORS LTD	699	LIVERCOT IMPEX LIMITED
494	ZANAA FREIGHT LIMITED	185	GIRAFFE FORWARDERS LTD	34	ARAMEX KENYA LTD
284	MAYA DUTY FREE	515	ALUJO ENTERPRISES	407	SKYFREIGHT LOGISTICS
327	ONE TOUCH CARGO SERVICES	483	WILCKO FREIGHT SERVICES LTD	128	DESTINY FREIGHT SERVICES LTD
507	AL SHOG SYSTEMS LIMITED	787	ROBIAM CARGO FREIGHTERS LTD	880	VILLESSY AGENCY
89	CARGOMASTERS E.A. LTD	61	BLUEPLUS FREIGHTERS LTD	668	KAABA INVESTMENTS LIMITED

527 BAKOL FREIGHTERS	47 BENAIRS LOGISTICS LTD	83 CARGO CONVEYORS LTD
683 KIMM FREIGHTERS (K) LTD	644 INCOTERMS LOGISTICS SOLUTIONS LIMITED	710 MAK CARGO HANDLING SERVICES LTD
785 RIANAB LOGISTICS LIMITED	88 CARGOMANIA LTD	786 RIPE FREIGHT SERVICES LIMITED
693 LIBAAN LIMITED	676 KENKAL SHIPS & GENERAL CONTRACTORS LTD	365 CORRUGATED SHEETS LIMITED
87 CARGO WORLD CONVEYORS	435 SUPERSONIC CLEARING & FORWARDING LTD	524 BAABZ FREIGHT FORWRDERS LTD
767 PICKET LOGISTICS LIMITED	503 AERO MARINE CARGO SERVICES LIMITED	753 P.N.MASHRU LTD
360 RAY CARGO SERVICES LTD	311 NAS AIRPORT SERVICES LTD	123 DEEPMARK CARGO LTD
335 PANWORLD LOGISTICS	752 OZONE FREIGHT FORWARDERS LTD	414 SMOOTHLINE FREIGHTERS LTD
104 CONVENTIONAL CARGO CONVEYORS LTD	659 JONERICS CARGO FORWARDERS	356 RAHMA LOGISTICS LTD
454 TRANSNET FREIGHT INTERNATIONAL LTD	225 JASPA LOGISTICS	440 TANDEM SOLUTIONS LTD
109 CORPORATE LEGENDS LTD	7 ADROIT LOGISTICS LIMITED	649 INTERSCOPE AIRMARITIME LOGISTICS LTD
268 LONGRANGE TRADING	103 CONTINENTAL LOGISTICS NETWORK LTD	858 TURNER FREIGHTERS LTD
40 ATTIS LOGSOL LTD	703 LOGISTICS THREE SIXTY FIVE LIMITED	285 MENENGAI OIL REFINERY LTD
802 SAWA INTERNATIONAL LIMITED	252 KEYWAVE LOGISTICS	534 BEMMS LIMITED
26 ALLIANCE LOGISTICS	516 AL-YUM HAULIERS LIMITED	262 LINK AFRIQUE KENYA
759 PAMU SERVICES	37 ARNET CONSULT E.A. LIMITED	202 IMPERIAL CARGO INTERNATIONAL
792 RUMEYSA FREIGHT LIMITED	325 ONE LINK LTD	662 JORA LOGISTICS LTD
606 EXPORT CONSOLIDATION SERVICES	487 WOLFENBERG INTERNATIONAL LTD	564 CONKEN CARGO FORWARDERS LIMITED
611 FASMU FREIGHT FORWARDERS LIMITED	556 JIJI EAST AFRICA LIMITED	420 SPEEDEX LOGISTICS LTD
182 GEFSONS CLEARING & FORWARDING	549 CARGO MOVERS LIMITED	685 KIMU FREIGHT AGENCIES LTD
56 BLITZ LOGISTICS LTD	425 STERNER LOGISTICS	162 FLOWERWINGS EXPRESS (K) LTD
96 CHANEL ATLANTIC LTD	638 HANGOOL INVESTMENT GROUP LTD	114 CROWN INDUSTIRES LTD
700 LLOYDS LOGISTICS LIMITED	208 INDUS LOGISTICS LD	523 ATACO FREIGHT SERVICES LIMITED
639 HANSOL LOGISTICS (K) LTD	212 INSTANT SOLUTIONS	623 GENERAL CARGO SERVICES LIMITED
695 LIMUTTI HOLDINGS LIMITED	718 MARITIME FREIGHT LTD	836 SPRING LOGISTICS LIMITED
413 SKYWAYS LOGISTICS LTD	406 SKY AND SEA CARGO TRACK LTD	851 TRADELINK LOGISTICS LIMITED
634 GREENBELT LOGISTICS LIMITED	81 CARES CLEARING & FORWARDING CO. LTD	18 AIRBAND CARGO FORW. LTD
801 SASI INTERNATIONAL FREIGHT LOGISTICS LIMITED	655 REGENT FREIGHT SYSTEMS LTD	139 EAST AFRICAN CHAINS LTD
432 SUPERFREIGHT LTD	584 DOSHI & COMPANY(HARDWARE) LIMITED	160 FLEET FREIGHTERS LTD
74 BUCHERO ENTERPRISES	640 HARLS CARGO LOGISTICS LIMITED	183 GENERAL FREIGHTERS LTD
533 BELYNE FREIGHTERS & LOGISTICS	281 MASCOT HOLDINGS LTD	443 TEPRA LOGISTICS LTD
226 JASPER FREIGHT LTD	702 LOGISTICS SOLUTIONS LTD	879 VICTORY FREIGHT SERVICES
164 FOCUS INITITIVES IMPORT	199 HORIZON EXPRESS CO. LTD	51 BEYOND AFRICA FREIGHTERS LTD
149 EXCELLENT LOGISTICS	203 IMPEX FREIGHT LTD	394 SEATEC GLOBAL LOGISTICS
228 JEDIMA TRADE AGENCIES LTD	883 WAKULIMA AGRIBUSINESS	137 DUKE EXPRESS E.A LTD
628 GLOBAL BUSINESS COMMANDERS LTD	648 INTERKEN ENTERPRISES	513 ALLPORTS KENYA LIMITED
760 PAN AFRICAN SYNDICATE LIMITED	117 DAMASA FREIGHT FORWARDERS LTD	243 KENAFRIC INDUSTRIES LTD
546 CAPRICORN FREIGHT FORWARDERS LIMITED	621 GATEWAY MARINE SERVICES LTD	143 ENERLOG LIMITED
848 TELLAM FREIGHT FORWARDERS LTD	797 SAHA FREIGHTERS COMPANY LIMITED	478 WAKI CLEARING & FORW. A. LTD
725 MBARAKI PORT WAREHOUSES (K) LIMITED	31 ANISA AGENCIES (K) LTD	844 TALLIENT LOGISTICS LIMITED
343 PLAINLANDS INTER FREIGHT LOGISTICS LTD	754 PESOSI FREIGHTERS LIMITED	33 APPLE LOGISTICS LTD
847 TATU LIMITED	346 POLYGON LOGISITCS LTD	195 HI- TECH IMPEX LTD
466 UNION LOGISTICS CO. LTD	354 QUEENS CARGO INTERNATION LTD	819 SILVERHAWK CARGO LTD
727 MERCICO LIMITED	63 BLUETIDE FREIGHT LOGISTICS	860 UFANISI FREIGHTERS
548 CARGO (EA) LIMITED	729 MNET STARS LIMITED	545 BULK TRADING (K) LTD
235 JUATECH AGENCIES	694 LILY LOGISTICS LIMITED	799 SAHUSA FREIGHTERS LTD

579	DHANUSH FORWARDERS (K) LTD	411	SKYLINE GLOBAL SERVICES LTD	765	PETROSA GENERAL CONTRACTORS LTD
474	VICTORY FREIGHTERS	244	KENTON FREIGHTERS	158	FILMLINE LTD
798	SAHEL FREIGHTERS LIMITED	558	CHARLETON AGENCIES LIMITED	568	DANJAM INVESTMENTS COMPANY LIMITED
448	TOTAL TAOUCH EXPRESS	622	GEMINI GLOBAL EXPRESS	862	UNDERSEAS MERCHANTS
22	AIRWAGON CARGO MOVERS LTD	52	BIGWAYS LTD	701	LOGISTICS SERVICES LIMITED
686	KIPKEBE LIMITED	807	SEALINE FORWARDERS LIMITED	809	SEATEL INVESTMENTS LTD
791	RUMAN LIMITED	627	GLADIN LOGISTICS (K) LIMITED	833	SPEAR LOGISTICS (K) LTD
136	DORTAL SERVICES LTD	269	LONGROAD LOGISTICS LTD	581	DIVERSE CARGO MARINE & AIR C&F SERVICES
236	KANKAM EXPORTERS LTD	314	NELINE SHIPPING &LOGISTICS ENT. LTD	576	DELTA EXPRESS LIMITED
525	BAHARI (T) COMPANY LIMITED	21	AIRMARINE AND LAND TRADING LTD	115	CRUCIAL CARGO MOVERS
451	TRADEWINDS LOGISTICS	647	INTERFACE AGENCIES LIMITED	642	HEROS COMPANY LIMITED
492	YEAR 2000 FREIGHTERS	775	QUICKLINE INTERNATIONAL LIMITED	704	LOW SEA INTERNATIONAL AGENCIES LTD
499	ABSOLUTE FREIGHT & LOGISTIC LTD	386	SALAAH FREIGHT SERVICES	166	FRAMIC CARGO AGENCIES LTD
870	UTILITY FREIGHT LOGISTICS LIMITED	828	SOLSON CLEARING COMPANY	570	DAVELINE NETWORK COMPANY LIMITED
599	ERIKAH MARITIME SERVICES LIMITED	502	ADMIRAL CARGO CONCEPT LIMITED	409	SKYLIFT CARGO LTD
722	MARYDAVID INVESTMENTS LTD	78	CANDID FREIGHTERS LTD	175	FREIGHTSORE AGENCIES LTD
302	MULTIPACKAGING LTD - PRINTPA	484	WILLIMA ENTERPRISES LTD	377	ROLLING CARGO LTD
772	PROVINCIAL CLEARING & FORWARDING	130	DHL WORLDWIDE EXPRESS (K) LTD	747	OCEAN PACIFIC INTERNATIONAL LTD
15	AGS WORLDWIDE MOVERS LTD	496	A.M.A AL AMMARY LTD	600	ERI-KENYA LIMITED
368	REMARC LOGISTICS	592	EBMAR INVESTMENTS COMPANY LTD	272	MAGNATE LOGISTICS LTD
86	CARGO PLAN MOVERS & FORWARDERS	518	AMBERTO AGENCIES LIMITED	17	AIR SEA LOGISTICS LIMITED
793	S & L PORT SOLUTIONS LTD	419	SOUTHLINK SERVICES LTD	98	CHEM LABS LTD
85	CARGO NEWS EXPRESS LTD	156	FANTASH FREIGHTERS & LOGISTICS	324	OKAMOTO FREIGHT SERVICES LTD
605	EXCELLENT SERVICES FREIGHTERS LIMITED	297	MONTERA CARGO LTD	804	SEACON KENYA LIMITED
849	TIDAL LOGISTICS LIMITED	481	WARTON AGENCIES	399	SHABA AFRICA LOGISTICS
774	QUICK MOVERS (K) LTD	488	WORLD CLASS FREIGHT LOGISTICS LTD	447	TOPLINE LOGISTICS LTD
204	IMPEX LOGISTICS	338	PENTAGON LOGISTICS LTD	107	CORONET CARGO LTD
482	WATER FRONT ENTERPRISES	815	SIDOMAN INVESTMENT LIMITED	590	EAST AFRICA CARGO LOGISTICS LTD
112	CROSS BORDER NETWORKS LTD	372	RICHENS LOGISTICS LTD	643	HYGIENE AFRICA LIMITED
837	STARWAY INTERNATIONAL FREIGHT & FORWARDERS LTD	102	DARBY WORLD FREIGHTERS	410	SKYLINE EXPRESS SERVICES LTD
395	SEAWAYS (K) LTD	348	PORTAL CORPORATION	223	JAMBO LOGISTICS E.A.
577	DENALI LOGISTICS LIMITED	756	PALLET LOGISTICS LIMITED	526	BAHARI FORWARDERS LTD
13	AFRIQUE SHIPPING SERVICES	144	EQUIRAK LOGISTICS LTD	118	DANROS (K) LTD
770	PORTWOXS CARGO FORWARDERS LTD	106	CORNERSTONE LTD	737	MULTCARGO FREIGHTERS LIMITED
80	CARE LOGISTICS KENYA	574	DELMONTE KENYA LIMITED	347	PORT CONVEYORS LTD
450	TRADELINE LOGISTICS LTD	657	JMK ENTERPRISES LIMITED	53	BIMA CLEARING & FORWARDING LTD
536	BEYOND CHANCE FREIGHTERS	684	KIMNET AGENCIES LTD	583	DON SIMON LIMITED
827	SOLLATEK ELECTRONICS (K) LTD	602	EUGFAVOUR LOGISTICS SOLUTION LIMITED	339	PHIL LOGISTICS CO
498	ABBAS TRADERS LTD	532	BEEKAY LOGISTICS LIMITED	255	KINGS CARGO AGENCIES LTD
852	TRANLINK LOGISTICS LIMITED	517	AMARANTHA AGENCY LTD	330	ONWARD CARGO SYSTEMS C. LTD
698	LINKON INVESTEMETS LIMITED	229	JEMI FREIGHT LTD	476	VISION ENTERPRISES LTD
240	KAWAISON INTERNATIONAL LTD	650	ISSA CLEARING & FORWARDING LIMITED	578	DERRICKSON SYSTEMS LIMITED
458	TRASPORTS LIFTING SEVICES LTD	1	ABER PAUL LIMITED	75	BURHANI EXPRESS LOGISTICS LTD
131	DIGITAL CARGO FORWARDERS LTD	233	JOWAKA SUPER LINKS LTD	177	FREVA LOGISTICS SERVICES
850	TRADE HAUS & GLOBAL LOGISTICS	891	WORLD CLASS ENT. CO.LTD	167	FRANK & GEOFFREY CARGO LTD
113	CROSS OCEAN LIMITED	857	TRIBERTOO (K) LIMITED	613	FIBER FREIGHT FORWARDERS

677	KENMONT LOGISTICS LIMITED	342	PINNACO LOGISTICS LTD	763	PEERLESS TEA SERVICES LIMITED
317	NEW WIDE GARMENTS KENYA EPZ	105	CONVENTIONAL CARGO CONVEYORS LTD	814	SHIPFREIGHT LOGISTICS LIMITED
768	POLO AUTOFREIGHT FORWARDERS LIMITED	288	KARSIS GLOBAL LOGISTICS LTD	712	MAGNEX LIMITED
316	NEOSERVE LOGISTICS LTD	315	NEO SEALAND REGIONAL FREIGHTERS LTD	393	SEALINE LOGISTICS LTD
224	JAMUSA ENTERPRISES LTD	528	BAMBURI SHIPCHANDLERS (KENYA) LIMITED	437	SUPERSONIC FREIGHTERS (K) LTD
318	NOASHS ARK ENTERPRISES	266	LOGISTIC LINK	8	AEROPATH KENYA LTD
294	MOHABAB ENTERPRISES	251	KEYNOTE LOGISTICS LTD	11	AFRICAIR MANAGEMENT & LOGISTICS
805	SEACREST LOGISTICS SOLUTION (K) LIMITED	456	SUPERFIRST FORWARDERS LTD	253	KIAMBA C & F LTD
652	JAMBO TRADERS LIMITED	259	LEADTIME CARGO LOGISTICS	79	CAR AND GENERAL LTD
736	MTAPANGA AGENCIES LIMITED	417	SONIC FRESH COMPANY	5	ADAIR FREIGHT SERVICES
739	MUSTAFA MOHAMED ISSA LTD	593	ECHKEN AGENCIES	301	MULLER LOGISTICS LTD
366	REGIONAL ENTERPRENEURS (K) LTD	843	SYLLER IMPRESS COMPANY LIMITED	20	AIRFREIGHT & LOGISTICS WORLD WIDE LTD
491	WOW BEVERAGES LTD	77	CALLFAST SERVICES LTD	307	NAFAST LTD
464	UNICK COMPANY LTD	336	PEDWIN LTD	381	RUSINGA INTERNATIONAL
184	GIBRON LIMITED	370	RENAISSANCE LIMITED	692	LEENA APPARELS LTD
39	ATLANTIC LOGISTICS INTERNATIONAL LTD	132	DIKENS LOGISTICS LTD	361	REAL DREAM INT. LTD
168	FREIGHT COMMANDOS LTD	362	REALTIME CARGO LTD	178	FRONTIER LINKS CO.LTD
831	SOUTHERN SHIPPING SERVICES LIMITED	55	BLINK LOGISTICS LTD	537	BILDAD ENTERPRISES LIMITED
261	LIFT CARGO	152	EXPORT TRADING LTD	811	SHAQSHAN FREIGHT LIMITED
825	SMART TRADERS LTD	871	UTMOST FREIGHT MASTERS LIMITED	389	SAM AND SAN LOGISTICS
16	AIR CONNECTION LTD	76	BUYERS LOGISTICS LTD	885	WAY TO ASSOCIATES LIMITED
207	INDEX CARGO LOGISTICS LTD	463	UNAMAK COMPANY LTD	205	IN TIME FORWARDERS LTD
672	KAMANGA FREIGHT SERVICES LTD	709	MACFREIGHT FORWARDERS CO. LTD	751	OGAKA FREIGHT LOGISTICS LTD
326	ONE ON ONE LOGISTICS LTD	625	GEORINE AGENCIES LTD	834	SPECIAL COLLECTION SERVICES
832	SPART FREIGHT LOGISTICS LIMITED	509	AL-EMIR LIMITED	717	MAR-FRONTIER KENYA LTD
415	SONDDEKA FREIGHT FORWARDERS LTD	4	ACTS BUSINESS SYSTEMS	257	LABORATORY & ALLIED LTD
460	TYKE LOGISTICS	573	DEKAM FREIGHTERS LIMITED	667	K.B FREIGHTERS LIMITED
201	ICEBERG MOVERS ENTERPRISES LTD	555	CHAI TRADING COMPANY LIMITED	735	MORNING GLORY FREIGHT SERVICES LTD
357	RAI PLYWOODS K LTD	188	GLOBAL REACH LOGISTICS LTD	658	JOKIVIEW GENERAL (K) LIMITED
826	SOKOTA INVESTMENTS LTD	234	JOWAM CARGO CO. LTD	218	INTERSPEED LOGISTICS LTD
716	MARAKIB FREIGHTERS LTD	6	ADONAI TRADING & LOGISTICS LTD	408	SKYLARK CONVEYORS (K) LTD
471	UTEX FREIGHT SERVICES LTD	637	HAMBUFREIGHT SERVICES LTD	19	AIRCOM CARGO LOGISTICS
776	QUISSAN ENTERPRISES LTD	151	EXPOLANKA FREIGHT LTD	424	STELLAR LOGITSICS LTD
91	CATESAM ENTERPRISES LTD	275	MANUFACTURERS & SUPPLIERS LTD	854	TRANSFREIGHT LOGISTICS LIMITED
740	MUZDALIFA CLEARING & FORWARDING CO. LTD	669	ADMUSS FREIGHT LOGISTICS LIMITED	274	MAKIWANI LOGISTICS LTD
124	DELFAST LOGISTICS	543	BRITEX ENTERPRISES CO. LTD	598	EMOTEL KENYA LIMITED
585	DOTCOM CONSULTANTS LIMITED	624	GEOMWA EXPRESS CARGO LTD	388	SALMAR CLEARING & FORWARDING LTD
290	MIDWAVE FREIGHTERS LTD	84	CARGO NEST (K) LTD	886	WESTON LOGISTICS LIMITED
93	CENTRAL CARGO SERVICES LTD	197	HIMA FREIGHT FORWARDERS LTD	209	INSPIRE CARGO LOGISTICS LTD
675	KENFREIGHT EA LIMITED	723	MARYMAC FREIGHT CO LTD	90	CARRAMURE INTERNATIONAL
761	PANAFRICA LOGISTICS LIMITED	741	MWANGO CLEARING INVESTMENTS LIMITED	28	ALPHA IMPEX LOGISTICS INT LTD
766	PETRUT FREIGHT FORWARDRS LTD	271	MACSIM CARGO SERVICES LTD	254	KIND LOGISTICS LTD
373	RIFT CARGO HANDLING LTD	278	MARGIE AGENCIES	174	FREIGHT WINGS LTD
150	EXPIDITE LOGISTICS LTD	651	JAGOMA LOGISTICS	276	MARACA ENTERPRISES
300	MUCHEBA SERVICES	299	MOVE AND PICK	619	FY SIMBA SHIPPING AGENTS LIMITED
94	CHAIRMANS HOLDINGS	636	GULF CROSS LTD	660	JONPHIX FREIGHT SERVICES LIMITED

No.	Name	No.	Name	No.	Name
595	EDISA HOLDINGS (K) LIMITED	230	JIPE HOLDINGS LTD	542	BRANDED FINE FOODS LTD
794	S.K AMIN LIMITED	673	KANNON C&F LTD	743	NEBULA CONVEYORS LIMITED
369	REMOVAL GOODS SERVICES (K) LTD	835	SPEDAG INTERFREIGHT KENYA LIMITED	62	BLUERANGE LOGISTICS LTD
859	TURNING POINT FREIGHT LTD	779	RANK NETWORK & LOGISTICS LTD	344	PLAINS LOGISTICS LTD
248	KENYA WINE AGENCIES	485	WILLING FREIGHT SERVICES LTD	305	MWANDO LOGISTICS
504	AFRICALINK FORWARDERS LIMITED	506	AKL LOGISTICS LTD	142	EMPIRE LOGISTICS SERVICES LTD
535	BENELI FREIGHTERS LIMITED	655	JIHAN FREIGHTERAS LIMITED	196	HIGHLANDS FORWARDERS
557	CHARITIES LOGISTICS LTD	610	FARIHMA TRADING COMPANY LIMITED	556	CHAP CHAP CLEARING & FORWARDING LTD
493	YOLLA FREIGHTERS LTD	873	VAST NETWORK LOGISTICS LIMITED	135	DORIC ENTERPRISES
591	EAST GLOBAL LOGISTICS (K) LIMITED	217	INTERNATIONAL FOREIGN TRADE CO. LTD	302	NATIONA MEDIA GROUP
614	FILIKEN TRANSIT FORWARDERS LIMITED	43	BARGAABA BUSINES AGENCY LTD	329	ONGOING CARGO SERV. LTD
666	JUWELLS TRADING COMPANY LIMITED	495	ZEFT FREIGHTERS	841	SUNTRON INVESTMENTS LTD
404	SIMMUHDS CARGO SERVICE LTD	323	OCEANLINES FREIGHT FORWARDERS	121	DAVMAT COMPANY LTD
746	NORTHWEST KENYA	538	BLACK STALLION SHIPPING SERVICES LTD	296	SAFREIGHT LIMITED
596	ELDOCOM AUTO SPAES LIMITED	733	MOMBASA LOGISTICS LIMITED	720	MARKRIECH (AFRICA) LIMITED
778	RADIANT LOGISTICS LIMITED	412	SKYLUX LOGISTICS LTD	887	WETAA INVESTMENTS LTD
449	TOWFIQ LTD	260	LEMCO FREIGHT FORWARD	108	CORPORATE AVIATION LTD
198	HOMELAND FREIGHT LTD	282	MASTERPIECE COURIER S. LTD	216	INTERNATIONA COMMERCIAL CO. LTD
288	MID OCEAN LTD	359	RAPAT FREIGHT KENYA LTD	490	WORLDNET FREIGHT LTD
328	ONE TOUCH LOGISTICS LTD	789	RORENE LIMITED	645	INLAND AFRICA LOGISTICS LIMITED
405	SITE FORWARDERS LTD	571	DAVKIT ENTERPRISES LIMITED	453	TRANSCARE SERVICES LTD
604	EVERSTAN FREIGHT AND LOGISTICS CO LTD	270	MARDAV LOGISTICS	102	CONTINENTAL FREIGHTERS LTD
283	MATISNGBERG C&F	818	SILVER ANCHOR FREIGHTERS LIMITED	30	AMAZON FREIGHT LTD
551	CARGOMAX LOGISTICS LTD	380	RUKANOTI WOOD DEALER LTD	60	BLUEHILL INVESTMENTS LTD
572	DECCAN FREIGHT LOGISTICS	783	RELIABLE FREIGHT SERVICES LIMITED	116	CULZENBERG FORWARDERS LTD
874	VENUS (K) LIMITED	633	GREATSPAN MARITIME SERVICES LIMITED	99	CHERSHIRE FREIGHT LTD
280	MARKS ENTERPRISES LTD	289	MID-AFRICA SERVICES LTD	470	URGENT CARGO HANDLING LTD
153	EXPRESS KENYA LTD	510	ALFOST ENTERPRISE LIMITED	608	FAIR LOGISTICS AGENCY LIMITED
44	BE ENERGY (K) LTD	331	OPTIMAX KENYA LTD	865	UNION CLEARING AND FORWARDING LTD
353	PRIORITY LOGISTICS LTD	635	GREENLEAF TRADING COMPANY LTD	397	SERENITY SERVICES LTD
101	COMPLAST INDUSTRIES LTD	589	DUPLEX FORWARDER LIMITED	875	VEROM CLEARING & FORWARDING COMPANY LIM
846	TANDEM FREIGHT SERVICES LTD	422	STEEL STRUCTURES LTD	653	JAMES FINLAY MOMBASA LIMITED
45	BEDI INVESTMENTS LTD	82	CARGO CARE INT. LTD	232	JOPUKA LOGISTICS
632	GOLDWELL FORWARDERS LIMITED	734	MONSOON MOVERS LTD	138	DUTY LOGISTICS LIMITED
541	BLUESTAR INTERNATIONAL LIMITED	27	ALMEO LOGISTICS LTD	401	SHARDIN EXPRESS LTD
457	TRANSONIC PROJECT DEVELOPMENT (K) LTD	625	GIFCO KENYA LIMITED	309	NAIROBI CARGO LOGISTICS LTD
146	ESTON DIAMOND LOGISTICS	559	CHIBE FREIGHTERS LIMITED	748	OCEAN STAR GENERAL AGENTS
396	SEDO LOGISTICS LTD	582	DODWELL & COMPANY (EA) LTD	501	ADELCUS AGENCIES (K) LIMITED
350	PRECISE LOGISTICS LTD	757	PALM FREIGHTERS LIMITED	882	VISHAMMAH ENTERPRISES LIMITED
442	TEDICE EXPRESS AGENCIES LTD	816	SIGINON FREIGHT LIMITED	97	CHASEFAST LOGISTICS LTD
500	ACCESS AFRICA LOGISTICS LIMITED	439	TABAKI FREIGHT SERVICES INTERNATIONAL LTD	821	SKYMAN FREIGHTERS LIMITED
210	INSTA PRODUCTS EPZ LTD	418	SOPA CARGO MASTERS	477	VITAGE WAREHOUSE AGENCIES LTD
186	GLINTER LOGISTICS LTD	878	VIBRASI ENTERPRISES LIMITED	861	UMOJA RUBBER PRODUCTS LIMITED
127	DESTINY CONVERYORS	773	PURA LOGISTICS LIMITED	884	WAMBUKA FREIGHTERS LIMITED
3	ACE FREIGHT LTD	679	KENTAN CONNECTIONS LTD	665	JUBILEE C&F (E.A) LTD
303	MUNSHIRAM BUSINESS MACHINES LTD	444	THAM EXPRESS LIMITED	511	ALIBHAI RAMJI (MSA) LIMITED

469	UNITED FREIGHT LOGISTICS	531	BECOZI INVESTMENTS	110	COSMOS INT. LOGISTICS LTD
654	JAMREKS ENTERPRISES	67	BOLT SPEED CARGO FORWARDERS LTD	715	MANIZLE AGENCIES LIMITED
221	JAAV GLOBAL CARGO LTD	562	COAST PROFESSIONAL	661	JOPALM CLEARING & FORWARDING LIMITED
222	JAHA KENYA LTD	433	SUPERIOR CARGO CONVEYORS	423	STEKAR LOGISTICS LTD
352	PRIORITY AIR EXPRESS LTD	71	BRAN SAN C & F LTD	824	SMART CHOICE SERVISES LIMITED
742	NATALYA HOLDINGS LTD	707	M.J CLARKE LIMITED	68	BONFIDE C & F CO LTD
250	KEYNAUGHT LOGISTICS LTD	616	FREIGHT FORWARDERS (K) LIMITED	180	GALLION LOGISTICS
664	JOWAK AGENCIES LIMITED	731	MOMBASA COFFEE LIMITED	239	KATE FREIGHT & TRAVEL LTD
881	VISAN FREIGHT AGENCIES	246	KENYA GENERAL INDUSTRIES LTD	400	SHAMCO LOGISTICS INTERNATIONAL LTD
721	MARUNI PRODUCTS COMPANY LIMITED	191	HAMDI INTERNATIONAL LTD	489	WORLD TRADE FREIGHT LOGISTICS LTD
333	PANALPINA AIRFLO LTD	382	RYCE EAST AFRICA LTD	429	SUNTRON INVESTMENTS LTD
889	WIGGLESWORTH EXPORTERS LIMITED	242	KELVIN AND HANNINGTON	869	UPESI FREIGHT LOGISTICS LIMITED
24	ALEXANDRIA FREIGHT FORWARDERS LTD	279	MARICHOR MARKETING SERVICES LTD	293	MILLENNIUM SOLS. LTD
441	TECHNO RELIEF SERVICES LTD	438	SUZAN DUTY FREE	839	SUNRISE INVESTMENT GROUP LTD
65	BLUEWAVE LOGISTICS SERVICES LTD	23	AKAMAI FREIGHT FORWARDERS LTD	73	BROADVISION LOGISTICS LTD
758	PAMOL CONNECTIONS	341	PILLAR FREIGHT FORWARDERS	385	SAI CARGO MASTERS LTD
554	CHABS TRADE CONNECTIONS LTD	308	NAFENET LOGISTICS LTD	320	NYAGAKA FORWARDERS LTD
872	VANTAGE POINT C&F COMPANY LTD	876	VIBGYOR ENTERPRISES LIMITED	719	MARKENS FREIGHT LOGISTICS
32	ANKEY FREIGHT F. LTD	855	TRANSMAIL INTERNATIONAL LTD	263	LINO STATIONERS K. LTD
296	MONIKS AGENCIES LTD	340	PHILSAM AGENCIES LTD	771	PRINCIPAL FORWARDERS LIMITED
567	DALSAN FREIGHTERS LIMITED	806	SEAGATE LOGISTICS LIMITED	853	TRANSAFRICA LOGISTICS LTD
788	ROMAX FORWARDERS LTD	378	ROMARK FREIGHTERS LTD	563	COLLINS & TIFFANY LIMITED
620	GALAXY LOGISTICS LIMITED	176	FRESH GLOBAL LOGISTICS LTD	597	ELMON AGENCIES LTD
256	KUEHE + NAGEL LIMITED	745	NIBAL FREIGHTERS LIMITED	547	CARGILL KENYA LIMITED
845	TAMANYA FREIGHT & LOGISTICS SERVICES LTD	379	ROTO MOULDERS LTD	817	SILICON FREIGHT INTERNATIONAL COMPANY
890	WILJONES LOGISTICS LTD	319	NODOR KENYA EPZ KENYA	544	BRYSON EXPRESS LIMITED
322	OCEANLINE FREIGHTERS LTD	355	QUICK CARGO SERV. LTD	550	CARGODECK EA LIMITED
147	EURO ONE KENYA	508	ALCORDIA LOGISTICS LIMITED	70	BORABU FREIGHT & TRANSPORT SERVICES
57	BLUE OCEAN (EA) CO. LTD	782	REJEIBY CLEARING & FORWARDING LTD	691	LAXAT TRADERS LIMITED
754	PACMA INVESTMENT LTD	402	SILVER HAWK INTERNATIONAL	706	LYNX LOGISTICS LIMITED
36	ARMCO KENYA	189	GOOD FREIGHT INTERNATIONAL CO. LTD	161	FLOWEPORT LOGISTICS (K) LTD
678	KENREVY CARGO LOGISTICS LIMITED	522	ASHTON APPAREL EPZ LIMITED	710	MACKENZIE MARITIME (EA) LTD
690	LAPE HILLS LOGISTICS LIMITED	810	SHAKAB IMPORTS EXPORTS COMPANY LTD	539	BLACKSTONE LOGISTICS LIMITED
755	PAK PACIFIC LIMITED	206	INDEX CARGO LOGISTICS LTD	892	ZULA GLOBAL DEVELOPMENT COMPANY LIMITED
270	LONGROCK LTD	313	NEIGHBOURS LOGISTICS	416	SONGHONG FREIGHT SERVICES LTD
351	PRIM CARGO LTD	842	SYLKA KENYA LIMITED	391	SEA - SKY EXPRESS LTD
468	UNITED ARYAN EPZ LTD	383	SAG FORWARDERS LTD	390	SAMPHY LOGISTICS SERVICES
631	GOLDEN FREIGHT SERVICES LIMITED	38	ASK CARGO LTD	48	BENJOE LOGISTICS
376	RISING FREIGHT LTD	575	DEL-RAY CARGO SERVICES LTD	428	SUNA FREIGHTERS LTD
363	REALTIME FREIGHT PERFORMANCE LTD	732	MOMBASA COMMERCIAL & INDUSTRIAL AGENT. UNITED (EA) WAREHOUSES LTD		
169	FREIGHT CONSULTANTS LTD	157	FELIBEN IINTERNATIONAL LTD	749	OCEANROCK LOGISTICS LIMITED
374	RIGE LIMITED	187	GLOBAL FREIGHT LOGISTICS LTD	445	THE NAIROBI CLEARING HOUSE
29	ALPHA WORLDWIDE FREIGHT LTD	292	MILANO LOGISTICS LTD	211	INSTANT FREIGHT FORWARDERS LTD
829	SONEVA ENTERPRISES	398	SERVEWELL LOGISTICS LTD	823	SLOPES AGENCIES LIMITED
688	KODAVI INVESTMENTS LIMITED	58	BLUE PEARL LOGISTICS LTD	345	PLANSFREIGHT LTD
452	TRADEWISE AGENCIES (K) LTD	148	EVERLAST ENT. LTD	155	FAIRWAYS CONSOLIDATORS

569	DAP LOGISTICS LIMITED	586	DRENAL ENTERPRISES LIMITED	682	KENYA TRADEX COMPANY LI
334	PANTEL CHEMICALS LTD	730	MOLO FREIGHTERS LIMITED	808	SEASHORE SHIPPING SERVICES LIMITED
603	EURO MARINE LOGISTICS	800	SANDEK AGENCIES LTD	762	PANAL FREIGHTERS LIMITED
877	VIBGYOR FREIGHT SERVICES LTD	838	STEJA GENERAL AGENCIES	220	ISUZU EAST AFRICA LIMITED
467	UNION LOGISTICS LTD	427	SUEKA FREIGHT LTD	215	INTERGRATED LOGISTICS CO. LTD
479	WANSAR ENTERPRISES LTD	705	LYCHEEWOOD LIMITED	46	BEE GEE KEY INV. LTD
181	GARDEN FREIGHT LOGISTICS LTD	134	DODHIA PACKAGING LTD	680	KENVILLA LOGISTICS LIMITED
163	FOAM MATTRESS	781	REGAL FREIGHTERS	96	CHANEL ATLANTIC LTD
580	DIAMOND EXPRESS LIMITED	213	INTER LOGISTICS LTD	700	LLOYDS LOGISTICS LIMITED
384	SAHARRY LTD	264	LOGENIX INTERNATIONAL	120	DAVIS & SHIRTLIFF
237	KANSEI CLEARING & FORWARDING CO. LTD	172	FREIGHT REACH SERVICES	840	SUNSHIP LOGISTICS LIMITED
66	BOLLORE TRANSPORT & LOGISTICS LTD	249	KEVIAN KENYA LTD	687	KITAKA ENTERPRISES LTD
465	UNION EXPRESS LTD	612	FERIDA ENTERPRISES	12	AFRIQFREIGHT SERVICES LTD
133	DIRECT WHEELERS EXPRESS LTD	265	LOGISTIC FREIGHT LIMITED	674	KEIHIN MARITIME SERVICES LIMITED
830	SONYA EXPORTS & IMPORTS AGENCIES	403	SILVER SILICON LTD	456	TRANSONIC LOGISTIC LTD
618	FREIGHTWELL EXPRESS LIMITED	170	FREIGHT IN TIME LTD	298	MORGAN AIR CARGO LTD
780	REFCO FORWARDERS LTD	200	HORIZON FREIGHT FORWARDERS LTD	321	OCEANIC CARGO AGENCIES LTD
812	SHARAF LOGISTICS LIMITED	64	BLUEWAVE LOGISTICS LTD	681	KENYA BONDED WAREHOUSE COMPANY LTD
371	REZA LOGISTICS LTD	671	KALEMU FREIGHTERS LIMITED	459	TWIN CARGO C & F
561	CLARENCE ENTERPRISES LTD	520	APEX STEEL LIMITED	601	ESTHAL LOGISTICS LIMITED
497	ABBA MOTORS LIMITED	641	HEME FREIGHTERS	122	DB SCHENKER LIMITED
888	WICKHAM BROS COMPANY LTD	375	RIOMA FREIGHTER LTD	10	AFRICA DIRECT LTD
726	MENHIR LIMITED	426	STRAIGHTLINE CARGO FORWARDERS	609	FAMO FORWARDERS LIMITED
689	LANDBRIDGE FREIGHTERS LIMITED	247	KENYA VEHICLES MANUFACTURERS LTD	512	ALL FREIGHT LOGISTICS LIMITED
367	RELAY CARGO SERVICES LTD	194	HENATULLAH BROTHERS	473	VICTORIA INTERNATIONAL LOGISTICS LTD
295	MOMO CLEARING & FORWARDING CO. LTD	159	FIRSTHAND CARGO HANDLERS LTD	89	CARGOMASTERS E.A. LTD
54	BIRDWELL VENTURES LTD	480	WANSAR ENTERPRISES LTD	769	PORTLINK LOGISTICS LIMITED
231	JIRES LTD	287	METEOR FREIGHT FORWARDERS LTD	696	LINKAGE CONVEYORS LIMITED
190	GOODMAN INTERNATIONAL LTD	560	CHWILE INVESTMENT LIMITED	49	BESTFAST CARGO
219	INTIME FREIGHT CARGO LTD	358	RAMSFORD FREIGHT FORWARDERS LTD	711	MACKENZIE MARITIME FORWARDERS LTD
646	INSPIRE AFRICA LOGISTICS LTD	100	COMFY LOGISTICS LTD	552	CARIBBEAN FREIGHT LIMITED
41	AZUSA LIMITED	337	PEJON FREIGHT MOVERS LTD	629	GLOBAL CARGO MOVERS LIMITED
750	OCEANWORLD LOGISTICS LIMITED	332	OSERIAN DEVELOPMENT CO. LTD	304	MUSTAFA FREIGHT FORWARDERS LTD
119	DANSAF LOGISTICS	587	DSV AIR AND SEA LIMITED	306	NAASH AFRICA LOGS. LTD
434	SUPERQUICK FREIGHTERS LTD	724	MATRIX FREIGHT LOGISTIC	286	MENTAP RESOURCES FREIGHT LTD
179	G.N CARGO KENYA	42	BAKRIZ HOLDINGS LTD	291	MIG FORWARDERS LTD
566	CRISPOL E.A LTD	461	UCHALE LOGISTICS LTD	72	BRIDGE LAND INTERNATIONAL
777	RABI AGENCY LIMITED	856	TRANSMAX KENYA LIMITED	594	ECS LOGISTICS K LIMITED
214	INTERCITIES FREIGHT & SHIPPING LTD	364	RED ANCHOR FREIGHT LTD	349	PORTWAY E.A. LTD
455	TRANSOCEANIC PROJECT DEV. (K) LTD	529	BATA SHOE COMPANY LIMITED	790	ROSMIK TRADING COMPANY LIMITED
784	REPLAN CARGO HANDLING SERVICES	92	CEBIT CARGO LTD	241	KEARSLEY FREIGHT SERVICES LTD
867	UNITED CLEARING COMPANY LIMITED	728	MITCHELL COTTS FREIGHT KENYA LIMITED	145	EREMO STORES LTD
310	NAJMI CLEARING & FORWARDING LTD	494	ZANAA FREIGHT LIMITED	436	SUPERSONIC CLEARING & FORWARDING LTD
813	SHELTER CONVEYORS LTD	284	MAYA DUTY FREE	738	MULTIPLE SOLUTIONS LIMITED
519	AMEY TRADING COM. LTD	327	ONE TOUCH CARGO SERVICES	630	GMK EAST AFRICA LIMITED
540	BLUE LIME LIMITED	507	AL SHOG SYSTEMS LIMITED	173	FREIGHT SOLUTIONS

514	ALPINE TRADING LIMITED	670	KAISER AGENCIES LIMITED	634	GREENBELT LOGISTICS LIMITED
505	AIR MENZIES INTERNATIONAL	475	VINEP FORWARDERS LTD	801	SASI INTERNATIONAL FREIGHT LOGISTICS LIMITED
553	CARMEL MOUNT FREIGHT (K) LIMITED	795	SAFELANDING LOGISTICS LIMITED	432	SUPERFREIGHT LTD
617	FREIGHTCARE LOGISTICS LIMITED	9	AFFAIRS AFRIQUE LTD	74	BUCHERO ENTERPRISES
50	BESTFREIGHT CONVEYORS LTD	141	EMASA KENYA CLEARING & FORWARDING LTD	63	BELYNE FREIGHTERS & LOGISTICS
521	ARNOP LOGISTICS COMPANY LIMITED	421	SPERANZA INTERNATIONAL	226	JASPER FREIGHT LTD
140	ECU WORLDWIDE (K) LTD	486	WILLMAN FREIGHT AGENCIES	164	FOCUS INITITIVES IMPORT
227	JAY AND JAY LOGISTICS LTD	864	UNIMAR LOGISTICS LIMITED	149	EXCELLENT LOGISTICS
69	BOON TRADE AGENCIES LTD	59	BLUE SEAL FREIGHTERS LTD	228	JEDIMA TRADE AGENCIES LTD
125	DELTA CARGO CONNECTIONS	697	LINKFREIGHT (EA) LIMITED	628	GLOBAL BUSINESS COMMANDERS LTD
154	FAIDA CARGO SERVICES LTD	126	DELTA HANDLING SERVICES LTD	760	PAN AFRICAN SYNDICATE LIMITED
165	FOX INTERNATIONAL LOGISTICS LTD	446	TIMSALES LIMITED	546	CAPRICORN FREIGHT FORWARDERS LIMITED
111	CROSS BORDER CARGO LTD	615	FOOD CHAIN (E.A) LTD	848	TELLAM FREIGHT FORWARDERS LTD
25	ALL SCOPE LOGISTICS LTD	607	EYEBLINK FREIGHT MANAGEMENT	725	MBARAKI PORT WAREHOUSES (K) LIMITED
821	SIVORINE (K) LIMITED	699	LIVERCOT IMPEX LIMITED	343	PLAINLANDS INTER FREIGHT LOGISTICS LTD
273	MAGNETIC KENYA LTD	34	ARAMEX KENYA LTD	847	TATU LIMITED
744	NEEMA PARCELS LIMITED	407	SKYFREIGHT LOGISTICS	466	UNION LOGISTICS CO. LTD
258	LANDMARK PORT CONVEYORS LTD	128	DESTINY FREIGHT SERVICES LTD	727	MERCICO LIMITED
185	GIRAFFE FORWARDERS LTD	880	VILLESSY AGENCY	548	CARGO (EA) LIMITED
515	ALUJO ENTERPRISES	668	KAABA INVESTMENTS LIMITED	235	JUATECH AGENCIES
483	WILCKO FREIGHT SERVICES LTD	527	BAKOL FREIGHTERS	47	BENAIRS LOGISTICS LTD
787	ROBIAM CARGO FREIGHTERS LTD	683	KIMM FREIGHTERS (K) LTD	644	INCOTERMS LOGISTICS SOLUTIONS LIMITED
61	BLUEPLUS FREIGHTERS LTD	785	RIANAB LOGISTICS LIMITED	88	CARGOMANIA LTD
430	SUPERCARE FREIGHT SERVICE LTD	693	LIBAAN LIMITED	676	KENKAL SHIPS & GENERAL CONTRACTORS LTD
95	CHANDARIA INDUSTRIES LTD	87	CARGO WORLD CONVEYORS	435	SUPERSONIC CLEARING & FORWARDING LTD
35	ARBITERS ENTERPRISES LTD	767	PICKET LOGISTICS LIMITED	503	AERO MARINE CARGO SERVICES LIMITED
392	SEABRIDGE FORWARDERS LTD	360	RAY CARGO SERVICES LTD	311	NAS AIRPORT SERVICES LTD
820	SIMBA APPARELS (EPZ) LTD	335	PANWORLD LOGISTICS	752	OZONE FREIGHT FORWARDERS LTD
245	KENYA DUTY FREE COMPLEX	104	CONVENTIONAL CARGO CONVEYORS LTD	659	JONERICS CARGO FORWARDERS
129	DHL GLOBAL FORWARDING	454	TRANSNET FREIGHT INTERNATIONAL LTD	225	JASPA LOGISTICS
14	AGILITY LOGISTICS LTD	109	CORPORATE LEGENDS LTD	7	ADROIT LOGISTICS LIMITED
193	HASS PETROLEUM (K) LTD	268	LONGRANGE TRADING	103	CONTINENTAL LOGISTICS NETWORK LTD
472	VERODAH FREIGHTERS & LOGISTICS LTD	40	ATTIS LOGSOL LTD	703	LOGISTICS THREE SIXTY FIVE LIMITED
2	ACCELER GLOBAL LOGS. LTD	802	SAWA INTERNATIONAL LIMITED	252	KEYWAVE LOGISTICS
708	MACA TRADING COMPANY LIMITED	26	ALLIANCE LOGISTICS	516	AL-YUM HAULIERS LIMITED
530	BAYLAND FREIGHT AGENCIES LIMITED	759	PAMU SERVICES	37	ARNET CONSULT E.A. LIMITED
803	SEABASE SOLUTIONS LIMITED	792	RUMEYSA FREIGHT LIMITED	325	ONE LINK LTD
663	JORDAN FREIGHTERS LTD	606	EXPORT CONSOLIDATION SERVICES	487	WOLFENBERG INTERNATIONAL LTD
588	DUNIYA FORWARDERS LTD	611	FASMU FREIGHT FORWARDERS LIMITED	656	JIJI EAST AFRICA LIMITED
713	MAGOT FREIGHT SERVICES LTD	182	GEFSONS CLEARING & FORWARDING	549	CARGO MOVERS LIMITED
171	FREIGHT POWER LOGS. LTD	56	BLITZ LOGISTICS LTD	425	STERNER LOGISTICS
863	UNEECO PAPER PRODUCTS LTD	96	CHANEL ATLANTIC LTD	638	HANGOOL INVESTMENT GROUP LTD
267	LOGWIN AIR & OCEAN K. LTD	700	LLOYDS LOGISTICS LIMITED	208	INDUS LOGISTICS LD
387	SALIMOND FREIGHT SERV.	639	HANSOL LOGISTICS (K) LTD	212	INSTANT SOLUTIONS
868	UNIVERSAL FREIGHTERS LIMITED	695	LIMUTTI HOLDINGS LIMITED	718	MARITIME FREIGHT LTD
462	UKWALA FREIGHT FORWARDERS	413	SKYWAYS LOGISTICS LTD	406	SKY AND SEA CARGO TRACK LTD

No.	Company	No.	Company	No.	Company
81	CARES CLEARING & FORWARDING CO. LTD	118	AIRBAND CARGO FORW. LTD	204	IMPEX LOGISTICS
365	REGENT FREIGHT SYSTEMS LTD	139	EAST AFRICAN CHAINS LTD	482	WATER FRONT ENTERPRISES
584	DOSHI & COMPANY(HARDWARE) LIMITED	160	FLEET FREIGHTERS LTD	112	CROSS BORDER NETWORKS LTD
640	HARLS CARGO LOGISTICS LIMITED	183	GENERAL FREIGHTERS LTD	837	STARWAY INTERNATIONAL FREIGHT & FORWADER
281	MASCOT HOLDINGS LTD	443	TEPRA LOGISTICS LTD	395	SEAWAYS (K) LTD
702	LOGISTICS SOLUTIONS LTD	879	VICTORY FREIGHT SERVICES	577	DENALI LOGISTICS LIMITED
199	HORIZON EXPRESS CO. LTD	51	BEYOND AFRICA FREIGHTERS LTD	13	AFRIQUE SHIPPING SERVICES
203	IMPEX FREIGHT LTD	394	SEATEC GLOBAL LOGISTICS	770	PORTWOXS CARGO FORWARDERS LTD
883	WAKULIMA AGRIBUSINESS	137	DUKE EXPRESS E.A LTD	80	CARE LOGISTICS KENYA
648	INTERKEN ENTERPRISES	513	ALLPORTS KENYA LIMITED	450	TRADELINE LOGISTICS LTD
117	DAMASA FREIGHT FORWARDERS LTD	243	KENAFRIC INDUSTRIES LTD	536	BEYOND CHANCE FREIGHTERS
621	GATEWAY MARINE SERVICES LTD	143	ENERLOG LIMITED	827	SOLLATEK ELECTRONICS (K) LTD
797	SAHA FREIGHTERS COMPANY LIMITED	478	WAKI CLEARING & FORW. A. LTD	498	ABBAS TRADERS LTD
31	ANISA AGENCIES (K) LTD	844	TALLIENT LOGISTICS LIMITED	852	TRANLINK LOGISTICS LIMITED
764	PESOSI FREIGHTERS LIMITED	33	APPLE LOGISTICS LTD	698	LINKON INVESTEMETS LIMITED
346	POLYGON LOGISITCS LTD	195	HI- TECH IMPEX LTD	240	KAWAISON INTERNATIONAL LTD
354	QUEENS CARGO INTERNATION LTD	819	SILVERHAWK CARGO LTD	458	TRASPORTS LIFTING SEVICES LTD
63	BLUETIDE FREIGHT LOGISTICS	860	UFANISI FREIGHTERS	131	DIGITAL CARGO FORWARDERS LTD
729	MNET STARS LIMITED	545	BULK TRADING (K) LTD	850	TRADE HAUS & GLOBAL LOGISTICS
694	LILY LOGISTICS LIMITED	799	SAHUSA FREIGHTERS LTD	113	CROSS OCEAN LIMITED
83	CARGO CONVEYORS LTD	579	DHANUSH FORWARDERS (K) LTD	411	SKYLINE GLOBAL SERVICES LTD
714	MAK CARGO HANDLING SERVICES LTD	474	VICTORY FREIGHTERS	244	KENTON FREIGHTERS
786	RIPE FREIGHT SERVICES LIMITED	798	SAHEL FREIGHTERS LIMITED	558	CHARLETON AGENCIES LIMITED
565	CORRUGATED SHEETS LIMITED	448	TOTAL TAOUCH EXPRESS	622	GEMINI GLOBAL EXPRESS
524	BAABZ FREIGHT FORWRDERS LTD	22	AIRWAGON CARGO MOVERS LTD	52	BIGWAYS LTD
753	P.N.MASHRU LTD	686	KIPKEBE LIMITED	807	SEALINE FORWARDERS LIMITED
123	DEEPMARK CARGO LTD	791	RUMAN LIMITED	627	GLADIN LOGISTICS (K) LIMITED
414	SMOOTHLINE FREIGHTERS LTD	136	DORTAL SERVICES LTD	269	LONGROAD LOGISTICS LTD
356	RAHMA LOGISTICS LTD	236	KANKAM EXPORTERS LTD	314	NELINE SHIPPING &LOGISTICS ENT. LTD
440	TANDEM SOLUTIONS LTD	525	BAHARI (T) COMPANY LIMITED	21	AIRMARINE AND LAND TRADING LTD
649	INTERSCOPE AIRMARITIME LOGISTICS LTD	451	TRADEWINDS LOGISTICS	647	INTERFACE AGENCIES LIMITED
858	TURNER FREIGHTERS LTD	492	YEAR 2000 FREIGHTERS	775	QUICKLINE INTERNATIONAL LIMITED
285	MENENGAI OIL REFINERY LTD	499	ABSOLUTE FREIGHT & LOGISTIC LTD	386	SALAAH FREIGHT SERVICES
534	BEMMS LIMITED	870	UTILITY FREIGHT LOGISTICS LIMITED	828	SOLSON CLEARING COMPANY
262	LINK AFRIQUE KENYA	599	ERIKAH MARITIME SERVICES LIMITED	502	ADMIRAL CARGO CONCEPT LIMITED
202	IMPERIAL CARGO INTERNATIONAL	722	MARYDAVID INVESTMENTS LTD	78	CANDID FREIGHTERS LTD
662	JORA LOGISTICS LTD	302	MULTIPACKAGING LTD - PRINTPA	484	WILLIMA ENTERPRISES LTD
564	CONKEN CARGO FORWARDERS LIMITED	772	PROVINCIAL CLEARING & FORWARDING	130	DHL WORLDWIDE EXPRESS (K) LTD
420	SPEEDEX LOGISTICS LTD	15	AGS WORLDWIDE MOVERS LTD	496	A.M.A AL AMMARY LTD
685	KIMU FREIGHT AGENCIES LTD	368	REMARC LOGISTICS	592	EBMAR INVESTMENTS COMPANY LTD
162	FLOWERWINGS EXPRESS (K) LTD	86	CARGO PLAN MOVERS & FORWARDERS	518	AMBERTO AGENCIES LIMITED
114	CROWN INDUSTIRES LTD	793	S & L PORT SOLUTIONS LTD	419	SOUTHLINK SERVICES LTD
523	ATACO FREIGHT SERVICES LIMITED	85	CARGO NEWS EXPRESS LTD	156	FANTASH FREIGHTERS & LOGISTICS
623	GENERAL CARGO SERVICES LIMITED	605	EXCELLENT SERVICES FREIGHTERS LIMITED	297	MONTERA CARGO LTD
836	SPRING LOGISTICS LIMITED	849	TIDAL LOGISTICS LIMITED	481	WARTON AGENCIES
851	TRADELINK LOGISTICS LIMITED	774	QUICK MOVERS (K) LTD	488	WORLD CLASS FREIGHT LOGISTICS LTD

338	PENTAGON LOGISTICS LTD	107	CORONET CARGO LTD	460	TYKE LOGISTICS
815	SIDOMAN INVESTMENT LIMITED	590	EAST AFRICA CARGO LOGISTICS LTD	201	ICEBERG MOVERS ENTERPRISES LTD
372	RICHENS LOGISTICS LTD	643	HYGIENE AFRICA LIMITED	357	RAI PLYWOODS K LTD
192	HAPPYWORLD FREIGHTERS	410	SKYLINE EXPRESS SERVICES LTD	826	SOKOTA INVESTMENTS LTD
348	PORTAL CORPORATION	223	JAMBO LOGISTICS E.A.	716	MARAKIB FREIGHTERS LTD
756	PALLET LOGISTICS LIMITED	526	BAHARI FORWARDERS LTD	471	UTEX FREIGHT SERVICES LTD
144	EQUIRAK LOGISTICS LTD	118	DANROS (K) LTD	776	QUISSAN ENTERPRISES LTD
106	CORNERSTONE LTD	737	MULTCARGO FREIGHTERS LIMITED	91	CATESAM ENTERPRISES LTD
574	DELMONTE KENYA LIMITED	347	PORT CONVEYORS LTD	740	MUZDALIFA CLEARING & FORWARDING CO. LTD
657	JMK ENTERPRISES LIMITED	53	BIMA CLEARING & FORWARDING LTD	124	DELFAST LOGISTICS
684	KIMNET AGENCIES LTD	583	DON SIMON LIMITED	585	DOTCOM CONSULTANTS LIMITED
602	EUGFAVOUR LOGISTICS SOLUTION LIMITED	339	PHIL LOGISTICS CO	290	MIDWAVE FREIGHTERS LTD
532	BEEKAY LOGISTICS LIMITED	255	KINGS CARGO AGENCIES LTD	93	CENTRAL CARGO SERVICES LTD
517	AMARANTHA AGENCY LTD	330	ONWARD CARGO SYSTEMS C. LTD	675	KENFREIGHT EA LIMITED
229	JEMI FREIGHT LTD	476	VISION ENTERPRISES LTD	761	PANAFRICA LOGISTICS LIMITED
650	ISSA CLEARING & FORWARDING LIMITED	578	DERRICKSON SYSTEMS LIMITED	766	PETRUT FREIGHT FORWARDRS LTD
1	ABER PAUL LIMITED	75	BURHANI EXPRESS LOGISTICS LTD	373	RIFT CARGO HANDLING LTD
233	JOWAKA SUPER LINKS LTD	177	FREVA LOGISTICS SERVICES	150	EXPIDITE LOGISTICS LTD
891	WORLD CLASS ENT. CO.LTD	167	FRANK & GEOFFREY CARGO LTD	300	MUCHEBA SERVICES
857	TRIBERTOO (K) LIMITED	613	FIBER FREIGHT FORWARDERS	94	CHAIRMANS HOLDINGS
765	PETROSA GENERAL CONTRACTORS LTD	677	KENMONT LOGISTICS LIMITED	342	PINNACO LOGISTICS LTD
158	FILMLINE LTD	317	NEW WIDE GARMENTS KENYA EPZ	105	CONVENTIONAL CARGO CONVEYORS LTD
568	DANJAM INVESTMENTS COMPANY LIMITED	763	POLO AUTOFREIGHT FORWARDERS LIMITED	238	KARSIS GLOBAL LOGISTICS LTD
862	UNDERSEAS MERCHANTS	316	NEOSERVE LOGISTICS LTD	315	NEO SEALAND REGIONAL FREIGHTERS LTD
701	LOGISTICS SERVICES LIMITED	224	JAMUSA ENTERPRISES LTD	528	BAMBURI SHIPCHANDLERS (KENYA) LIMITED
809	SEATEL INVESTMENTS LTD	318	NOASHS ARK ENTERPRISES	266	LOGISTIC LINK
833	SPEAR LOGISTICS (K) LTD	294	MOHABAB ENTERPRISES	251	KEYNOTE LOGISTICS LTD
581	DIVERSE CARGO MARINE & AIR C&F SERVICES	805	SEACREST LOGISTICS SOLUTION (K) LIMITED	431	SUPERFIRST FORWARDERS LTD
576	DELTA EXPRESS LIMITED	652	JAMBO TRADERS LIMITED	259	LEADTIME CARGO LOGISTICS
115	CRUCIAL CARGO MOVERS	736	MTAPANGA AGENCIES LIMITED	417	SONIC FRESH COMPANY
642	HEROS COMPANY LIMITED	739	MUSTAFA MOHAMED ISSA LTD	593	ECHKEN AGENCIES
704	LOW SEA INTERNATIONAL AGENCIES LTD	366	REGIONAL ENTERPRENEURS (K) LTD	843	SYLLER IMPRESS COMPANY LIMITED
166	FRAMIC CARGO AGENCIES LTD	491	WOW BEVERAGES LTD	77	CALLFAST SERVICES LTD
570	DAVELINE NETWORK COMPANY LIMITED	464	UNICK COMPANY LTD	336	PEDWIN LTD
409	SKYLIFT CARGO LTD	184	GIBRON LIMITED	370	RENAISSANCE LIMITED
175	FREIGHTSORE AGENCIES LTD	39	ATLANTIC LOGISTICS INTERNATIONAL LTD	132	DIKENS LOGISTICS LTD
377	ROLLING CARGO LTD	168	FREIGHT COMMANDOS LTD	362	REALTIME CARGO LTD
747	OCEAN PACIFIC INTERNATIONAL LTD	831	SOUTHERN SHIPPING SERVICES LIMITED	55	BLINK LOGISTICS LTD
600	ERI-KENYA LIMITED	261	LIFT CARGO	152	EXPORT TRADING LTD
272	MAGNATE LOGISTICS LTD	825	SMART TRADERS LTD	871	UTMOST FREIGHT MASTERS LIMITED
17	AIR SEA LOGISTICS LIMITED	16	AIR CONNECTION LTD	76	BUYERS LOGISTICS LTD
98	CHEM LABS LTD	207	INDEX CARGO LOGISTICS LTD	463	UNAMAK COMPANY LTD
324	OKAMOTO FREIGHT SERVICES LTD	672	KAMANGA FREIGHT SERVICES LTD	709	MACFREIGHT FORWARDERS CO. LTD
804	SEACON KENYA LIMITED	326	ONE ON ONE LOGISTICS LTD	625	GEORINE AGENCIES LTD
399	SHABA AFRICA LOGISTICS	832	SPART FREIGHT LOGISTICS LIMITED	509	AL-EMIR LIMITED
447	TOPLINE LOGISTICS LTD	415	SONDDEKA FREIGHT FORWARDERS LTD	4	ACTS BUSINESS SYSTEMS

573	DEKAM FREIGHTERS LIMITED	667	K.B FREIGHTERS LIMITED	280	MARKS ENTERPRISES LTD
555	CHAI TRADING COMPANY LIMITED	735	MORNING GLORY FREIGHT SERVICES LTD	153	EXPRESS KENYA LTD
188	GLOBAL REACH LOGISTICS LTD	658	JOKIVIEW GENERAL (K) LIMITED	44	BE ENERGY (K) LTD
234	JOWAM CARGO CO. LTD	218	INTERSPEED LOGISTICS LTD	353	PRIORITY LOGISTICS LTD
6	ADONAI TRADING & LOGISTICS LTD	408	SKYLARK CONVEYORS (K) LTD	101	COMPLAST INDUSTRIES LTD
637	HAMBUFREIGHT SERVICES LTD	19	AIRCOM CARGO LOGISTICS	846	TANDEM FREIGHT SERVICES LTD
151	EXPOLANKA FREIGHT LTD	424	STELLAR LOGITSICS LTD	45	BEDI INVESTMENTS LTD
275	MANUFACTURERS & SUPPLIERS LTD	854	TRANSFREIGHT LOGISTICS LIMITED	632	GOLDWELL FORWARDERS LIMITED
669	KADMUSS FREIGHT LOGISTICS LIMITED	274	MAKIWANI LOGISTICS LTD	541	BLUESTAR INTERNATIONAL LIMITED
543	BRITEX ENTERPRISES CO. LTD	598	EMOTEL KENYA LIMITED	457	TRANSONIC PROJECT DEVELOPMENT (K) LTD
624	GEOMWA EXPRESS CARGO LTD	388	SALMAR CLEARING & FORWARDING LTD	146	ESTON DIAMOND LOGISTICS
84	CARGO NEST (K) LTD	886	WESTON LOGISTICS LIMITED	396	SEDO LOGISTICS LTD
197	HIMA FREIGHT FORWARDERS LTD	209	INSPIRE CARGO LOGISTICS LTD	350	PRECISE LOGISTICS LTD
723	MARYMAC FREIGHT CO LTD	90	CARRAMURE INTERNATIONAL	442	TEDICE EXPRESS AGENCIES LTD
741	MWANGO CLEARING INVESTMENTS LIMITED	28	ALPHA IMPEX LOGISTICS INT LTD	500	ACCESS AFRICA LOGISTICS LIMITED
271	MACSIM CARGO SERVICES LTD	254	KIND LOGISTICS LTD	210	INSTA PRODUCTS EPZ LTD
278	MARGIE AGENCIES	174	FREIGHT WINGS LTD	186	GLINTER LOGISTICS LTD
651	JAGOMA LOGISTICS	276	MARACA ENTERPRISES	127	DESTINY CONVERYORS
299	MOVE AND PICK	619	FY SIMBA SHIPPING AGENTS LIMITED	3	ACE FREIGHT LTD
636	GULF CROSS LTD	660	JONPHIX FREIGHT SERVICES LIMITED	303	MUNSHIRAM BUSINESS MACHINES LTD
763	PEERLESS TEA SERVICES LIMITED	595	EDISA HOLDINGS (K) LIMITED	230	JIPE HOLDINGS LTD
814	SHIPFREIGHT LOGISTICS LIMITED	794	S.K AMIN LIMITED	673	KANNON C&F LTD
712	MAGNEX LIMITED	369	REMOVAL GOODS SERVICES (K) LTD	835	SPEDAG INTERFREIGHT KENYA LIMITED
393	SEALINE LOGISTICS LTD	859	TURNING POINT FREIGHT LTD	779	RANK NETWORK & LOGISTICS LTD
437	SUPERSONIC FREIGHTERS (K) LTD	248	KENYA WINE AGENCIES	485	WILLING FREIGHT SERVICES LTD
8	AEROPATH KENYA LTD	504	AFRICALINK FORWARDERS LIMITED	506	AKL LOGISTICS LTD
11	AFRICAIR MANAGEMENT & LOGISTICS	535	BENELI FREIGHTERS LIMITED	655	JIHAN FREIGHTERAS LIMITED
253	KIAMBA C & F LTD	557	CHARITIES LOGISTICS LTD	610	FARIHMA TRADING COMPANY LIMITED
79	CAR AND GENERAL LTD	493	YOLLA FREIGHTERS LTD	873	VAST NETWORK LOGISTICS LIMITED
5	ADAIR FREIGHT SERVICES	591	EAST GLOBAL LOGISTICS (K) LIMITED	217	INTERNATIONAL FOREIGN TRADE CO. LTD
301	MULLER LOGISTICS LTD	614	FILIKEN TRANSIT FORWARDERS LIMITED	43	BARGAABA BUSINES AGENCY LTD
20	AIRFREIGHT & LOGISTICS WORLD WIDE LTD	656	JUWELLS TRADING COMPANY LIMITED	495	ZEFT FREIGHTERS
307	NAFAST LTD	404	SIMMUHDS CARGO SERVICE LTD	323	OCEANLINES FREIGHT FORWARDERS
381	RUSINGA INTERNATIONAL	746	NORTHWEST KENYA	538	BLACK STALLION SHIPPING SERVICES LTD
692	LEENA APPARELS LTD	596	ELDOCOM AUTO SPAES LIMITED	733	MOMBASA LOGISTICS LIMITED
361	REAL DREAM INT. LTD	778	RADIANT LOGISTICS LIMITED	412	SKYLUX LOGISTICS LTD
178	FRONTIER LINKS CO.LTD	449	TOWFIQ LTD	260	LEMCO FREIGHT FORWARD
537	BILDAD ENTERPRISES LIMITED	198	HOMELAND FREIGHT LTD	282	MASTERPIECE COURIER S. LTD
811	SHAQSHAN FREIGHT LIMITED	288	MID OCEAN LTD	359	RAPAT FREIGHT KENYA LTD
389	SAM AND SAN LOGISTICS	328	ONE TOUCH LOGISTICS LTD	789	RORENE LIMITED
885	WAY TO ASSOCIATES LIMITED	405	SITE FORWARDERS LTD	571	DAVKIT ENTERPRISES LIMITED
205	IN TIME FORWARDERS LTD	604	EVERSTAN FREIGHT AND LOGISTICS CO LTD	270	MARDAV LOGISTICS
751	OGAKA FREIGHT LOGISTICS LTD	283	MATISNGBERG C&F	818	SILVER ANCHOR FREIGHTERS LIMITED
834	SPECIAL COLLECTION SERVICES	551	CARGOMAX LOGISTICS LTD	380	RUKANOTI WOOD DEALER LTD
717	MAR-FRONTIER KENYA LTD	572	DECCAN FREIGHT LOGISTICS	783	RELIABLE FREIGHT SERVICES LIMITED
257	LABORATORY & ALLIED LTD	874	VENUS (K) LIMITED	633	GREATSPAN MARITIME SERVICES LIMITED

289	MID-AFRICA SERVICES LTD	470	URGENT CARGO HANDLING LTD	322	OCEANLINE FREIGHTERS LTD
510	ALFOST ENTERPRISE LIMITED	608	FAIR LOGISTICS AGENCY LIMITED	147	EURO ONE KENYA
331	OPTIMAX KENYA LTD	865	UNION CLEARING AND FORWARDING LTD	7	BLUE OCEAN (EA) CO. LTD
635	GREENLEAF TRADING COMPANY LTD	397	SERENITY SERVICES LTD	754	PACMA INVESTMENT LTD
589	DUPLEX FORWARDER LIMITED	875	VEROM CLEARING & FORWARDING COMPANY LIMITED		ARMICO KENYA
422	STEEL STRUCTURES LTD	653	JAMES FINLAY MOMBASA LIMITED	678	KENREVY CARGO LOGISTICS LIMITED
82	CARGO CARE INT. LTD	232	JOPUKA LOGISTICS	690	LAPE HILLS LOGISTICS LIMITED
734	MONSOON MOVERS LTD	138	DUTY LOGISTICS LIMITED	755	PAK PACIFIC LIMITED
27	ALMEO LOGISTICS LTD	401	SHARDIN EXPRESS LTD	270	LONGROCK LTD
626	GIFCO KENYA LIMITED	309	NAIROBI CARGO LOGISTICS LTD	351	PRIM CARGO LTD
559	CHIBE FREIGHTERS LIMITED	748	OCEAN STAR GENERAL AGENTS	468	UNITED ARYAN EPZ LTD
582	DODWELL & COMPANY (EA) LTD	501	ADELCUS AGENCIES (K) LIMITED	631	GOLDEN FREIGHT SERVICES LIMITED
757	PALM FREIGHTERS LIMITED	882	VISHAMMAH ENTERPRISES LIMITED	376	RISING FREIGHT LTD
816	SIGINON FREIGHT LIMITED	97	CHASEFAST LOGISTICS LTD	363	REALTIME FREIGHT PERFORMANCE LTD
439	TABAKI FREIGHT SERVICES INTERNATIONAL LTD	821	SKYMAN FREIGHTERS LIMITED	169	FREIGHT CONSULTANTS LTD
418	SOPA CARGO MASTERS	477	VITAGE WAREHOUSE AGENCIES LTD	374	RIGE LIMITED
878	VIBRASI ENTERPRISES LIMITED	861	UMOJA RUBBER PRODUCTS LIMITED	29	ALPHA WORLDWIDE FREIGHT LTD
773	PURA LOGISTICS LIMITED	884	WAMBUKA FREIGHTERS LIMITED	829	SONEVA ENTERPRISES
679	KENTAN CONNECTIONS LTD	665	JUBILEE C&F (E.A) LTD	688	KODAVI INVESTMENTS LIMITED
444	THAM EXPRESS LIMITED	511	ALIBHAI RAMJI (MSA) LIMITED	452	TRADEWISE AGENCIES (K) LTD
542	BRANDED FINE FOODS LTD	469	UNITED FREIGHT LOGISTICS	531	BECOZI INVESTMENTS
743	NEBULA CONVEYORS LIMITED	654	JAMREKS ENTERPRISES	67	BOLT SPEED CARGO FORWARDERS LTD
62	BLUERANGE LOGISTICS LTD	221	JAAV GLOBAL CARGO LTD	562	COAST PROFESSIONAL
344	PLAINS LOGISTICS LTD	222	JAHA KENYA LTD	433	SUPERIOR CARGO CONVEYORS
305	MWANDO LOGISTICS	352	PRIORITY AIR EXPRESS LTD	71	BRAN SAN C & F LTD
142	EMPIRE LOGISTICS SERVICES LTD	742	NATALYA HOLDINGS LTD	707	M.J CLARKE LIMITED
196	HIGHLANDS FORWARDERS	250	KEYNAUGHT LOGISTICS LTD	616	FREIGHT FORWARDERS (K) LIMITED
556	CHAP CHAP CLEARING & FORWARDING LTD	664	JOWAK AGENCIES LIMITED	731	MOMBASA COFFEE LIMITED
135	DORIC ENTERPRISES	881	VISAN FREIGHT AGENCIES	246	KENYA GENERAL INDUSTRIES LTD
312	NATIONA MEDIA GROUP	721	MARUNI PRODUCTS COMPANY LIMITED	191	HAMDI INTERNATIONAL LTD
329	ONGOING CARGO SERV. LTD	333	PANALPINA AIRFLO LTD	382	RYCE EAST AFRICA LTD
841	SUNTRON INVESTMENTS LTD	889	WIGGLESWORTH EXPORTERS LIMITED	242	KELVIN AND HANNINGTON
121	DAVMAT COMPANY LTD	24	ALEXANDRIA FREIGHT FORWARDERS LTD	279	MARICHOR MARKETING SERVICES LTD
796	SAFREIGHT LIMITED	441	TECHNO RELIEF SERVICES LTD	438	SUZAN DUTY FREE
720	MARKRIECH (AFRICA) LIMITED	65	BLUEWAVE LOGISTICS SERVICES LTD	23	AKAMAI FREIGHT FORWARDERS LTD
887	WETAA INVESTMENTS LTD	758	PAMOL CONNECTIONS	341	PILLAR FREIGHT FORWARDERS
108	CORPORATE AVIATION LTD	554	CHABS TRADE CONNECTIONS LTD	308	NAFENET LOGISTICS LTD
216	INTERNATIONA COMMERCIAL CO. LTD	872	VANTAGE POINT C&F COMPANY LTD	876	VIBGYOR ENTERPRISES LIMITED
490	WORLDNET FREIGHT LTD	32	ANKEY FREIGHT F. LTD	855	TRANSMAIL INTERNATIONAL LTD
645	INLAND AFRICA LOGISTICS LIMITED	296	MONIKS AGENCIES LTD	340	PHILSAM AGENCIES LTD
453	TRANSCARE SERVICES LTD	567	DALSAN FREIGHTERS LIMITED	806	SEAGATE LOGISTICS LIMITED
102	CONTINENTAL FREIGHTERS LTD	788	ROMAX FORWARDERS LTD	378	ROMARK FREIGHTERS LTD
30	AMAZON FREIGHT LTD	620	GALAXY LOGISTICS LIMITED	176	FRESH GLOBAL LOGISTICS LTD
60	BLUEHILL INVESTMENTS LTD	256	KUEHE + NAGEL LIMITED	745	NIBAL FREIGHTERS LIMITED
116	CULZENBERG FORWARDERS LTD	845	TAMANYA FREIGHT & LOGISTICS SERVICES LTD	379	ROTO MOULDERS LTD
99	CHERSHIRE FREIGHT LTD	890	WILJONES LOGISTICS LTD	319	NODOR KENYA EPZ KENYA

355	QUICK CARGO SERV. LTD	550	CARGODECK EA LIMITED	730	MOLO FREIGHTERS LIMITED
508	ALCORDIA LOGISTICS LIMITED	70	BORABU FREIGHT & TRANSPORT SERVICES	805	SANDEK AGENCIES LTD
782	REJEIBY CLEARING & FORWARDING LTD	691	LAXAT TRADERS LIMITED	838	STEJA GENERAL AGENCIES
402	SILVER HAWK INTERNATIONAL	706	LYNX LOGISTICS LIMITED	427	SUEKA FREIGHT LTD
189	GOOD FREIGHT INTERNATIONAL CO. LTD	161	FLOWEPORT LOGISTICS (K) LTD	705	LYCHEEWOOD LIMITED
522	ASHTON APPAREL EPZ LIMITED	710	MACKENZIE MARITIME (EA) LTD	134	DODHIA PACKAGING LTD
810	SHAKAB IMPORTS EXPORTS COMPANY	539	BLACKSTONE LOGISTICS LIMITED	781	REGAL FREIGHTERS
206	INDEX CARGO LOGISTICS LTD	892	ZULA GLOBAL DEVELOPMENT COMPANY LIMITED	213	...NDER LOGISTICS LTD
313	NEIGHBOURS LOGISTICS	416	SONGHONG FREIGHT SERVICES LTD	264	LOGENIX INTERNATIONAL
842	SYLKA KENYA LIMITED	391	SEA - SKY EXPRESS LTD	172	FREIGHT REACH SERVICES
383	SAG FORWARDERS LTD	390	SAMPHY LOGISTICS SERVICES	249	KEVIAN KENYA LTD
38	ASK CARGO LTD	48	BENJOE LOGISTICS	612	FERIDA ENTERPRISES
575	DEL-RAY CARGO SERVICES LTD	428	SUNA FREIGHTERS LTD	265	LOGISTIC FREIGHT LIMITED
732	MOMBASA COMMERCIAL & INDUSTRIAL AGENT. LTD		UNITED (EA) WAREHOUSES LTD	403	SILVER SILICON LTD
157	FELIBEN IINTERNATIONAL LTD	749	OCEANROCK LOGISTICS LIMITED	170	FREIGHT IN TIME LTD
187	GLOBAL FREIGHT LOGISTICS LTD	445	THE NAIROBI CLEARING HOUSE	200	HORIZON FREIGHT FORWARDERS LTD
292	MILANO LOGISTICS LTD	211	INSTANT FREIGHT FORWARDERS LTD	64	BLUEWAVE LOGISTICS LTD
398	SERVEWELL LOGISTICS LTD	823	SLOPES AGENCIES LIMITED	671	KALEMU FREIGHTERS LIMITED
58	BLUE PEARL LOGISTICS LTD	345	PLANSFREIGHT LTD	520	APEX STEEL LIMITED
148	EVERLAST ENT. LTD	155	FAIRWAYS CONSOLIDATORS	641	HEME FREIGHTERS
110	COSMOS INT. LOGISTICS LTD	569	DAP LOGISTICS LIMITED	375	RIOMA FREIGHTER LTD
715	MANIZLE AGENCIES LIMITED	334	PANTEL CHEMICALS LTD	426	STRAIGHTLINE CARGO FORWARDERS
661	JOPALM CLEARING & FORWARDING LIMITED	603	EURO MARINE LOGISTICS	247	KENYA VEHICLES MANUFACTURERS LTD
423	STEKAR LOGISTICS LTD	877	VIBGYOR FREIGHT SERVICES LTD	194	HENATULLAH BROTHERS
824	SMART CHOICE SERVISES LIMITED	467	UNION LOGISTICS LTD	682	KENYA TRADEX COMPANY LIMITED
68	BONFIDE C & F CO LTD	479	WANSAR ENTERPRISES LTD	808	SEASHORE SHIPPING SERVICES LIMITED
180	GALLION LOGISTICS	181	GARDEN FREIGHT LOGISTICS LTD	762	PANAL FREIGHTERS LIMITED
239	KATE FREIGHT & TRAVEL LTD	163	FOAM MATTRESS	220	ISUZU EAST AFRICA LIMITED
400	SHAMCO LOGISTICS INTERNATIONAL LTD	530	DIAMOND EXPRESS LIMITED	215	INTERGRATED LOGISTICS CO. LTD
489	WORLD TRADE FREIGHT LOGISTICS LTD	384	SAHARRY LTD	46	BEE GEE KEY INV. LTD
429	SUNTRON INVESTMENTS LTD	237	KANSEI CLEARING & FORWARDING CO. LTD	680	KENVILLA LOGISTICS LIMITED
869	UPESI FREIGHT LOGISTICS LIMITED	66	BOLLORE TRANSPORT & LOGISTICS LTD	120	DAVIS & SHIRTLIFF
293	MILLENNIUM SOLS. LTD	465	UNION EXPRESS LTD	840	SUNSHIP LOGISTICS LIMITED
839	SUNRISE INVESTMENT GROUP LTD	133	DIRECT WHEELERS EXPRESS LTD	687	KITAKA ENTERPRISES LTD
73	BROADVISION LOGISTICS LTD	830	SONYA EXPORTS & IMPORTS AGENCIES LTD		AFRIQFREIGHT SERVICES LTD
385	SAI CARGO MASTERS LTD	618	FREIGHTWELL EXPRESS LIMITED	674	KEIHIN MARITIME SERVICES LIMITED
320	NYAGAKA FORWARDERS LTD	780	REFCO FORWARDERS LTD	456	TRANSONIC LOGISTIC LTD
719	MARKENS FREIGHT LOGISTICS	812	SHARAF LOGISTICS LIMITED	298	MORGAN AIR CARGO LTD
263	LINO STATIONERS K. LTD	371	REZA LOGISTICS LTD	321	OCEANIC CARGO AGENCIES LTD
771	PRINCIPAL FORWARDERS LIMITED	561	CLARENCE ENTERPRISES LTD	681	KENYA BONDED WAREHOUSE COMPANY LTD
853	TRANSAFRICA LOGISTICS LTD	497	ABBA MOTORS LIMITED	459	TWIN CARGO C & F
563	COLLINS & TIFFANY LIMITED	888	WICKHAM BROS COMPANY LTD	601	ESTHAL LOGISTICS LIMITED
597	ELMON AGENCIES LTD	726	MENHIR LIMITED	122	DB SCHENKER LIMITED
547	CARGILL KENYA LIMITED	689	LANDBRIDGE FREIGHTERS LIMITED	10	AFRICA DIRECT LTD
817	SILICON FREIGHT INTERNATIONAL COMPANY	694	RELAY CARGO SERVICES LTD	609	FAMO FORWARDERS LIMITED
544	BRYSON EXPRESS LIMITED	586	DRENAL ENTERPRISES LIMITED	512	ALL FREIGHT LOGISTICS LIMITED

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