

**THE ROLE OF COMMERCIAL MOTORCYCLES IN THE RURAL ECONOMY:  
A CASE STUDY OF LAIKIPIA EAST SUB-COUNTY, KENYA.**

**BY**

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**A project paper submitted in partial fulfillment of the requirements for the Degree of  
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Studies, University of Nairobi.**

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## DECLARATION

This is my original work and has never been presented to University of Nairobi or any university for the award of degree or other Academic Award.

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## DEDICATION

I dedicate this piece of work to my wife Ann and the entire family for their patience and tolerance during this period of study. *“He who endures in troubled times is strong to reach the final bliss when trouble ends”*.

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## **ACRONYMS AND ABBREVIATIONS**

KNBS	Kenya National Bureau of Statistics
GPS	Global Positioning System
NMIMT	Non-Motorised/Intermediate Modes of Transport
NTSA	National Transport and Safety Authority
RoK	Republic of Kenya
SPSS	Statistical Package for the Social Sciences
UNESCO	United Nations Educational Scientific and Cultural Organization
UNEP	United National Environment Programme
WHO	World Health Organization

## ABSTRACT

The aim of this study was to determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County. Primary data was obtained from questionnaire survey and in-depth interviews. The sample size was established to be 61 out of the target population of 153. The objectives of the study were: (i) To determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County; (ii) To examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County; and (iii) To investigate the spatial distribution patterns of commercial motorcycles in Laikipia East Sub-County. Data was analysed using Chi-square test, Spearman's Rank Correlation, Percentages, pie-charts and bar-charts techniques. The first hypothesis of the study was tested by Chi-square ( $\chi^2$ ) test and second hypothesis was tested using Spearman's Rank Correlation coefficient.

The first hypothesis was: (i) there is no significant difference between promotion of agriculture and commercial motorcycles' trips in Laikipia East Sub-County. Major findings were: There was a statistical significance in the difference between promotion of agriculture and commercial motorcycles' trips in Laikipia East Sub-County. Since the calculated value of  $\chi^2$  was greater than the critical  $\chi^2$ , the null hypothesis was rejected and therefore a conclusion was made that promotion of agriculture was dependent on commercial motorcycles' trips in Laikipia East Sub-County.

The second hypothesis was: (ii) there is no significant difference between previous employment and commercial motorcycles contribution to poverty alleviation in Laikipia East Sub-County. Results show that there is a medium positive relationship of 0.318 between previous employment income and the current commercial motorcycle income.  $r^2$  was therefore 0.318<sup>2</sup>. The study found out that commercial motorcycle contributes 10 percent towards poverty alleviation in Laikipia East Sub-County. The study also found out that key activities which had come up as result of commercial motorcycle ridership generate gainful employment and hence alleviating poverty in Laikipia East Sub-county. The study recommended that the county government should rehabilitate the roads and construct motorcycle lanes particularly in Laikipia East Sub-County. It should also train, retrain and emphasize on best practices on motorcycle operations. The government should establish well updated and accurate data base on commercial motorcycle activities for their sustainability.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

Transport is an important element in development and it affords the social, economic and political interaction that most people take for granted (Button and Hensher, 2001). Provision of transport infrastructure has grown extensively across the globe through a range of networks of modes which have undergone technological improvements cutting across the motive power, the tracks and the means that serve as compartment for passengers and goods. Personal mobility is one of democracy's most valued freedoms and it is, therefore, not surprising that a high proportion of man's income is devoted to the movement of the goods and transactions. The importance to the socio-economic, political and cultural development of any nation is underscored by Munby's (1968) statement that "there is no escape from transport".

Much of rural travel in Africa is however on foot or through intermediate means of transport, operating along the local footpath sand tracks (Barwell, 1996). These constitute what Starkey (2005) referred to as "invisible" rural transport, consisting of footpaths, cart and cycle tracks and foot bridges which may not be found on maps. Transport is a "system" comprising two major components, namely, the vehicle commonly referred to as the "carrying unit" and the path which in transport terms is commonly referred to as "the way". The latter component constitutes the transport infrastructure. Thus, the transport system comprises of an infrastructure component and a service component (Tatenda, 2002).

According to the Oxford Hachette Dictionary (2008 edition), "A motorbike is a small motorcycle with a low frame and small wheels and elevated handlebars". A decline in organized public transport systems has led to rapid growth in non-conventional means of public transport, initially provided by minibuses and shared taxi/vans, and more recently by commercial motorcycles. The term "*boda boda*" is derived from the English word "border." and have been in existence since 1990, when young people in Busia, a town that shares a border with Uganda, used bicycles to smuggle goods across the border. *Boda boda* services are known to have originated in the Busia County of Tororo District in Eastern Uganda in the mid-1960s (Malmberg Calvo 1994). Both bicycle and motorcycle services are often known by the same name *boda boda*, although

*machala* (Western Uganda) or *zabala* (Mukono District) are preferred in some areas for the motorcycle services (Leyland 1999). The use of motorbikes as means of public transportation in Nigeria began in Calabar – Cross River State in the 1970s (Adesanaya, 1998).

Over the past decade there has been a significant growth in the use of motorcycles as a commercial public transport mode in countries in sub-Saharan Africa. Commercial motorcycles offer certain transport advantages in the form of easy maneuverability, ability to travel on poor roads, and demand responsiveness. Commercial motorcycle service growth has also led to an increase in road accidents, traffic management problems, pervasive noise and increases in local air pollution and greenhouse gas emissions (Ajar, 2011). While the urban motorbike taxi is a relative newcomer, the bicycle taxi already existed as far back as the 1930s in the Senegalese city of Kaolack (Morice, 1981) and the 1960s in Kenya. Motorbike taxis appeared in Nigeria in the 1970s (Oyesiku, 2001) but their true rise seems to have started in the mid-1980s in Niger, Cameroon, Togo, Benin, Uganda and Kenya as a development from the bicycle taxi (Agossou, 2004; Howe, Maunder, 2004; Mutiso and Behrens, 2011). Zelinsky's (1971) hypothesis of mobility transition- proposed the hypothesis of mobility transition which paired the relationship between population dynamics thus: Rural-Urban link; Urban-Rural link; Rural-Rural link; and Urban-Urban link. The four links cause effective links on two ends in transportation system where there is point of production and the other point of consumption which facilitate the *boda boda* business in transport industry. This links forms in social life and economic perspectives. Focus on the activity of motorbikes and its associated consequences in Kenya have been laid on urban areas. The rural areas are vulnerable and most of the time forgotten. Rural transport does not have a high priority in the public transport system, let alone rural transport safety.

## **1.2 Statement of the Research Problem**

In developing countries, vehicle ownership is low; dependency on public transport is high. However the financial conditions and performance of all forms of government-organized public transport are ineffective and are in decline (Kumar, 2011). This situation has forced people and the market to develop creative solutions to address daily travel needs hence a resort to motorcycles either for personal mobility in addition to public transport. It has been shown that 6 people depend for a proportion of their livelihoods on the earnings of a typical *boda boda*

operator. Nationwide the total dependency is estimated at 1.6 million, or about 7% of the population. This excludes those with backward linkages to the industry as mechanics or suppliers of food and drink. For example, it is estimated that 40-60 *boda boda* will support a repair shop with 1-2 mechanics. Assuming similar ratios for establishments supplying food and drink suggests that a further 100,000 people might indirectly depend for a proportion of their livelihoods on the *boda boda* industry by supplying it with repair and sustenance services, (Howe, 2001). The decline in the organized public transport systems has led to a growth in largely unregulated, informally provided non-conventional public transport, the most dominant being the commercial motorcycles, which is a common form of public transport system on most secondary roads in Laikipia East Sub-county. Share taxis cannot use the footpaths and tracks that provide access to many low income urban settlements. In congested conditions the motorcycles are also valued for their ability to meander through the traffic and shorten door to door journey times and their charges are relatively cheap.

Commercial motorcycles primarily provide some types of short distance services where they serve as feeders to urban areas on routes that suffer from low density of demand and sometimes the roughness of the route may be unattractive to taxis. They also complement taxis and large capacity bus services particularly in the remote areas from the main roads where large capacity buses or trucks cannot operate. Commercial motorcycles have a provision of an on demand access and travel much further than bicycles and with high speed. Access to basic community healthcare is an essential and often a forgotten need. Regular health education, routine vaccinations and early detection of health issues such as malnutrition drives progress towards millennium development goals. Reliable transport options magnify the reach and effectiveness of existing healthcare professionals.

Olawo, *et al.*, (2014) in their study on effect of increased investment in *boda boda* business on economic empowerment of people in Kisumu west district established that the level of *boda boda* business activities was very high in the district and that these activities had a positive significant effect on economic empowerment. The study suggested that further studies should be done in other districts to establish the nationwide effect of *boda boda* business in economic



empowerment, hence the need for the research topic, “The role of commercial motorcycles in the rural economy: A case study of Laikipia East Sub-County, Kenya”.

### **1.3 Research Questions**

This study attempted to address the following questions in order to find out the significance of commercial motorcycles as one of the rural transport mode.

1. What is the role of commercial motorcycles in promoting agricultural production in the Sub-County?
2. What is the role of commercial motorcycles in poverty alleviation in the Sub-County?
3. Which factors influence the spatial distribution of commercial motorcycle in the Sub-County?

### **1.4 Objectives of the Study**

#### **1.4.1 General Objectives**

The overall objective of this study was to determine the role of commercial motorcycles in the rural economy in Laikipia East Sub-county.

#### **1.4.2 Specific Objectives**

The specific objectives were to investigate the following among commercial motorcycles in Laikipia East Sub-County:

- (i) To determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County.
- (ii) To examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County.
- (iii) To investigate the spatial distribution patterns of commercial motorcycles in Laikipia East Sub-County.

## **1.5 Research Hypotheses**

The study hypotheses were:

- Ho        There is no significant difference between promotion of agriculture and commercial motorcycles' frequency in Laikipia East Sub-County.
- Ho        There is no significant difference in contribution of commercial motorcycles (current employment) and previous occupations to poverty alleviation in Laikipia East Sub-County.

## **1.6 Justification of the Study**

The justification for the choice of this topic was backed by several reasons. This study was based on the role of commercial motorcycles on the rural economy. This development of commercial motorcycles has special significance because it has occurred in poor rural households. For the first time in African rural transport history introduction of motorcycles and the expansion of mobile phone networks have simultaneously occurred. People living in rural areas experience low levels of connectivity. Commercial motorcycles meander through almost impassable narrow paths – a common characteristic of rural roads. This advantage is perceived to be of crucial importance to the well-being of the rural people.

In developing countries, motorcycles are the most essential and effective means of transport in daily life and overall livelihood (World Bank, 2013). A review of some of the studies done shows that, Ogunsanya and Galtima (1993) did a study on the use of motorcycle as means of public passenger traffic in Yola town, Adamawa State. The study identified economic depression and inadequate transport facilities as some of the factors that gave rise to the use of motorcycles as means of public transportation in Nigeria (Ogunsanya and Galtima, 1993: 190). Adesanya (1998) focused on the evolution of motorcycles for public transportation in Ibadan. He looked at the socio-economic profiles of motorcycle operators, the characteristics of public motorcycles operations and the impact of motor bikes on passengers especially in terms of fares and safety. Another writer, Fasakin (2001) also did a study on the factors affecting the daily profits of commercial motorcycle operators in Akure, the capital of Ondo State, South West Nigeria (Fasakin, 2001: 63-69). Kayode, dealt with the subject of public transportation in his

Inaugural Lecture. Among other issues, he looked at the rise in the use of Okada for public transportation in Nigeria pointing out that the decrease in the supply of new vehicles of all types since the 1970s contributed to the emergence of motorcycles for commercial transportation (Oyesiku, 2002: 29).

The importance of commercial motorcycle in alleviating poverty is not clearly acknowledged; more often than not, it revolves around the needs such as, creating greater access to employment opportunities, educational and health facilities, agricultural development, social inclusion and networking. Some of the problems enumerated in commercial motorcycles roles in rural transport are: Lack of regulatory policies; Standardized charges or fares; Poor maintenance; Lack of skilled operators; Lack of insurance; and, lack of centralized coordination. Lack of weather protection is also commonly cited as a problem associated with the use of *boda boda*. This study differs from previous studies in the sense that it researched on the role of commercial motorcycles in the rural economy: a case study of Laikipia East Sub-County. This study unlike the other studies focuses on agricultural areas where roads are inadequate. The study area has been neglected for a long time yet it offers employment to a good number of people who are unable to secure jobs from the urban areas. Commercial motorcycles are driven on footpaths, impassable roads and also render on demand response which is crucial particularly where ambulance services are concerned hence bridging the gap between the rural and the urban population. Indeed, many unemployed youths and retired people have found gainful engagement in the commercial motorcycle business. Studies on the contribution of commercial motorcycles are limited in Kenya and other parts of the world. This study may contribute to knowledge and provide database further research.

## **1.7 Scope and Limits of the study**

### **1.7.1 Scope of the study**

The study was involved and strictly confined itself to the role of commercial motorcycles in the rural economy in Laikipia East Sub-County, Laikipia County, Rift Valley Province. Laikipia East sub-county lies to the East of Laikipia County. The Sub-county covers an area of 5570.6 Km<sup>2</sup>. The study sought to determine the role played by commercial motorcycles on the rural economy in Laikipia East Sub-County.

## 1.8 Definition of Terms

**Accessibility:** Accessibility refers to the potential of opportunities for interaction (Hansen, 1959), the ease with which any land-use activity can be reached from a location using a particular transport system' (Dalvi and Martin, 1976), the freedom of individuals to decide whether or not to participate in different activities' (Burns, 1979). In the study, accessibility measures are seen as indicators for the impact of land-use and transport developments and policy plans on the functioning of the society in general. This means that accessibility should relate to the role of the land-use and transport systems in society, which, in the researcher's opinion, give individuals or groups of individuals the opportunity to participate in activities in different locations. Focusing on passenger transport, accessibility is defined as the extent to which land-use and transport systems enable individuals to reach activities or destinations by means of a transport mode(s) (Journal of Transport Geography 12 (2004): 127–140).

**Boda-boda:** Refers to two wheeled motor vehicle whose design varies greatly to suit a range of different purposes: long distance travel, navigating urban traffic cruising, sport, racing and off-road riding (Nandwoli, 2014).

**Commuter:** Refers to journey to work, the people using joint means of public travel at a fare (Irandu, 1982).

**Intermediate Means of Transport (IMT):** These are travel means that fall between mechanized fuel and electric propelled machines such as vehicles, ships, aircrafts and walking. They include bicycles, tricycles and animal drawn carts (Irandu, 1997).

**Mobility:** The movement of individuals or groups from place to place, job to job, or one social or economic level to another (*www.thefreedictionary.com* [1375–1425; late Middle English, Latin]) website visited on 25<sup>th</sup> February, 2015.

**Poverty:** poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility

to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation (UN, 1998).

**Public Service Vehicle (PSV):** One that satisfies the Transport Licensing Board Act Cap 404. It is required to have a defined route, regular time table and fixed fare structure (Irandu, 1982).

**Trip:** Is a one way person movement with an origin (O) and destination (D).

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

In this chapter the researcher aims at reviewing the works done by other scholars in line with the topic. This enables the researcher to be conversant with related work done, getting insights of further suggested research gaps and to avoid duplication.

### **2.1 Emergence of Commercial Motorcycles**

The first commercial design for a self-propelled bicycle was a three-wheel design called the Butler Petrol Cycle, conceived of and built by Edward Butler in England in 1884. He exhibited his plans for the vehicle at the Stanley Cycle Show in London in 1884; two years earlier than Karl Benz invented his first automobile and was generally recognized as the inventor of the modern automobile. Butler's vehicle was also the first design to be shown at the 1885 International Inventions Exhibition in London (Foale, 2006).

The most recent - and arguably the most dramatic - change in rural transport services in many countries has been the expansion of motorcycle-taxi services, which gathered pace in the 1990s. These are still penetrating remote rural areas today, fuelled particularly by the availability of cheap imported Chinese motorcycles. Large areas remained un-served by all-season roads and thus often inaccessible to motorized transport services. Consequently, the vast majority of produce for home consumption was head loaded. In most cultural contexts, porter age was seen principally as work for women and their children. Women and their children, however, have continued to play a dominant role not only in intra-village goods transport but also in much intra-settlement. Motorcycle development has special significance because it has occurred at roughly the same time as the expansion of mobile phone networks and the acquisition of handsets even in poor rural households (Gina, 2013).

In rural Africa it is women who bear the greater part of the transport burden. Understanding their transport patterns is a first step in aiming to reduce their onerous task. In general, the transport efficiency of rural households can be enhanced in two ways: by increasing mobility through improvements in the rural transport system; and by locating facilities and services closer to

people to reduce the distance that they need to travel. Recognizing that in many of the poorest areas of rural Africa, domestic travel for water, firewood and food processing needs accounts for the major share of women's transport burden. In order for the interventions to have a long-term positive impact on women, women have to be involved in all stages of planning, from the selection of priority interventions to planning for implementation and subsequent maintenance (Jean, 1994).

However, Fasakin (2001) study of the use of commercial motorbikes as means of public transportation in Akure, Ondo state of Nigeria was focused on the factors affecting the daily profits of commercial motorbike operators while Olubomehin (2012) study was concerned with the historical perspective of motorcycles (Okada) as a means of public transportation and its impact on the economy and society with particular reference to Lagos, Nigeria.

People in Uganda and elsewhere in the world appreciate the need to popularize and recognize non-motorized mobility particularly the bicycle as a suitable, convenient, environmentally friendly and critical tool in national social economic development (Fabio, 2000). The youth quickly realized that the same bicycles they used to carry goods from Kenya to Uganda and back could also ferry people in the transportation of people from poor villages of Western Kenya. With an estimated 90 percent of Kenyan roads not being paved, according to the 2001 budget report on rural development, and many roads being impassable by vehicles, the *boda boda* has become a versatile, quick, and reliable form of transportation.

Kenya was one of the first countries in Sub-Saharan Africa to realize that high tariffs on the import of bicycles was damaging to the interests of ordinary people. Import duties on bicycles in Kenya were progressively reduced from 80% down to the present level of 10%. The result has been a surge in bicycle use. In Western Kenya a unique 'commercial' form of non-motorized transport –the *boda boda*– has emerged. The use of *boda-boda* has expanded in towns like Busia, Bungoma, Kakamega, Kisumu and Ahero. Studies by the World Bank show that the *boda bodas* result in a significant increase in income to those lucky enough to own or operate them. They give a boost to local trading and service economies and directly create secondary employment (National Forum Group, 1996).

Heyer, J. *et al.*, (1970) in their study of rural development in Kenya found out that areas which generally produce more crops have a more developed road network. Various factors are associated with accidents including alcoholic and high speed driving. Drivers' negligence is another major contributing factor to accidents and these include reckless driving, improper overtaking and disregard for traffic light. Such causes may have had alcohol consumption as an underlying factor (Odero *et al.*, 1997).

Development is a complex, holistic, and multi-dimensional process which goes beyond mere economic growth and integrates all the dimensions of life and all the energies of a community, all members must share in the benefits that result there from. The principle is therefore proposed that development must be founded on the will of each society and express its profound identity. (UNESCO,1982).

The *boda-boda* taxis are part of the African bicycle culture; they started in the 1960s and 1970s and are still spreading from their origin on the Kenyan - Ugandan border to other regions. The name originated from a need to transport people across the "no-man's-land" between the border posts without the paperwork involved with using motor vehicles crossing the international border. This started in the southern border crossing town of Busia (Kenya/Uganda), where there is over half a mile between the gates, and quickly spread to the northern border town of Malaba (Kenya). The bicycle owners would shout out *boda-boda* (border-to-border) to potential customers - not to be confused with *poda-poda*, which is a form of shared taxi in Sierra Leone (Kokwaro, 2013).

While the *boda-boda* bicycle is still spreading to other areas, in its area of origin, especially in cities in Kenya and Uganda, the bicycles are more and more replaced by motorbikes. The motorbike-taxis have taken the name *boda boda* as well. In 2004 it was estimated that more than 200,000 people in Uganda were working as bicycle *boda boda* and already almost 90,000 as motorized motorbike *boda boda*.

## **2.2 Role of Commercial Motorcycles**

When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets,



employment and additional investments. Moving to places of work fast and in a much convenient manner increases working hours and increased productivity leading to better economic livelihoods. Commercial motorcycles provide cheaper and affordable means of transport. The motorcycle is fast becoming the only way to move quickly through congested urban traffic and the only affordable personal transport in the developing world where motor vehicle may cost more than a worker earns in a decade. Motorcycles have been formally neglected by transit planners in almost every country on the globe. Only China and a few western European nations collect transportation data that count motorcycles among forms of transport (Marcia, 1991).

Rapid access to medical assistance is particularly important in reducing perinatal maternal and infant mortality which is especially high in Sub-Saharan Africa. The risk of dying in childbirth is about 36 times higher for mothers in developing countries than for those in industrialized countries. Most developing countries lack both the necessary infrastructure and the means of transport to transfer pregnant women promptly to hospital or to enable a midwife to travel to the place where the woman is giving birth (Babinard, *et al.*, 2010).

Riding a motorcycle has many advantages over a car. Motorcycles are cheaper to run, easier to repair, easier to park, more flexible in traffic, less boring and can stop anywhere – thus providing a door-to-door service. Motorcycle, indeed, stands as a new evolution in public transportation that needs to be given needed attention. Many factors have been responsible for the growth of the use of motorcycles for commercial transport in recent years. These are the poor state of roads in many developing countries and the inability of bus companies to meet growing demand. The increasing growth in the number of motorcycles has come to solve the mobility needs of many rural dwellers in the light of poor and inadequate public transport system, poor road conditions particularly those leading into the peri-urban areas where many people in Laikipia East reside as a result of urban sprawl. It also comes along with a host of opportunities including employment to motorcycle mechanics and motorcycle spare parts dealers, local revenue generating sources through taxes on motorcycle riders as well as motorcycle registration and licensing. The major retailers have in the past offered a limited credit of about 5% of the purchase price and retained the registration papers until the debt has been cleared. The study investigates the role of commercial motorcycles in rural economy in Laikipia East Sub-County (Howe, 2001).

### **2.2.1 Employment Creation**

Drivers and vehicle licensing of motorcycles generate revenue. Municipal Council bye-laws require that all motorcycle owners buy and stick stickers on their motorcycles. Court fines from deviant motorcyclists contribute to revenue generation. A good number of mechanics, commercial motorcycle spare parts dealers and increased number of fuel filling stations derive their livelihoods and operations on commercial motorcycles. Studies show that almost 50% of motorcycle riders are from various backgrounds but cannot find employment within their fields. Thus motorcycle ridership business serves both as temporary employment and as a means for entrepreneurs to earn capital to start businesses.

### **2.2.2 Agricultural Advisory Services**

In any strategy for promoting the economic development of rural areas the agricultural sector is particularly important. This is partly in view of the availability of land which is suitable for agriculture and partly because of the direct use of agricultural products for human nutrition. Agricultural inputs such as fertilizer and others are not the only means of boosting agricultural productivity; innovation and knowledge gained from experience are also important and both can be passed on through agricultural advisory services. The accessibility of training, advice and information centres and the cost of using such services are important factors in the decision-making process for farmers who are considering whether to invest in training and advice.

Conversely, the accessibility of farms is a factor that influences the cost of providing advice when a visit to the farm is needed. Better accessibility also significantly increases an individual farmer's prospects of being able to partner with research institutes in the innovation process. It has also been shown that mobility increases access to innovations, technology and knowledge through the sharing of experience.

### **2.2.3 Agricultural Production and off-farm Activities**

All over the world, agriculture in rural areas is a key provider of the population's income and plays a vital part in regional development. In most African, Asian and Latin American countries, about 90% of rural households are involved in farming in one form or another. On average they obtain between 70 % (Africa) and 50% (Asia, Latin America) of their household income from farming activities (Davis *et al.*, 2010). To promote these income-earning opportunities, expansion of the rural transport infrastructure often focuses on developing small farmers' access

to the market, to improve their marketing opportunities and the supply of inputs. Where transport routes do not exist or roads are in poor condition, goods cannot always be transported; if transport is possible, the costs may be very high. Seasonal interruptions to transport links are common, for example as a result of flooding in the rainy season; if roads are impassable, goods cannot be transported. Important, yield-boosting inputs such as fertilisers, and farm machinery can be obtained more easily and more cheaply if there are good transport links to rural centres and markets. An example from Ethiopia shows that households with good access to roads do not necessarily use more fertiliser than the comparison group with less good access, but they pay about 17% less for it (Arethun and Bhatta, (2012).

Transport of fertilizers from the market to the farms in the rural area requires cheap and affordable prices. This enables farmers to achieve economies of scale. Commercial motor cycles have enabled cheap and fast acquisition of fertilizers in the agricultural fields. They provide affordable and cheap transport since motor vehicles cannot cope with the high demand of transport in the rural areas due to the impassable tracks and roads especially during the rainy seasons. Farming as a primary source of income has failed to guarantee sufficient livelihood for most farming households in developing countries, and agricultural development policies have largely produced little improvement. Diversification into off-farm activities has become the norm. While the poverty and inequality effects of off-farm income have been analyzed in different developing countries, much less empirical studies have been conducted on the impact of off-farm income on agricultural production and efficiency. In this study off-farm earnings are defined as income generated by households from any non-agricultural income generating enterprises such as artisanal activities, metalwork, transportation or any other informal businesses, as well as transfers and remittances.

#### **2.2.4 Poverty Alleviation**

Motorcycling is life enhancing; contrary to the conventional wisdom that motorcycling is for those who are careless of life. The view that motorcycling is life enhancing has two aspects: It provides transport, which enhances lifestyle by increasing the range of available activities; It is also an enjoyable experience, that can be engaged in for its own sake. The advantages of motorcycling as a form of transport to work are not restricted to its being cheap, it is also more

convenient than motor transport in terms of avoiding traffic jams and parking problems. Motorcycling also provides transport to leisure activities. The most important attribute of motorcycling was independence and freedom of mobility. Unemployment and poverty are two basic problems plaguing many developing nations of the world (ILO, 2007).

The distribution of water sources is uneven across the Laikipia County with the northern parts experiencing serious water shortages. There are 41 per cent households accessing water from within their dwelling while 12.9 per cent of the households take an average of 1- 4 minutes to reach the nearest water point. Similarly 20.3 per cent of households take an average of 5-14 minutes and 11.4 per cent of the households take an average of 15-29 minutes. The remaining 4.6 per cent of the households takes over an hour to reach the nearest water point. Fetching water is one of the activities carried out by commercial motorcycles in Laikipia East sub-county (Vision, 2030).

### **2.2.5 Rural transport and the Millennium Development Goals (MDGs)**

The first MDG is on “Eradicating Extreme Poverty and Hunger” the goal in this case is met through provision of access to the markets for agricultural produce by commercial motorcycle transport in the rural areas of Laikipia East Sub-County. The riders secure employment through transport of agricultural produce from the farms to the market centers. Cheap means of transport of agricultural produce from the farms to the market centers ensures affordable and stable prices of agricultural commodities and hence food security occurs. Post harvest losses are also minimized and controlled due to the rapid access to the market centers. Post harvest losses are the portion of the harvest that is taken from the field but is lost before it reaches the consumer via the market. The African Post harvest Losses Information System estimates that in Sub-Saharan Africa between 10 and 20 per cent of the grain harvest is lost between harvesting and processing (Hoering, 2012).

The second MDG is on “Universal Primary Education”. Rural roads in Laikipia East Sub-County are impassable during rainy seasons. Access to schools for children and teachers is made possible by commercial motorcycles which sometimes pass on planks of wood when bridges are swept away by floods. The third MDG is on, “Gender equality”. By improving women’s

mobility through commercial motorcycle's transport services the requirements of the MDG are addressed. Commercial motorcycles are able to access rural medical care which falls under the MDGs 4 and 5 which is on, "Reducing child mortality and improving maternal health". The sixth MDG is on "Combating HIV/AIDs, Malaria and other serious diseases". Access to medical care and reducing the spread of disease along transport routes in the rural areas of Laikipia East Sub-County is achieved through commercial motorcycles and other intermediate modes of transport such as bicycles which are used as ambulances in the impassable areas of the Sub-county. The seventh MDG is on "Environmental Sustainability". In the Sub-county preventing of adverse impacts of transport infrastructure on flora and fauna is quite important as the Sub-county falls under Agro-ecological Zone IV which is sub-humid, semi-arid and arid habitats where large percentage of the Sub-county lies on 22 – 26<sup>0</sup>C. Zone IV lies between 1500-1800 m and are considered as transitional areas between the humid environments and the drylands. The zone has a medium agricultural potential with indicator crops such as wheat, barley but are characterised by the highest density and diversity of wildlife in Kenya. Other activities include ranching and game cropping. Access by people monitoring illegal logging and pursuing poachers is quite important. This is mainly carried out in the forest where there are no well-established routes and therefore commercial motorcycles become quite useful. The Sub-county is on the leeward position North West of Mount Kenya massif which is comparatively dry despite its location on the equator (Kohler, 1987, Wiesmann, 1998, Ledermann, 2003).

### **2.3 Research gaps**

There has been little research conducted on rural transport business operations, such as the role of transport operator associations in route designation, fare setting, timetabling, training, road safety and driver/passenger interactions with police and other relevant actors. This is an important gap which needs to be filled to complement work from user and policy perspectives (Gina, 2013). One important feature of this informal transport mode is the fact that most of the operators used it as a source of 'last resort employment'. Most of them left their previous employments especially in the informal sector due to poor or low earnings for the motorcycle business. This therefore creates another research gap on whether on the daily average they now earn higher in motorcycle operation than in their former informal jobs. The resolution of this research gap was one of the rationales for this study.

## **2.4 Theoretical Framework**

### **Functional theory**

Functionalist theory denotes the fundamental metaphor of the living organism, its several parts and organs, grouped and organized into a system, the function of the various parts and organs being to sustain the organism, to keep its essential processes going and enable it to produce. Similarly, members of a society can be thought of as cells, its institutions, its organs, whose function is to sustain the life of the collective entity, despite the frequent death of cells and production of new ones. Functionalist analyses, examine the social significance of phenomena, that is, the purpose they serve a particular society in maintaining the whole (Jarvie, 1973). Functionalism sought to be a corrective to the excesses of the evolutionary and diffusionist theories of the nineteenth-century and the historicism of the early twentieth century (Goldschmidt, 1996).

Equally commercial motorcycles emergence can be seen as a corrective measure of impassable roads which were almost like footpaths, broken bridges and unpaved roads. For the society to be held together as a whole agricultural production has to be taken to the market centres and agricultural inputs has to be taken to the farms.

### **Human capital theory**

The theoretical foundation for this study is the human capital theory (HCT) where Becker (1962) and Mincer (1974) view education and training as the major source of human capital accumulation that, in turn, have direct and positive effect on individual's life time earnings. The human capital theory serves as the theoretical framework for analyzing earnings. Resources such as education, training and experience can increase a worker's productivity and earnings (Berker 1962; Mincer 1974). Berker (1960), further contends that physical capital and labour market experience plays the strongest role in the income generating process for self- employed. Human Capital is described further by Mincer, 1974, to mean productive investments embodied in human persons. These include skills; abilities; ideas; resulting from expenditure on education and on-the-job training. In this connection, to operate in the informal sector some form of skills, abilities, ideas and training are needed in order to enhance productivity that will in turn guarantee employment and earnings. This is reflected in some informal sector activities like tire repair

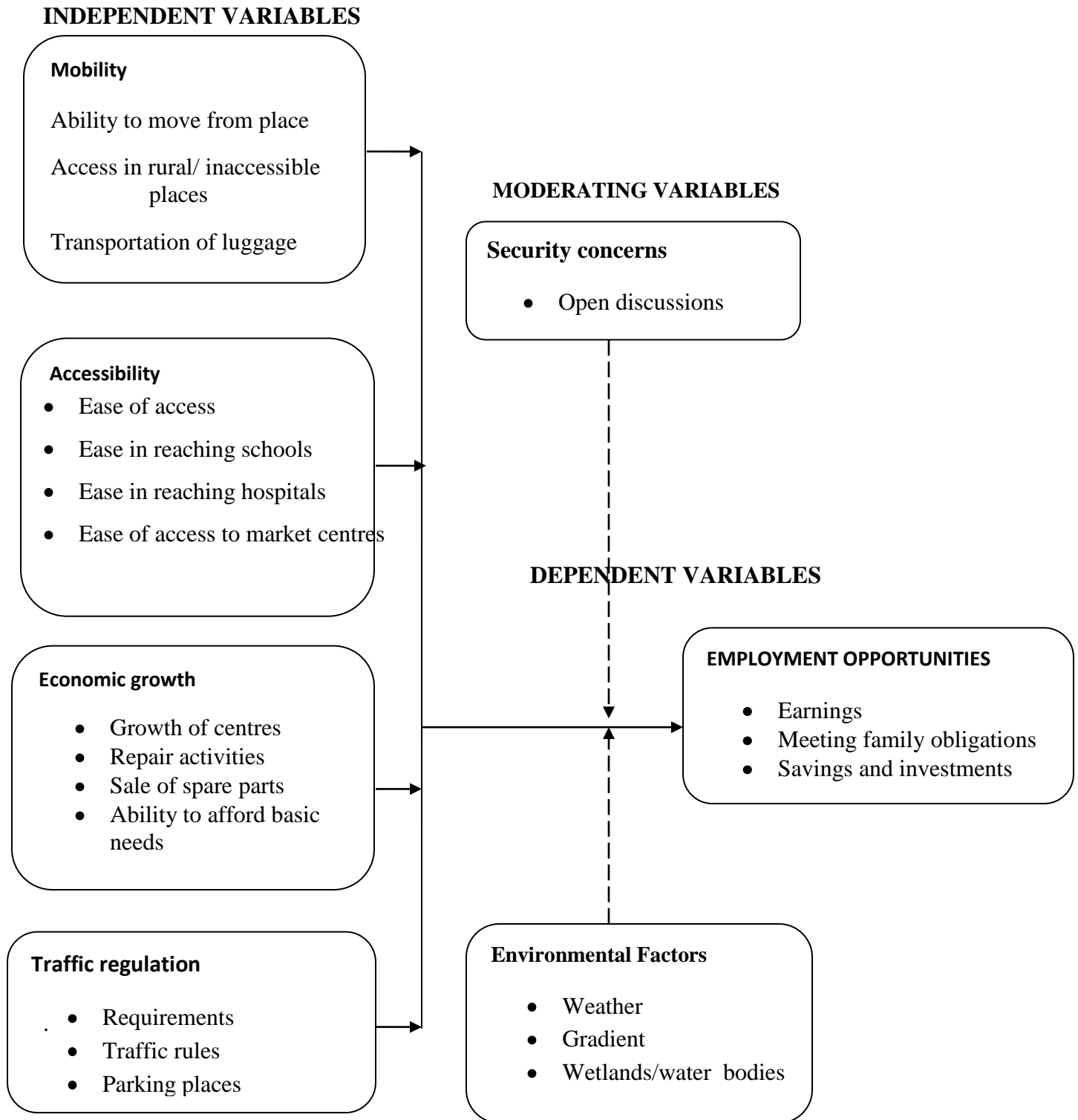
business; motor/motorcycle mechanic; and hairdressing where one need to undergo apprenticeship training to become self-employed. However, the commercial motorcycle business requires skills, ideas; and abilities to operate in order to generate employment and income.

Accessibility planning as a tool and greater accessibility as a goal are potentially powerful drivers of policy because they require that policy sectors interact, otherwise the goal of achieving greater accessibility as a means of greater social inclusion and social justice cannot be fully attained. Accessibility refers to the design of products, devices, services, or environments for people with disabilities. The concept of accessible design ensures both "direct access" (i.e. unassisted) and "indirect access" meaning compatibility with a person's assistive technology. The key role of motorcycles in Laikipia East Sub-County is to transport goods and passengers. This sustains the essential processes and enables realization of the socio-economic goals to be achieved. In an increasingly hostile environment characterized by aggressive and distracted drivers, motorcyclists have been charged to be wiser, more skilled and more educated in order to enhance their survival in cases of traffic accidents. Merton attempted to clarify the concept of function by distinguishing latent and manifest functions. Latent functions are those objective consequences of a cultural item which are neither intended nor recognized by the members of a society. Manifest functions are those objective consequences contributing to the adjustment or adaptation of the system which are intended and recognized by participants in the system (Kaplan and Manners 1972).

Mobility is a contemporary paradigm in the social sciences that explores the movement of people, ideas and goods, as well as the broader social implications of those movements. Transformation in the social sciences began in the 1990s in response to the increasing realization of the historic and contemporary importance of movement on individuals and society. This has been driven by generally increased levels of mobility and new forms of mobility where bodies combine with information and different patterns of mobility. The paradigm incorporates new ways of theorizing about how these mobilities lie, "at the center of constellations of power, the creation of identities and the microgeographies of everyday life." (Creswell, 2011). Sustainable mobility is the ability to meet society's desires and needs to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values, today or in the future.

Accessibility can be measured by the number of travel opportunities or destinations within a particular travel radius, measured in terms of either travel time or distance. On the other hand, mobility is a measure of the ability to move efficiently between origins and the destinations. Thus mobility is directly influenced by the layout of the transportation network and the level of service it offers. Land development generates travel, and travel generates the need for new facilities, which in turn increases accessibility and attracts further development. Government transport projects are normally planned to improve safety, decreasing travel time by alleviating congestion and achieve other mobility related goals. Increased access to land raises its potential for development and more development generates additional travel. Other factors that influence large changes in land development patterns include overall population and economic growth, individual preferences and lifestyle choices, other infrastructure, changing technology, local planning and zoning policies and geographic and topographic conditions.





Source: Adopted from Nandwoli (2014)

Figure 2.1: Conceptual framework

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter discusses the methodology used in the study, the research design, location of the study, position and size of Laikipia East Sub-County. The research methodology presents the structural framework upon which data collection and analysis is based. It gives the location where the study is carried out, the research design, the population targeted for the study, the sample selection procedures, the instruments to be used in collecting data, how the instruments were pre-tested for validity and reliability, and how the data was collected and analyzed.

### **3.1 Study Area**

#### **3.1.1 Location and physiographic features**

Nanyuki Town is the Laikipia County headquarter. It is an important centre within the study area. It is located on the main highway from Meru to Nairobi. Nanyuki's market for agricultural produce is not specialized on a specific commodity; there is a variety of different products, mainly vegetables, potatoes and beans. Most small scale farmers sell their produce in Nanyuki Town. The large scale farmers take their products to Nairobi, since they produce for larger markets and for export (Wamugunda, 2010).

Laikipia County is one of the 47 counties in the country. It comprises of three administrative sub-counties namely Laikipia East, Laikipia North, and Laikipia West (the sub county units are geographically equivalent to the constituencies). The sub county headquarters are at Nanyuki, Doldol, Rumuruti and Nyahururu respectively. The county is further sub-divided into 15 divisions, 51 locations and 96 sub-locations respectively. The Laikipia East sub-county lies to the east, Laikipia North to the North, Laikipia Central to the south east, and Laikipia West to the west of the county. According to the National Census program that was carried out in 2009 the population of Laikipia county is estimated to be around 399,227. 60% of the population in the county is from the Kikuyu and Meru communities while the rest is divided between the Maasai and other pastoral communities. 24.8% of the population resides in the urban areas in the county. The county has three sub-counties namely:- Laikipia East; Laikipia West; and Laikipia North.

### 3.1.2 Climatic Conditions

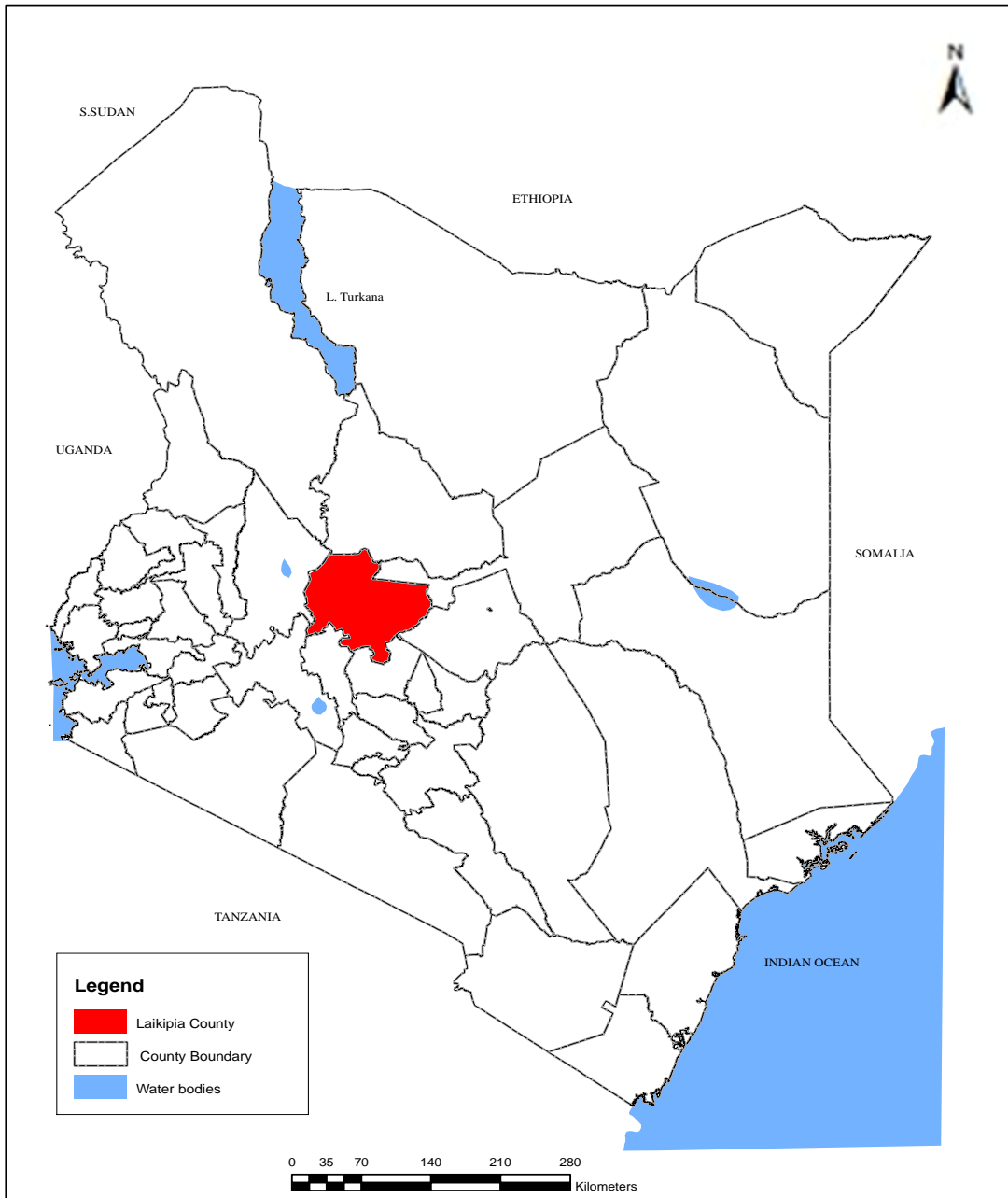
The climatic patterns experienced in Laikipia East Sub-County are attributed to the proximity of the county to Mt Kenya and the Equator. The area experiences high temperatures in most parts of the year with an average temperature of 25 degrees Celsius. The county has a cool, temperate climate with both rainy and dry seasons. The Sub-county experiences bimodal type of rainfall whereby the long rains occur between March and May while the short rains are usually experienced between October and November. The average amount of rainfall received is approximately 400mm in the east parts of the county while the western part receives 1000mm per year. The difference in rainfall contributes to the diverse agricultural activities carried out in the area. These patterns are subject to change if the necessary measures to mitigate climate change and global warming are not implemented in time.

The area has a high altitude of 1700-2600mm and this contributes to the cool temperatures experienced in some parts of the county. The county is a plateau hence soil erosion is not a major problem here, however deposition of materials from the uplands is very common. Soils are volcanic with high water holding capacity. In the western part of the county the soils are very fertile and this enables the residents to plant many crops on the land. Most feeder roads in the Laikipia East Sub-County are impassable during rainy seasons.

**Table 3.1: Mean Annual Rainfall in Millimeters 2008 – 2012**

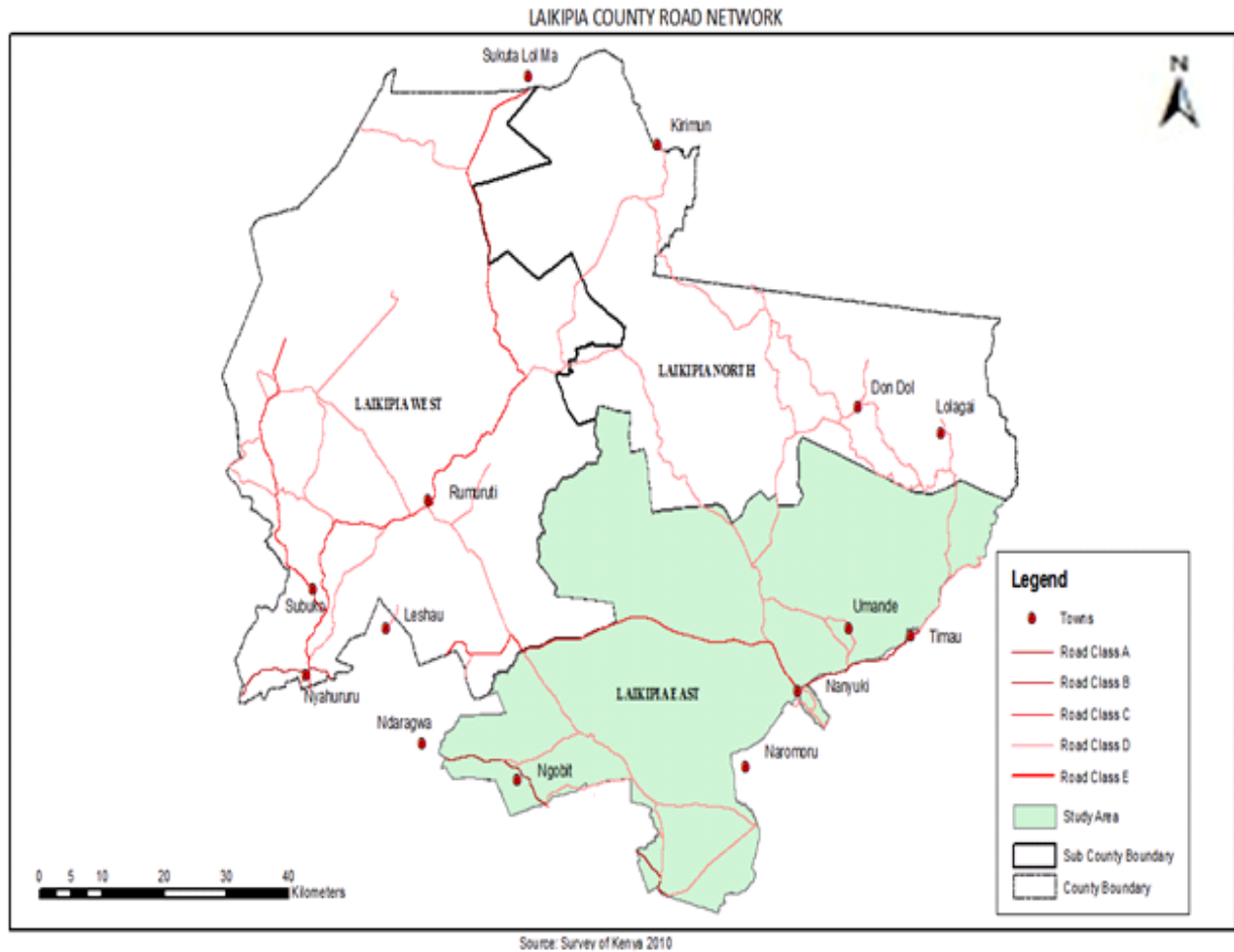
<b>Station</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Dol Dol	456.25	298.3	560.8	169	545
Rumuruti	741.4	535.1	1069.1	1342	822
Nyahururu	812.2	635.8	1375.3	1201.2	1500
Nanyuki	726.7	292.1	1411.2	896.9	857.1

**Source:** Laikipia Meteorological Stations, 2012



Source: Survey of Kenya 2011

**Figure 3.1: Map of Laikipia County in Kenyan map**



**Figure 3.2: Map of Laikipia County Road Network**

### 3.1.3 Socio-economic characteristics of Laikipia East-Sub County

#### 3.1.3.1 Transport Network

The total classified road network is 1,038.1 Km of which over 80 percent are feeder roads. The bitumen surface in the county stand at 139.3 Kilometers, covering mainly the Nyeri - Nanyuki, Nyeri - Nyahururu, and Nyahururu – Kinamba-Rumuruti roads. The gravel surface stand at 296.9 Km and the earth surface at 601.9 Km. whereas the main urban centres are relatively well served by road communication network; the rural areas have low access hence movements to the major urban centres is hindered. The railway network in the county covers 23 kilometers serving Nanyuki Town and a small stretch of about 2 Kilometers in Nyahururu Town. There are 5 airstrips across the county majority of which are managed by the private ranching community.

Laikipia County’s economy is based on agriculture and livestock. Most parts of the road network is impassable during the rainy seasons. Without proper training on how to ride, the motorcycle riders are bound to be involved in many accidents. This is because motorcyclists often share the traffic space with fast-moving cars, buses and trucks. In addition, their lack of physical protection makes them particularly vulnerable to fatal injuries on collision. Motorcycle riders are at an increased risk of being involved in a crash (ACEM, 2004).

### 3.1.3.2 Agricultural patterns

Farmers in Laikipia East Sub-County rely on subsistence agriculture as their livelihood source which depends on the amount and distribution of rainfall. The main growing season occur during the peak rainfall season which occurs between March and May. Short rain season occurs between October and December. Subsistence agriculture in the study area depends entirely on rainfall performance. Although there are other factors such as high costs of production, poor market prices, reduced farm land sizes due to population pressure, which contribute to the decrease in agricultural productivity, changes in rainfall patterns plays the key role since agriculture in the Sub-County is rain-fed. Changes in rainfall patterns alter farming activities with overall negative effects on the final yields.

### 3.1.4 Unemployment levels

The youth forms the bulk of the unemployed labour force Laikipia East Sub-county. This is attributed to low industrial base, inadequate skills and poor attitudes towards self-employment. The percentage of the population seeking employment was 7.8, 13.2 and 7 in Laikipia East, Laikipia North and Laikipia West sub counties respectively in 2009 as shown in the Kenya Population and Housing Census, August 2009.

**Table 3.2: Laikipia East Sub- County Demographic Data**

Male	Female	Total	Number of Households	Land Area (sq.km.)	Density (Persons)
88,576	86,220	174,796	47,409	5,570.6	31

**Source:** Kenya Population and Housing Census, August 2009

**Table 3.3: Laikipia East Sub- County Locations**

<b>Ward</b>	<b>Approximate Population</b>	<b>Approximate Area in Sq. Km</b>	<b>Sub-Locations</b>
Ngobit	23,978	271.20	Withare, Wiyumire, Kariguini, Mutaro, Muhonia, Njoguini, Ruai, Wamura and Nyambogichi
Tigithi	27,062	562.00	Lamura and Matanya
Thingithu	20,836	103.50	Thingithu and Marura
Nanyuki	28,485	36.00	Ntukuruma, Likii and Majengo
Umande	16,201	289.10	Umande, Kalalu and Nyariginu

**Source:** Kenya Population and Housing Census, August 2009

### **3.2 Research Design**

Maxwell (1996) defines a research design as “a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings”. Research design provides answers to issues such as techniques to be used to gather data, the kind of sampling strategies and tools to be used and how to deal with time and cost constraints (Cooper and Schindler, 2003). Kathuri and Pals, (1993), indicated that survey research usually use questionnaires in order to determine the opinion, attitudes, preferences, and perception of groups of people of interests in research. Both qualitative and quantitative data will be obtained. Qualitative data collection aims at gathering in-depth understanding of events, occurrences and behaviour of the group under research (Mugenda & Mugenda 2012).

### **3.3 Target population**

Burns and Grove (2001) describe population as all the elements that meet the criteria for inclusion in a study. The target population includes all stakeholders who are involved in commercial motorcycle business (*boda boda*) in Laikipia East Sub-county in the following administrative sub-divisions: Ngobit, Tigithi, Thingithu, Nanyuki, and Umande.

### 3.4 Sources of Data

The researcher collected data from two sources: primary sources of information which was obtained from the field and they included interviews, observation and questionnaires among others. The secondary sources of data included research from other projects, journals, books, literature review of other books.

### 3.5 Sampling Technique

The study involved commercial motorcyclists in Laikipia East Sub-County whose representative sample was obtained from randomly selected commercial motorcycle parking points. The study area was subdivided into 5 administrative units/locations and stratified simple random sampling technique was used to select a representative sample from commercial motorcycles' parking points. In this type of sampling the sample unit or population was stratified into 5 strata or sub-populations before a selection of a simple random sample from each population or stratum (Reza, 1988).

The sample size of each stratum is proportionate to the population size of the stratum. Strata sample sizes are determined by the following equation:  $n_h = (N_h / N) * n$

where  $n_h$  is the sample size for stratum  $h$ ,  $N_h$  is the population size for stratum  $h$ ,  $N$  is total population size, and  $n$  is total sample size.

**Table 3.4: Distribution of sample size according to locations**

<b>Location</b>	<b>Sample size</b>
1. Umande	5
2. Nanyuki	26
3. Thingithu	9
4. Tigithi/Matanya	13
5. Ngobit	13
<b>Total</b>	<b>66</b>

**Source:** Field Data (2015)



### 3.6 Sample size

A sample size is the number of respondents needed in any given study to give an accurate representation of the attitudes, opinion, beliefs, habits or characteristics of a given population. The appropriate sample size to be used is directly related to the type of research that is being accomplished. The accuracy of the research conducted tends to improve as the sample size increases. Determining sample size is a very important issue because samples that are too large may waste time, resources and money, while samples that are too small may lead to inaccurate results. In many cases, we can easily determine the minimum sample size needed to estimate a process parameter, such as the population mean. When sample data is collected and the sample mean is calculated, that sample mean is typically different from the population mean. Stratified sampling was used to sample the location of *boda boda* operators. Simple random sampling was used to sample *boda boda* operators. The sample size was determined using the following formula.

$$n = (NCv^2) / (Cv^2 + (N - 1) e^2) \dots\dots\dots \text{Nassiuma (2002).}$$

- Where, n = the desired sample size,
- N = Target population.
- Cv = Coefficient of variation (take 0.5).
- e = Tolerance at desired level of confidence (0.05) at 95% confidence level.

#### Sample size equation

$$n = (NCv^2) / (Cv^2 + (N - 1) e^2)$$

$$n = 153 \times 0.5^2 / 0.5^2 + (153-1)e^2)$$

$$n = 153 \times 0.25 / 0.25 + 152 \times 0.05^2$$

$$n = 38.25 / 0.25 + 0.38$$

$$n = 38.25/0.63$$

$$n = 60.7$$

$$\mathbf{n = 61}$$

Structured and unstructured questions were used to gather the complimentary information. Key informants were used to generate the target population since it was not available. Target population was established to be 153 out of which the 61 motorcyclists were selected and interviewed.

### **3.6.1 Hypotheses Testing**

The study hypotheses were tested using Chi-Square and Spearman's Rank Correlation Coefficient. The chi-square test is based on a test statistic that measures the divergence of the observed data from the values that would be expected under the null hypothesis of no association. This entails calculation of the expected values based on the data. Using the formula below, the two hypotheses were tested to determine whether there was a significant difference.

$$(\chi^2) = \sum (O - e)^2 / e$$

Chi-square ( $\chi^2$ ) test

Where, ( $\chi^2$ ) is the Chi-square

$\sum$  is the summation

O is the observed values

e is the expected values

## **3.7 Data collection**

### **3.7.1 Questionnaire**

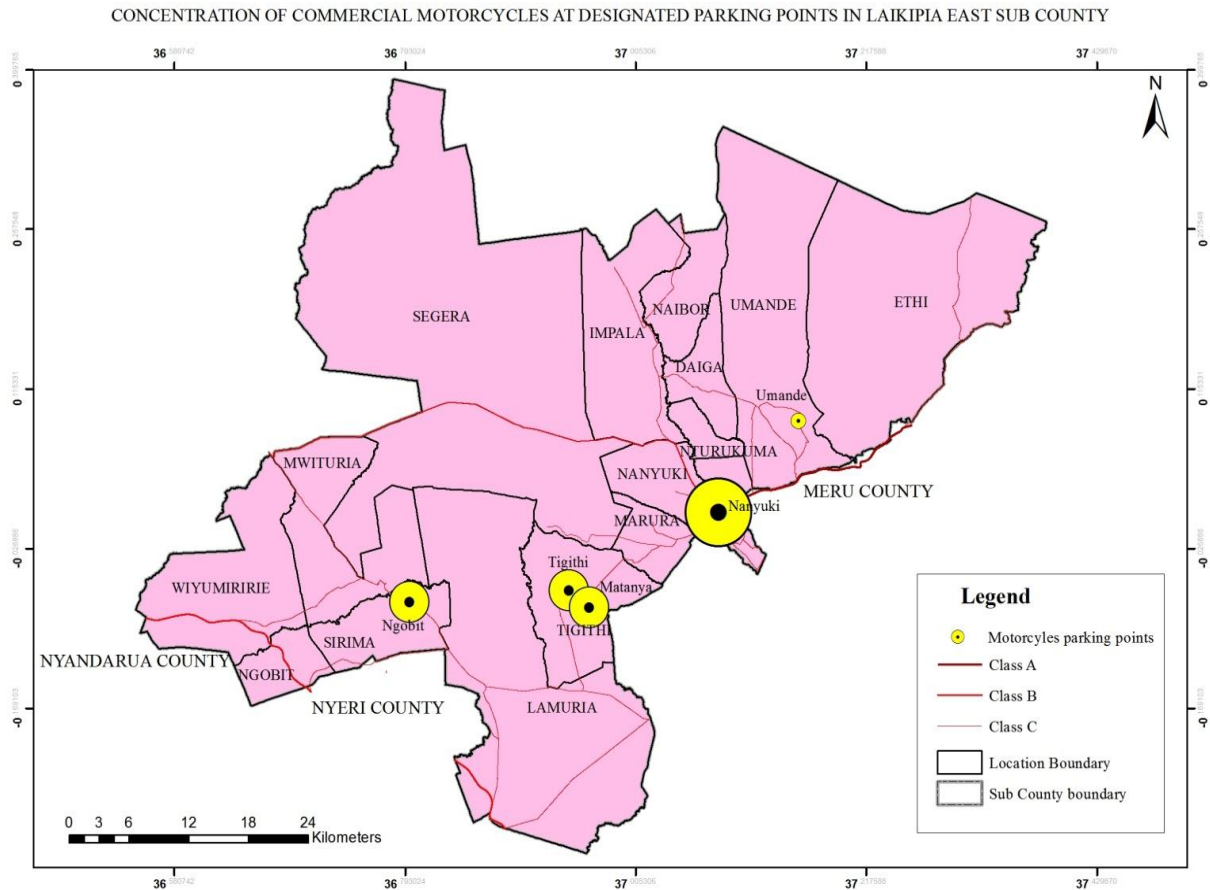
The interviews were semi-structured and involved a series of focused but open ended questions to the *boda boda* operators. This was the survey instrument used to interview the respondents in the study area.

### **3.7.2 Key informants interview**

Key informants were contacted to validate and elaborate information provided by the respondents. The quality of key informant interviews rests largely on choosing the right informants. The most important consideration is that informants possess an intimate knowledge of the subject on which they were interviewed. Such knowledge may be based on their special social positions, experience, participation in the project or programme, or professional expertise.

A typical key informant is therefore very different from a typical respondent in sample surveys because of the depth of his or her knowledge and experience.

### 3.7.3 Spatial distribution pattern of commercial motorcycles



Source: Field Data, 2015

**Figure 3.3: Map showing the spatial distribution of commercial motorcycles parking points in the study area**

### 3.8 Data analysis

Data coding was done whereby categories of responses were identified, assigned, classified and then recorded on a prepared sheet as per research questions or objectives of the study. Descriptive statistics and inferential statistics were performed using the Statistical Package for Social Sciences (SPSS) and EXCEL programmes to produce mean scores, frequencies,

percentages, Chi-square and correlations. The analyzed data was presented in form of pie-charts, bar charts, frequency and percentage tables accompanied by appropriate descriptions or explanations.

### **3.8.1 Chi-square ( $\chi^2$ ) Test**

Chi-square test measures the discrepancies between observed and expected frequencies and is a non-parametric technique. The technique was used because the population used was not normally distributed. Non parametric procedures can be used to treat data which have been measured on nominal scales. Chi-square test requirements include: sample must be drawn randomly from the population; data must be in form of frequencies for each of the category; the observed must be equal to or more than 20; the measured variables must be independent i.e. none of the variables must influence the other; the expected frequency must be more than 5.

Chi-square has some weaknesses such as: It is sensitive to sample size in that the observed and expected frequencies must not be too small as this would compromise the validity of the results; the test is not applicable to dependent variables; and the test does not show the strength of the relationship between variables.

### **3.8.2 Spearman's Rank Correlation Coefficient**

The Spearman's Rank Correlation Coefficient is used to determine the strength of a link between two sets of data. Spearman's Rank Correlation Coefficient assesses how well an arbitrary monotonic function can describe a relationship between two variables, without making any assumptions about the frequency distribution of the variables. Spearman's rho limits the outlier to the value of its rank. If  $Y$  tends to increase when  $X$  increases, the Spearman correlation coefficient is positive. If  $Y$  tends to decrease when  $X$  increases, the Spearman correlation coefficient is negative. A Spearman correlation of zero indicates that there is no tendency for  $Y$  to either increase or decrease when  $X$  increases. The Spearman correlation increases in magnitude as  $X$  and  $Y$  become closer to being perfect monotone functions of each other. Coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association; and coefficients above .50 represent a large association or relationship.

The following formula was used to calculate the Spearman rank correlation:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Where:

P = Spearman rank correlation

di = the difference between the ranks of corresponding values Xi and Yi

n = number of value in each data set

### **3.9 Limitations of the Study**

There was no financial sponsorship for the study. This forced the researcher to cut down the number of the Research Assistants required to only one. This meant working for extra hours and during holidays in order to meet the research target. Commercial motorcycle riders had very little time to concentrate on filling of the questionnaire because they were always on the move. Some respondents were unwilling to reveal information since they thought that it was confidential. Other respondents felt that the exercise had no direct financial gain in the filling of the questionnaire.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.0 Introduction**

This chapter presents the summarized results of the study with reference to the study objectives in a chronological order. Findings of each question or objective are thoroughly discussed and presented in form of graphs, charts, tables and comparison of variables for the purpose of approval or disapproval of the two hypotheses was done.

#### **4.1 Socio-economic characteristics of the respondents**

Statistical analyses presented in this study were based on quantitative data gathered in the field travel surveys undertaken in Laikipia East sub-county in 2015. For clarity, uniformity and adequacy in representing the research objectives, questions were defined into various variables. The variables were assigned numerical values in order for them to be analysed. A total of 41 variables were generated representing the questions in order to address the researcher's thirst of answers to the research questions. Data validation procedure was applied in performing data checks solely based on each variable's measure level. This was done with the help of SPSS version 20 programme.

##### **4.1.1: Respondents' age categories in years**

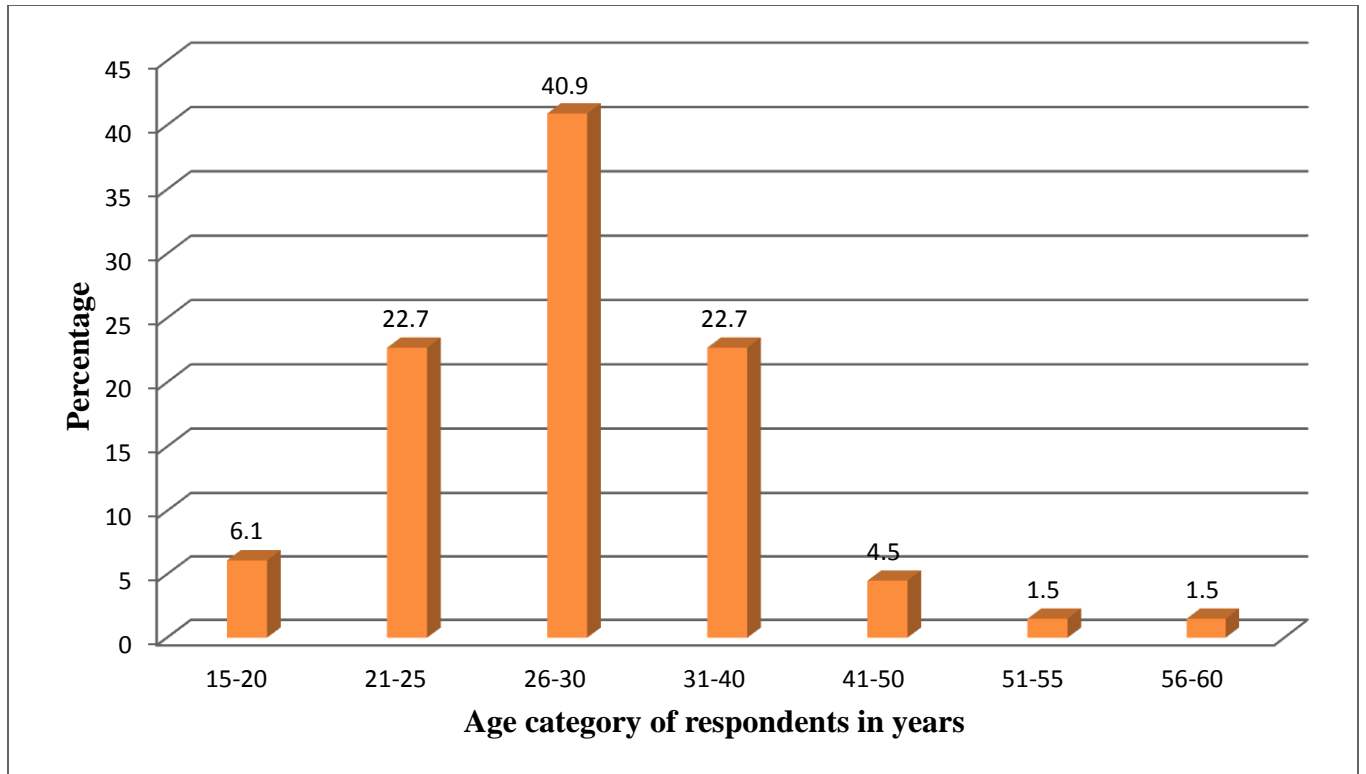
The spread of respondents' age categories as shown in Table 4.1 indicates the total number of commercial motorcyclists interviewed within the sub-county. The age category of 26-30 years had the highest number of commercial motorcycle riders with a total of 27 whose percentage was 40.9 of the total riders interviewed. The total number of commercial motorcycle riders within the Sub-County was established to be about 153. All the respondents in the study were males.

**Table 4.1: Distribution of respondents' age category in the study area**

Age category of respondents in years	Frequency	Percent
15-20	4	6.1
21-25	15	22.7
26-30	27	40.9
31-40	15	22.7
41-50	3	4.5
51-55	1	1.5
56-60	1	1.5
Total	66	100.0

**Source:** Field Data (2015)

The age of respondents was classified into seven categories and their frequencies were shown in form of a bar graph. It was established from the study that majority of commercial motorcycle riders were in the age bracket of 26-30 years which gave rise to 40.9 percent. The second age bracket of the commercial motorcycle riders was 21-25 years which shared a similar percentage with 31-40 years (22.7 percent). The age bracket of 15-20 years had a 6.1 per cent while 41-50 years category had a 4.5 percent. The last two categories were 51-55 years and 56-60 years which had a similar percentage of 1.5 percent each.



**Source:** Field Data (2015)

**Figure 4.1:** Age of respondents in years

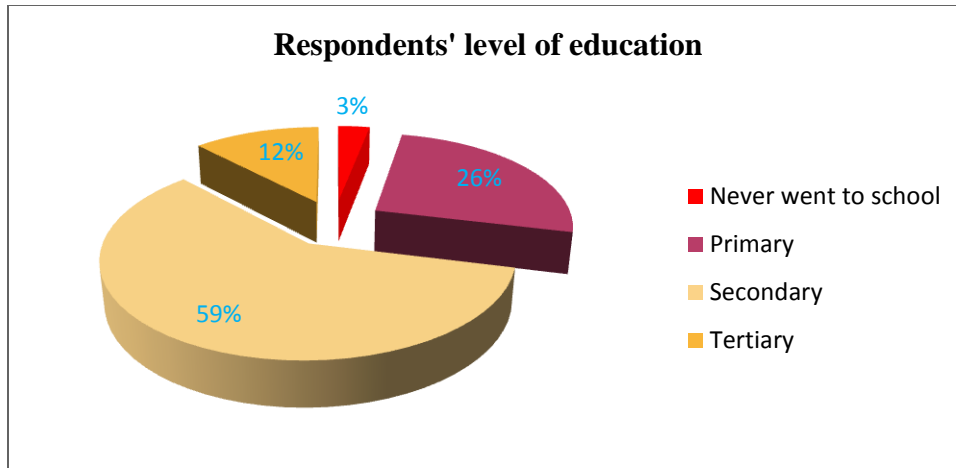
#### **4.1.2: Gender of the Respondents**

The researcher sought to know the sex of the respondents. The study revealed that the operators of *boda boda* business in Laikipia East Sub-County are 100 percent dominated by male. The nature of the business is a high risk business and women are low risk takers.

#### **4.1.3: Respondents Level of education**

As far as educational level is concerned, it was established that 59 percent of the respondents had attained secondary school level of education while 26 per cent had attained primary school level of education. 12 per cent of the respondents had attained tertiary education and 3 percent of the respondent never went to school. This underlines the importance of commercial motorcycle in provision of employment to various categories of people.





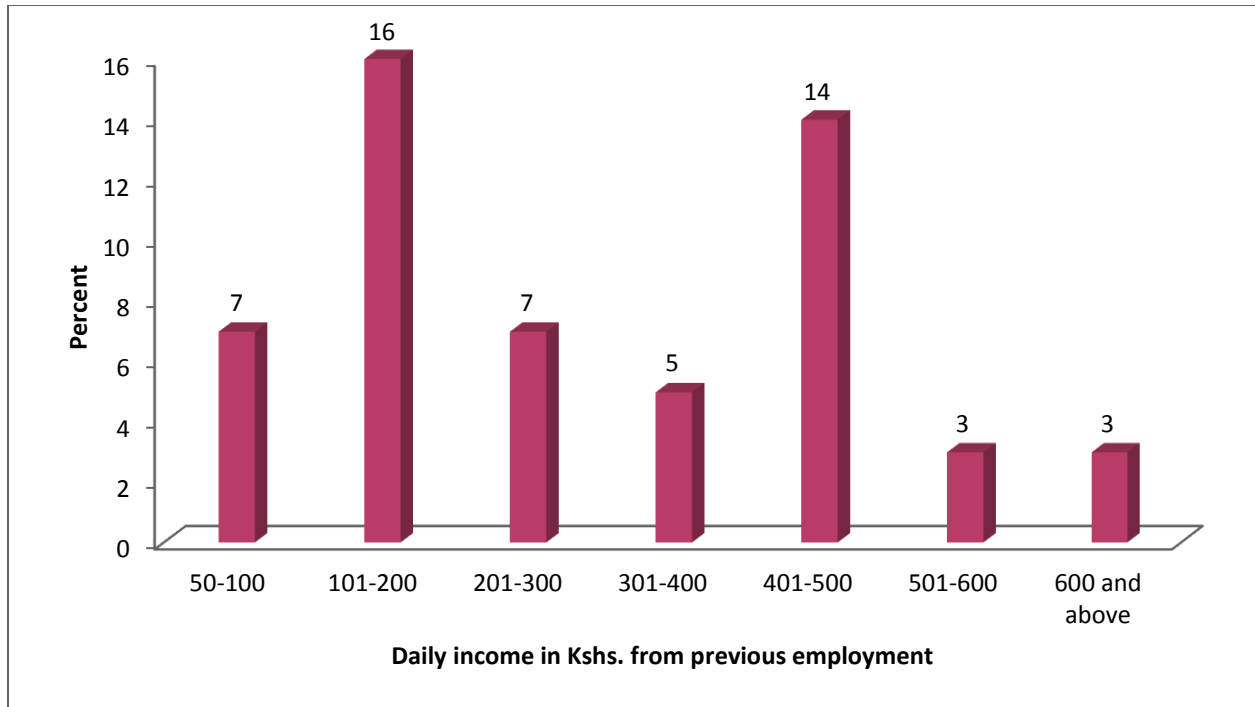
Source: Field Data (2015)

**Figure 4.2:** Distribution of the respondents based on their level of education

**4.1.4: Respondents' previous employment and current daily income level in Kenya shillings**

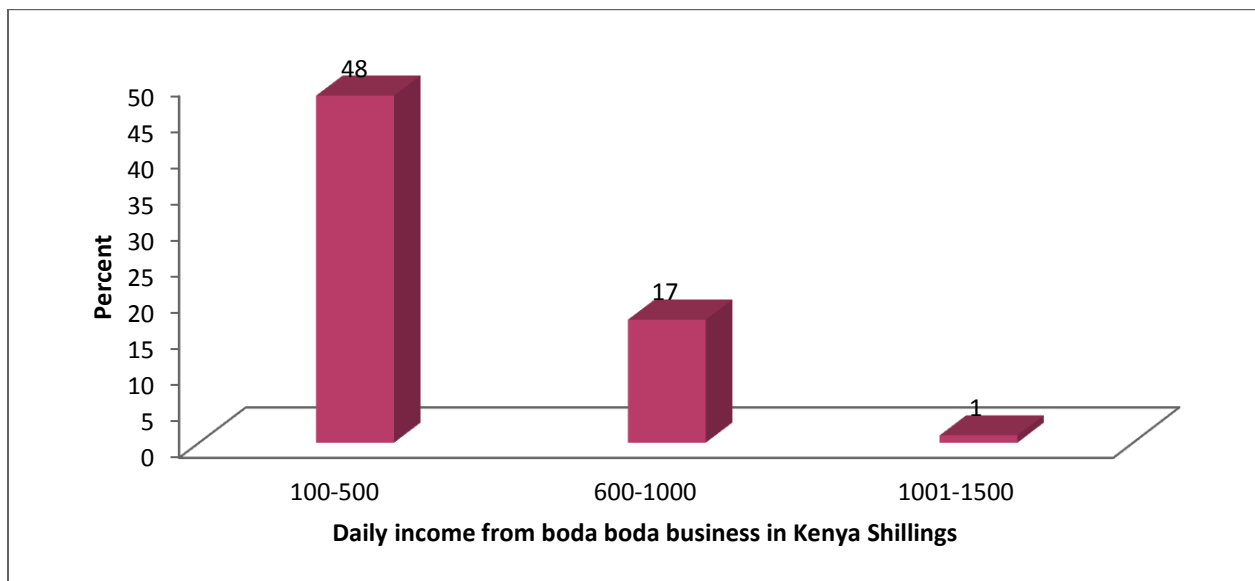
Research found out that 49 percent of the respondents were earning between Kshs.50-500 while 6 per cent were earning above Kshs. 500 from previous employment as indicated in Figure 4.3. Majority of respondents were earning Kshs. 101 – 200.

It was found out from the research that 48 percent were earning between Kshs. 100 – 500 as their daily income from *boda boda* business in Kenya Shillings, while 18 percent earned Kshs. 600-1500. This proved that *boda boda* earnings for the respondents had a higher margin of their earnings than their previous occupation margin (Figure 4.4).



Source: Field Data (2015)

Figure 4.3: Previous Employment daily income level in Kenya Shillings

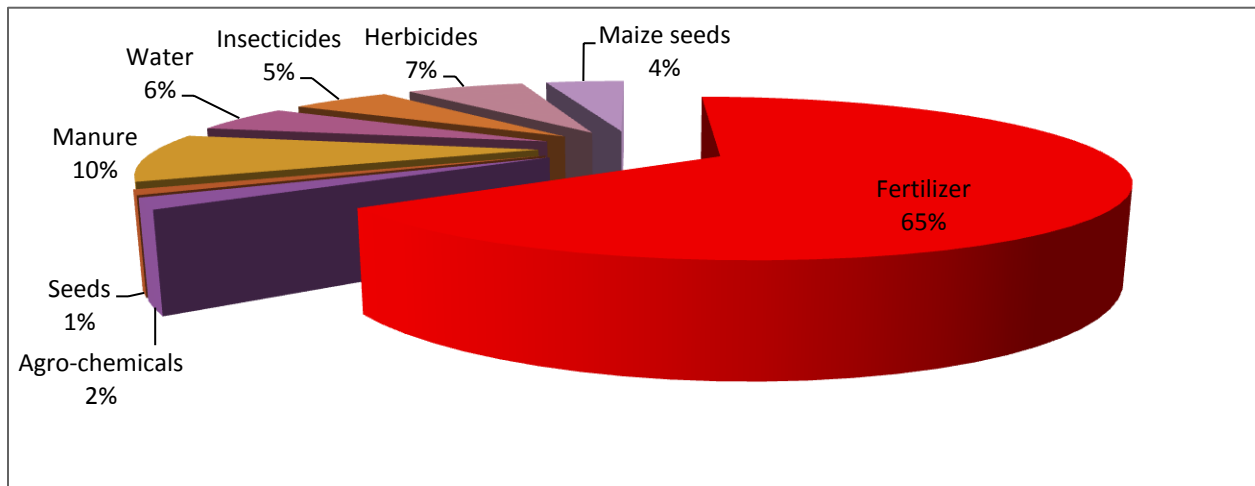


Source: Field Data (2015)

Figure 4.4: Respondents' boda boda's business daily income level in Kenya Shillings

#### 4.2 The role of commercial motorcycles in promoting agriculture

Accessibility can be measured by number of travel opportunities or destinations within a particular travel radius, measured in terms of either travel time or distance. A wide variety of agricultural products are taken from the farm fields to the market centers for sale. Although subsistence agricultural production in Laikipia East District has been affected by several factors such as escalating costs of farm inputs, poor market prices and reduced arable lands due to land fragmentations caused by population increase, changes in rainfall patterns is the major contributing factors. Promotion of agriculture by commercial motorcycles in the rural areas can be discussed in two ways: transportation of agricultural inputs and outputs. Research findings indicate that agricultural inputs transported by commercial motorcycles include: fertilizer had 65 percent and had the highest share, while manure accounted for 10 percent, herbicides had 7 percent, maize seeds had 4 percent, while agro-chemicals accounted for 2 percent. The study also found out that agricultural products transported by commercial motorcycles include: cabbage which accounted for 48 percent of agricultural products transported per month in Laikipia East Sub-county. Maize accounted for 33 percent. Maize is grown as a staple crop and is the second highest agricultural product transported by commercial motorcycles per month. Potatoes account for 26 percent. This is perhaps attributed to the cultural feeding habits of the people of Laikipia East and the agricultural practices of the area.



Source: Field Data (2015)

Figure 4.5: Percentage of agricultural inputs transported by commercial motorcycles

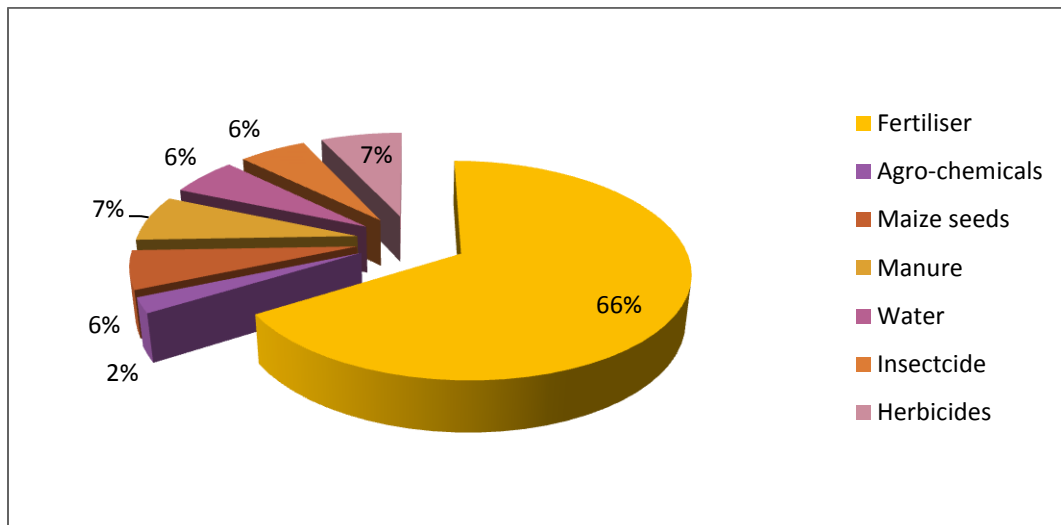
**Table 4.2: Agricultural products transported by commercial motorcycles in Laikipia East Sub-county**

Agricultural products transported	Responses	
	n	Percent
Onions	20	7.8
Cabbages	47	18.2
Tomatoes	24	9.3
Carrots	21	8.1
Maize	45	17.4
French beans	1	0.4
Wheat	6	2.3
Oranges	2	0.8
Bananas	8	3.1
French peas	1	0.4
Beans	22	8.5
Potatoes	36	14.0
Green peas	1	0.4
Sukumawiki	7	2.7
Fruits	5	1.9
Sugarcane	1	0.4
Milk	3	1.2
Spinach	2	0.8
Eggs	3	1.2
Carrying piglets	1	0.4
Pineapples	2	0.8
Total	258	100.0

**Source:** Fieldwork Data (2015)

Land development generates travel, and travel generates the need for new facilities, which in turn increases accessibility and attracts further development. Agricultural practices within Laikipia East calls for application of fertilisers, agro-chemicals, maize seeds, manure, insecticide and herbicides. These agricultural inputs are usually bought and transported from the market centers. Commercial motorcycles find use in the transport of the agricultural inputs from the market centers to the farm fields this increases accessibility and agricultural development hence alleviation of poverty.

Agricultural inputs transported by commercial motorcycles were 66 percent per month in Laikipia East Sub-county per month is fertilizer. This is mainly because the fertilizers are not available within the fields but manure is available within the fields' proximity. Other intermediate modes of transport like animal driven carts are used due to the bulky nature of manure. Fertilisers are sensitive to bad weather conditions and therefore they require to be transported to the fields fast. This may not be accomplished by animal driven carts since the distance from the farm fields to the market centres is too far. The other agricultural inputs such as agrochemicals, maize seeds, insecticides and herbicides are required in low quantities compared to fertilizers.



**Source:** Fieldwork Data (2015)

**Figure 4.6** Volume of agricultural inputs transported by commercial motorcycles per month in Laikipia East Sub-county per month

Availability of means of production for instance, tools, machinery, seed, fertiliser is improved; at the same time this expands the opportunities for processing primary products. Farmers no longer need to obtain supplies via complicated routes. Professional advice services, including private ones, can more readily be provided in rural areas. The need of urban population groups for nearby recreational facilities opens up new development potentials and alternative income-generating opportunities, especially in scenically attractive areas. Transport costs are reduced; as a result, goods become cheaper for producers, traders and end consumers. Journeys become both shorter and faster. The risks arising from transport difficulties or failures are reduced.

### 4.3 The role of commercial motorcycles in poverty alleviation

As illustrated from Table 4.2, contribution towards poverty alleviation can be achieved through the various activities that have come up as result of commercial motorcycle ridership. The key activities include; construction of roadside kiosks, sale of commercial motorcycle spare parts, intensive cattle rearing, poultry keeping and repair of motorcycles. These activities generate gainful employment and hence alleviating poverty in Laikipia East Sub-county. This addresses the second objective of the study whose role is to investigate the contribution of commercial motorcycles in increasing poverty alleviation.

**Table 4.2: Non-Agricultural Activities that have come up as a result of commercial motorcycle ridership**

Activities	Responses	
	n	Percent
Construction of kiosks	3	5.1
Sales of motorcycle spares	16	27.1
Motorcycle mechanics	8	13.6
Petrol roadside sales	11	18.6
Roadside kiosks	7	11.9
Motorcycle garages	8	13.6
Formation of self help groups	7	10.1
<b>Total</b>	<b>60</b>	<b>100</b>

**Source:** Field Data (2015)

Plate 2 illustrates some of the activities that have come up as a result of commercial motorcycle ridership. Carrying of passengers from one place to another is a core activity as observed from

the field. Commercial motorcycles are also used for ambulance services in Laikipia East Sub-county as they transport patients in and out of the hospital.



**Source:** Field Data (2015)

**Plate 1:** An adult and two children being carried by a *boda boda*

Plate 3 illustrates some of the activities that have come up as a result of commercial motorcycle ridership. Transporting of agricultural products from farms to market centres is a core activity in the area.



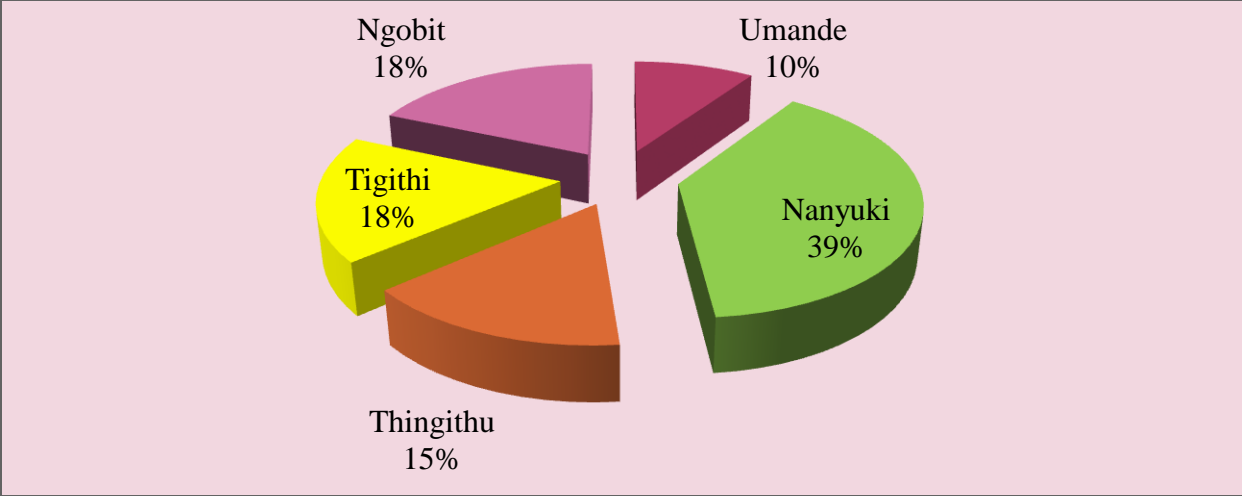
**Source:** Field Data (2015)

**Plate 2:** *Boda boda* transporting a bag of potatoes from farm to the market

#### **4.4 Spatial distribution of commercial motorcycles parking points**

This study had its third objective as: (iii) To investigate the spatial distribution patterns of commercial motorcycles in Laikipia East Sub-County. The research findings indicate uneven distribution of the parking points. The highest concentration was in Nanyuki Town which accounted for 39 percent, Tigithi and Ngobit locations shared a 18 percent, Thingithu location had a 15 percent, while Umande location had 10 percent which was the lowest of the total number of motorcyclists.





Source: Field Data (2015)

Figure 4.7: Spatial distribution of commercial motorcycles in Laikipia East Sub-County



Source: Field Data (2015)

Plate 3: Boda boda riders’ meeting with the researcher at Matanya/Tigithi stage parking in preparation for their interview during Palm Sunday, April 2015

GPS co-ordinates were taken from the parking points. The coordinates enabled the researcher to generate a map of the study area. The following were the coordinates of the parking points. The coordinates of Umande Location was 0294160, 0010816; Nanyuki Location was sub-divided into four parking points: Mukima 0286014, 0002067; KANU ground 0285961, 0002065; Stage 0285961, 0002065. Thingithu 0284271, 003444; Tigithi 0285517, 0001221; and Ngobit 0254995, 9993137.

**Table 4.3: GPS for commercial motorcycle parking points**

Location	Eastings (X) coordinates	Northings (Y) coordinates
<b>Umande</b>	0294160	0010816
<b>Nanyuki:</b>		
• Mukima	0286014	0002067
• KANU ground	0285961	0002065
• Stage	0285898	0002096
• Standard	0279912	0001729
<b>Thingithu</b>	0284271	0003444
<b>Tigithi/Matanya</b>	0285517	0001221
<b>Ngobit</b>	0254995	9993197
Naromoru	0276454	9547463

**Source:** Field Data, 2015

#### **4.5 Previous occupation for commercial motorcyclists in Laikipia East Sub-county**

Field interviews showed that operators of *boda boda* are drawn mainly from workers, business community, school leavers, and security personnel. The riders who had previous occupation as farmers had the highest frequency of 22 with a percentage of 33.3. Those who joined the *boda boda* business immediately after school had the second highest frequency of 12 with a percentage of 18.2 per cent.

Table 4.4 indicates that 33.3 percent of commercial motorcycle owners/riders were originally farmers while 18.2 percent of the riders had joined the profession after leaving school. 7.6 percent of the motorcyclists started as manual labourers before joining the profession; those who were previously jobless, mechanics, mason and hawkers had 3.0 percent each.

**Table 4.4: Previous occupation for commercial motorcyclists in Laikipia East Sub-county**

<b>Former Occupation</b>	<b>Frequency</b>	<b>Percent</b>
Farmer	22	33.3
Shepherd	1	1.5
Distributor of retail goods	1	1.5
Matatu conductor	1	1.5
Mechanic	2	3.0
motor cycle rider employee	1	1.5
Mason	2	3.0
Bread distributor	1	1.5
Manual labourer	5	7.6
G4S	1	1.5
Matatu driver	1	1.5
Businessman	1	1.5
Sales person	2	3.0
plumber	1	1.5
From school to <i>boda boda</i> (Job seekers)	12	18.2
Farm supervisor	1	1.5
Hawker	2	3.0
Baker	1	1.5
Personal driver	1	1.5
Charcoal dealer	1	1.5
Jobless	2	3.0
Shop Assistant	1	1.5
Car wash	1	1.5
Photographer	1	1.5
Shamba Boy	1	1.5
Total	66	100.0

**Source:** Field Data (2015)

**Table 4.5: New Registration of Road Motor Vehicle in Kenya, 2010 - 2013**

Type of vehicle	2010	2011	2012	2013
Saloon cars	16 165	11 026	12 985	16 343
Station Wagons	37 553	31 199	39 862	48 662
Panel Vans, Pick-ups.	6 975	7 442	7 945	9 819
Lorries/Trucks	4 924	5 247	7 821	9 570
Buses and Coaches	1 264	1 662	1 638	2 062
Mini Buses/Matatus	3 600	451	78	235
Trailers	2 379	2 556	3 761	3 973
Wheeled Tractors	1 161	1 179	1 386	1 902
Motor and Autocycles	117 266	140 215	93 970	125 058
Three Wheelers	1 521	2 140	1 845	3 103
Other vehicles	3 648	2 724	1 753	1 451
<b>Total Units Registered</b>	<b>196 456</b>	<b>205 841</b>	<b>173 044</b>	<b>222 178</b>

Source: Kenya Revenue Authority (2013)

#### 4.5.1: Hypothesis 1 Testing

**Table 4.6: Calculation of the Chi-square ( $\chi^2$ ) for hypothesis (i)**

Location	Number of motorcyclists interviewed	Agricultural Activities	Expected	$\chi^2 = \sum \frac{(O - e)^2}{e}$
<b>Umande</b>	5	10	8.69	0.20
<b>Nanyuki: Mukima</b>	7	8	8.69	0.20
<b>Nanyuki: KANU ground</b>	9	17	15.07	0.12
<b>Nanyuki: Stage</b>	13	10	11.59	5.00
<b>Nanyuki: Standard</b>	10	15	13.91	3.38
<b>Tigithi/Matanya</b>	9	15	16.23	6.04
<b>Ngobit</b>	13	16	16.81	5.83
<b>Total</b>	66	91		20.77

Source: Field Data (2015)

From Table 4.5 deductions were made from the tested hypothesis thus:

H<sub>0</sub> There is no significant difference between promotion of agriculture and commercial motorcycles' frequency in Laikipia East Sub-County.

Calculated ( $\chi^2$ ) = **20.77**

At 0.05 significance level and at 4 degrees of freedom, Critical ( $\chi^2$ ) = **9.49**

Since the calculated value of ( $\chi^2$ ) is greater than the critical ( $\chi^2$ ), the null hypothesis is rejected and therefore a conclusion is made that promotion of agriculture is dependent on commercial motorcycles frequency in Laikipia East Sub-County.

**4.5.2: Hypothesis 2 Testing**

The second objective was to examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County, while the second hypothesis stated that:

H<sub>0</sub> There is no significant difference between previous employment and commercial motorcycles contribution in poverty alleviation in Laikipia East Sub-County.

**Spearman's Rank Correlation Coefficient**

			Income per day from the occupation business in Kenya shillings.	Income per day from boda boda business in Kenya shillings
Spearman's rho	Income per day from the occupation business in Kenya shillings.	Correlation Coefficient	1.000	.318
		Sig. (2-tailed)	.	.009
	Income per day from boda boda business in Kenya shillings	Correlation Coefficient	.318	1.000
		Sig. (2-tailed)	.009	.

a. Listwise N = 66

Results show that there was a medium positive relationship of 0.318 between previous employment income and the current commercial motorcycle income.  $r^2$  was therefore 0.318<sup>2</sup>.

The study found out that commercial motorcycle contributes 10 percent in poverty alleviation in Laikipia East Sub-County.

Since the value of Spearman’s Rank Correlation Coefficient is greater than 5%, the null hypothesis is rejected and therefore a conclusion is made that there is a significant difference between previous employment and commercial motorcycles contribution in poverty alleviation in Laikipia East Sub-County.

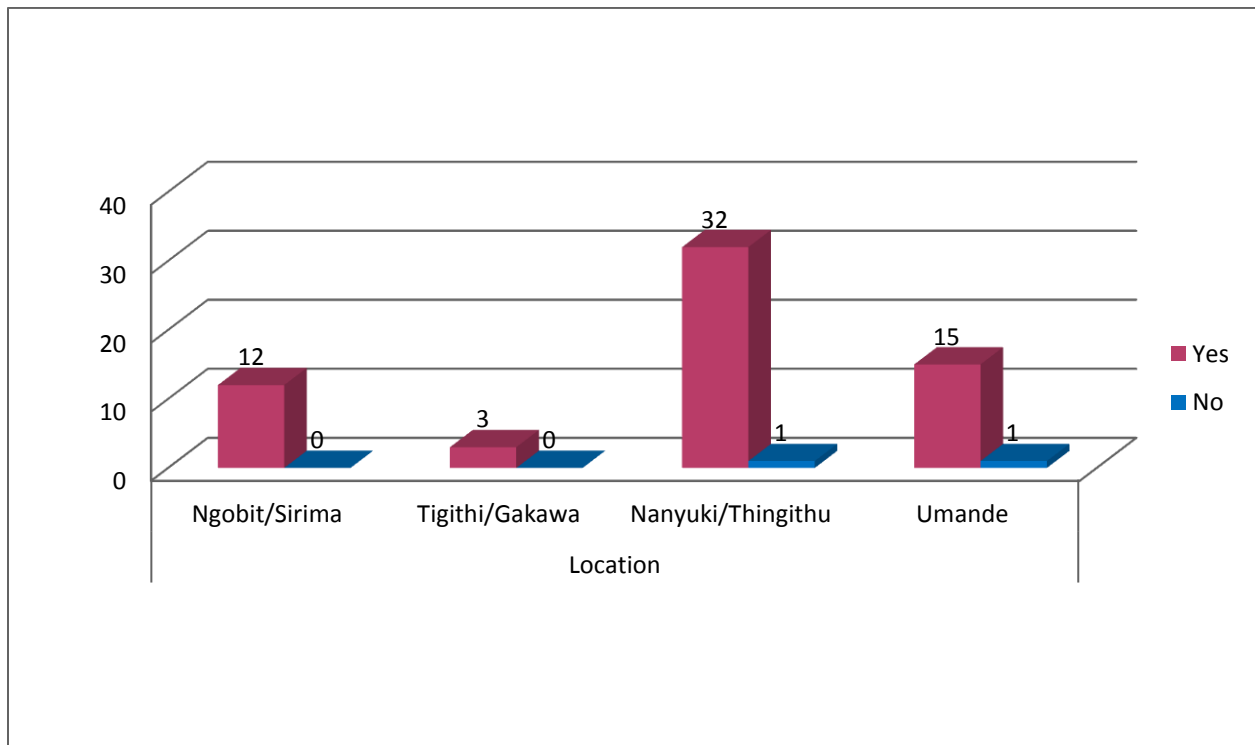
**Table 4.7: Location of parking points and the total number of motorcycles in Laikipia East Sub-County**

Location	Available number of motorbikes	Total
Umande	5	10
Nanyuki:		
• Mukima	7	20
• KANU ground	9	30
• Standard	10	20
Thingithu	9	20
Tigithi/Matanya	13	33
Ngobit	13	20
<b>Total</b>	<b>66</b>	<b>153</b>

**Source:** Field Data (2015)

Rural development is not limited to agricultural production, it is also concerned with value added based on agricultural production and the provision of basic social and economic services. At local village level health and education facilities, supplies of means of production, alternative economic sectors and income-earning opportunities are often non-existent or very basic, making them very difficult to access. Cash crops and locally produced food can more easily be taken to hubs and markets and transported onwards from there. Price fluctuations can be exploited more quickly and more promptly. It is easier for purchasers to access producers. It becomes easier to

establish social services, such as health and education, and access to these services is therefore improved. Economic opportunities such as jobs and markets in urban areas benefit the rural population. Education opportunities are increased through improved access to institutions other than those located only at local level.



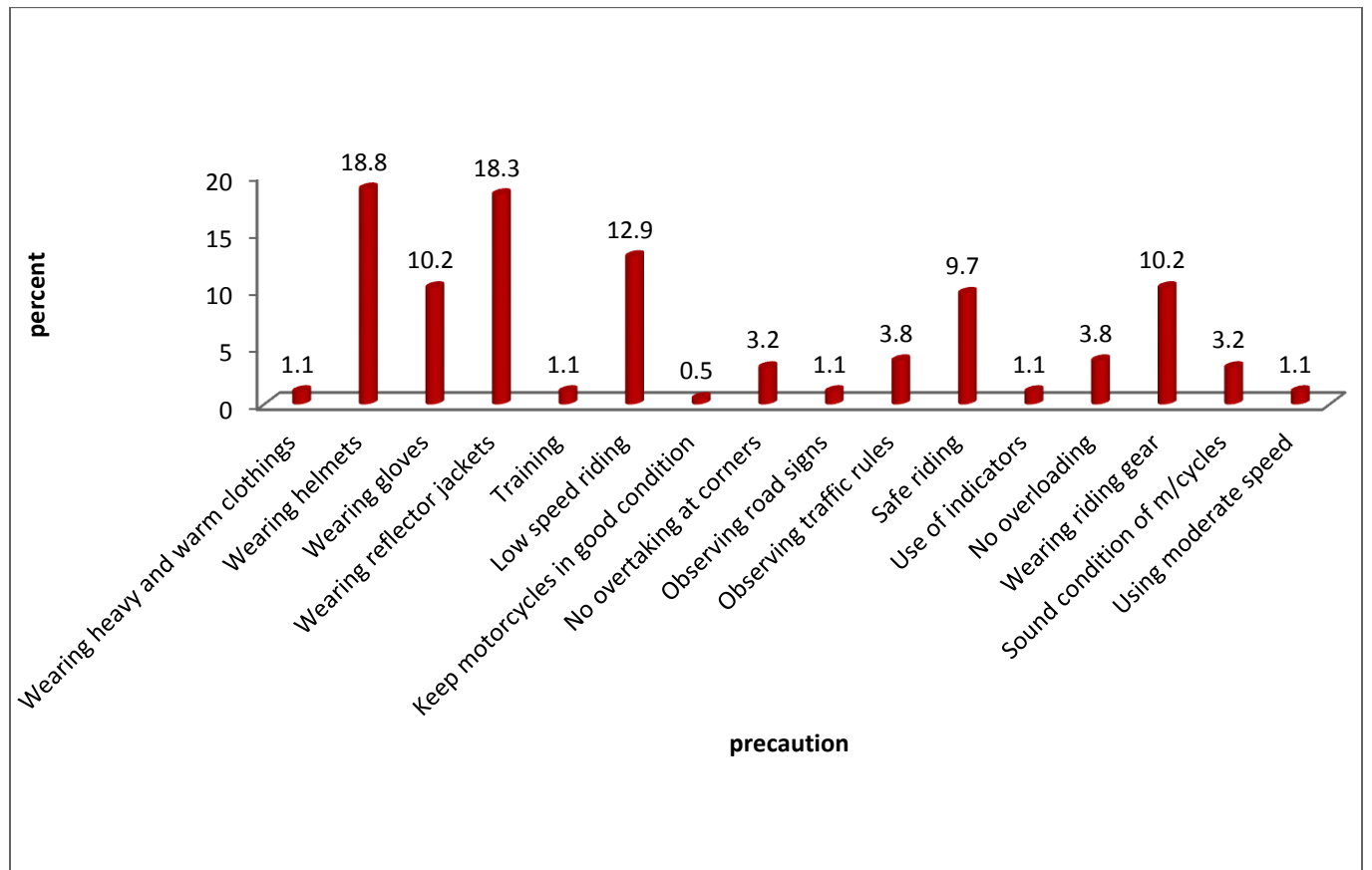
**Source:** Field Data (2015)

**Figure 4.8: Number of commercial motorcycles which were insured and those that were not insured**

#### **4.5.3: Ethical considerations**

All the interviewees were assured of their responses' confidentiality. Details of the respondents were not expected to be disclosed anywhere in the questionnaire. The motorcyclists were spread out as they filled the questionnaire to avoid duplication of the answers. The researcher helped the respondents to understand and interpret the questions to avoid ambiguous answers. High integrity was maintained during the time of the questionnaire administration in order to ensure

that there was no lead questions scenario. Each commercial motorcyclist was given only one questionnaire to fill. Wearing safety gear had a frequency of 35 and was the highest cited precaution by most of the responds. Wearing reflector jacket was the second cited precaution with a count of 34. Amongst the precautions cited low speed riding had a count of 24 while safe riding had frequency 18.



Source: Field Data (2015)

Figure 4.9: Precautions taken against accidents when riders are cycling.

#### 4.5.4 Commercial Motorcycle Challenges

The growth of motorcycles in Laikipia East Sub-county has itself encountered a myriad of challenges including those encountered by motorcyclists themselves, those encountered through motorcycle traffic control, those encountered by the local planning authorities and other safety and security concerns of motorcycle transport. The challenges included the following:



Motorcyclists are faced continually with increases in the prices and shortages of fuel coupled with high cost of motorcycle spare parts. Ironically, respondents from the field survey saw the persistent operation on helmet use as harassment and unnecessary especially within Nanyuki Town. There is an increase in theft cases of motorcycles. Motorcyclists in Laikipia East Sub-county also have the challenge of competing with animals like sheep and goats loitering everywhere even on the narrow road surface for motor vehicles.

#### **4.5.4.1 Commercial Motorcycle Accidents**

Road traffic injuries and deaths are a growing public health concern worldwide. Road crashes are the second leading cause of death globally among young people (WHO, 2004). The annual costs of road traffic crashes in low income and middle-income countries are estimated to be between US\$65–100 billion, more than the total annual amount received in development aid (UN, 2008). The estimated costs as a percentage of the Gross National Product (GNP) in most African countries range from about 0.8% in Ethiopia and 1% in South Africa to 2.3% in Zambia and 2.7% in Botswana to almost 5% in Kenya (Odero *et al*, 2003).

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter provides a summary of the findings, discussion, conclusion and recommendations of the study which sought to determine the role of commercial motorcycles in the rural economy: a case study of Laikipia East Sub-County, Kenya.

#### 5.2 Summary of Research Findings

The overall objective of this study was to determine the role of commercial motorcycles in the rural economy in Laikipia East Sub-county. The study sought to determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County. The study found out that amongst the agricultural inputs transported by commercial motorcycles in Laikipia East 66 percent was fertilizer. This was mainly because the fertilizers are not available within the fields but manure is available within the fields' proximity. Other intermediate modes of transport like animal driven carts are used due to the bulky nature of manure. Fertilizers are sensitive to bad weather conditions and therefore they require to be transported to the fields fast. This may not be accomplished by animal driven carts since the distance from the farm fields to the market centers was too far. The other agricultural inputs were agrochemicals, maize seeds, insecticides and herbicides are required in low quantities compared to fertilizers.

Research findings indicate that monthly agricultural inputs transported by commercial motorcycles also included manure which accounted for 10 percent, herbicides 7 percent, maize seeds 4 percent, while agro-chemicals accounted for 2 percent. The study also found out that agricultural products transported by commercial motorcycles include: cabbages which accounted for 48 percent of agricultural products transported per month in Laikipia East Sub- County. Maize accounted for 33 percent. Maize is grown as a staple crop and is the second highest agricultural product transported by commercial motorcycles per month. Potatoes account for 26 percent. This is perhaps attributed to the cultural feeding habits of the people of Laikipia East and the agricultural practices of the area.

The second objective was to examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County, while the second hypothesis stated that:

Ho        There is no significant difference between previous employment and commercial motorcycles contribution in poverty alleviation in Laikipia East Sub-County.

The contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County is manifested in several activities that have come up as a result of commercial motorcycle operations such as: construction of kiosks, sale of motorcycle spare parts, motorcycle mechanics, petrol roadside sales though illegal but provides a new occupation, motorcycle garages, poultry keeping and formation of self-help groups which finances members with soft loans.

The Spearman's Rank correlation coefficient between commercial motorcycle transportation and agricultural production indicated a medium positive relationship of 0.318 between the two variables. This shows that commercial motorcycle contributes about 10 percent in promotion of agriculture which supports the first objective which sought to determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County. This can be summed as employment creation which has come as result of motorcycle ridership. Daily income in the previous employment showed a declining profit margin compared to the new occupation of commercial motorcycle operators business.

The research revealed that, in order for commercial motorcycle business to maximize their profits there is an urgent need to reduce insurance fee, licence fee, cost of spare parts and immediate response to theft cases. The respondents also felt that the government should reduce petrol prices, motorcycle spare parts, and emphasize on road improvement as a measure of developing the commercial motorcycle industry.

### 5.3 Conclusions

To achieve the goals of the study three objectives were formulated:

- (i) To determine the contribution of commercial motorcycles in promoting agriculture in Laikipia East Sub-County.
- (ii) To examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County.
- (iii) To investigate the spatial distribution patterns of commercial motorcycles in Laikipia East Sub-County.

The study had two hypotheses:

- (i) There is no significant difference between promotion of agriculture and commercial motorcycles' frequency in Laikipia East Sub-County.

Calculated ( $\chi^2$ ) = **20.77**

At 0.05 significance level and at 4 degrees of freedom, Critical ( $\chi^2$ ) = **9.49**. Since the calculated value of ( $\chi^2$ ) is greater than the critical ( $\chi^2$ ), the null hypothesis was rejected and therefore a conclusion was made that promotion of agriculture is dependent on commercial motorcycles frequency in Laikipia East Sub-County.

The second objective was (ii) to examine the contribution of commercial motorcycles in poverty alleviation in Laikipia East Sub-County. The second research hypothesis stated that:

(ii) There was no significant difference in contribution of commercial motorcycles (current employment) and previous occupations to poverty alleviation in Laikipia East Sub-County. The hypothesis was tested using Spearman's Rank Correlation Coefficients and showed that there was a weak positive relationship of 0.318 between previous employment income and the current commercial motorcycle income.  $r^2$  was therefore  $0.318^2$ . The study found out that commercial motorcycle contributes about 10 percent towards poverty alleviation in Laikipia East Sub-County.

The research also found out that, a complete sample frame for commercial motorcycle riders does not exist. The research evaluated the earnings among commercial motorcycle operators and the previous businesses in Laikipia East Sub-County. Commercial Motorcycle business is a source of livelihood as it provides income for the unskilled, semi-skilled and the socially marginalized hence improving the rural economy. The research also revealed that wearing a helmet was the single most effective way of reducing head injuries and fatalities resulting from motorcycle crashes. Although Kenya has a comprehensive helmet law that requires mandatory helmet wearing on all types of motorcycles on all roads, the law enforcement mechanisms are weak and compromised.

## **5.4 Recommendations**

### **5.4.1 Recommendations for policy makers**

Intensified effort should be made by government to rehabilitate bad roads and construct commercial motorcycle lanes in Laikipia East Sub-County. Training and retraining of motorcycle operators must be emphasized and proper enforcement measures should be undertaken at all times. In addition, an accurate data base should also be maintained and frequently updated to help facilitate effective road monitoring of commercial motorcycle activities for sustainable rural transport planning. This will help in record keeping and trace any accident victims or crime committed by the operators. To ascertain the level of experience in riding, motorcyclists should be made to undertake tests and licences issued before they can be permitted to operate on roads. Regulation on compulsory use of safety materials, such as protective head helmets, goggles, hand gloves should be enforced and users of commercial motorcycle should be sensitized and educated on the benefit of the usage of protective head helmets. Government should formalize and regulate the activities of commercial motorcycle operators to strengthen the business.

Transport facilities under public ownership and management generally have weak and ineffective structures. Lack of capacity and shortage of resources seriously undermines their capability for good corporate governance, sound decision making and efficient management. There is a need for increased private sector participation in the transport sector to ensure efficiency in the allocation of resources and to maximize efficiency in the delivery of services

particularly to informal sectors. There is a need to strengthen legal enforcement of helmet wearing and ensuring the availability and accessibility of quality helmet to the majority of commercial motorcyclists. There is also need for regular education campaigns to foster positive attitude towards helmet use.

#### **5.4.2 Recommendations for commercial motorcycle operators**

Two behaviours were identified as being particularly essential to operators safety. The first behaviour was the necessity of being able to handle the motorcycle proficiently and skillfully. The second behaviour was related to the need for operators to maintain a high level of concentration when riding and to be aware of the changing road environment.

#### **5.4.3 Recommendations for further research**

There has been little research conducted on rural transport business operations, such as the role of transport operator associations in route designation, fare setting, timetabling, training, road safety and driver/passenger interactions with police and other relevant actors. This is an important gap which needs to be filled.

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## APPENDICES

### APPENDIX I: INTRODUCTION LETTER TO RESPONDENTS

I am a postgraduate student in the Faculty of Arts, University of Nairobi, pursuing a Master of Arts in Transport Geography course in the Department of Geography and Environmental Studies. My research topic is entitled, “*The role of Commercial Motorcycles in the rural economy: A case study of Laikipia East Sub-county, Kenya*”.

This research is for academic purpose and responses to the questions will enable the researcher to comprehensively compile the research findings. Kindly provide answers to the questions as honestly as possible. Do not write your name anywhere. Tick in the box that reflects your choice or fill in the required information in the space provided.

Your cooperation in answering this questionnaire will be highly appreciated.

Thank you.

## APPENDIX II: QUESTIONNAIRE

### Instructions to respondents

- Kindly tick against your answer and give a brief explanation where necessary.
- Please answer all questions.

---

### SECTION A: Demographic profile of respondents

1. Age of respondent in years:            15-20     21-25     26-30

31-40     41-50     50-55

56-60     61 and above

2. Gender (sex of respondent):            Male             Female

3. *Boda boda* rider respondent's Level of Education

Never went to school                        Primary           

Secondary                        Tertiary           

**Key informant's location:**

Location .....

Sub-location .....

### SECTION B: Contribution of commercial motorcycles

1. What was your first occupation before joining the current occupation?

2. Income per day from the occupation business in Kenya shillings.

50 – 100                        101 – 200                        401 – 500                        600 and above           

201-300                        301 – 400                        501 – 600

3. How far is the distance from the origin to the tarmac road?.....

4. How many trips do you make per day?

5. Ownership of the motorcycle:

Employer  Self

6. Income per day from *Boda boda* business in Kenya shillings.

100 – 500  600 – 1000  1001- 1500

1501- 2000  2100- 2500  2500 and over

7. Which agricultural products do you transport?

(i) \_\_\_\_\_

(ii) \_\_\_\_\_

(iii) \_\_\_\_\_

(iv) \_\_\_\_\_

(v) \_\_\_\_\_

8. Which is the origin and destination of the agricultural products transported?

(i) \_\_\_\_\_

(ii) \_\_\_\_\_

(iii) \_\_\_\_\_

(iv) \_\_\_\_\_

9. (a) State the volumes in kilograms of the agricultural produce transported per day.

\_\_\_\_\_

(b) State the volumes in kilograms of the agricultural produce transported per week.

\_\_\_\_\_

(c) State the volumes in kilograms of the agricultural produce transported per month.

\_\_\_\_\_

10. How often do you transport the agricultural produce?

\_\_\_\_\_

11. Which agricultural inputs do you transport?

\_\_\_\_\_

12. Which is the origin and destination of the agricultural inputs transported?  
\_\_\_\_\_

13. (a) State the volumes in kilograms of the agricultural inputs transported per day.  
\_\_\_\_\_

(b) State the volumes in kilograms of the agricultural inputs transported per week.  
\_\_\_\_\_

(c) State the volumes in kilograms of the agricultural inputs transported per month.  
\_\_\_\_\_

14. How often do you transport the agricultural inputs?

**SECTION C: Contribution towards poverty alleviation**

1. Are you aware of any existing regulatory policy guidelines? Yes  No

2. Do you insure your motorbike against any risk? Yes  No

3. Are there any activities that have come up as a result of commercial motorcycle ridership?  
Yes  No

4. If Yes, state the activities.  
\_\_\_\_\_  
\_\_\_\_\_

5. Do you have any centralized coordination? Yes  No

6. (a) Do you have any welfare organization? Yes  No

(b) If Yes, Indicate the name \_\_\_\_\_

7. Are you aware of any licensing institution? Yes  No

8. Do you have a license for commercial motorcycle ridership? Yes  No

9. Are there any precautions that you take against accidents when cycling? Yes  No

10. If Yes, state the precautions:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. Are there conditions to be met before access to the Profession of motorbike taxi business? Yes  No

12. If Yes, state the conditions:  
\_\_\_\_\_  
\_\_\_\_\_

13. Suggest ways on how commercial motorcycle business may be improved?  
\_\_\_\_\_  
\_\_\_\_\_

14. How did you obtain money to acquire a commercial motorcycle?  
\_\_\_\_\_  
\_\_\_\_\_

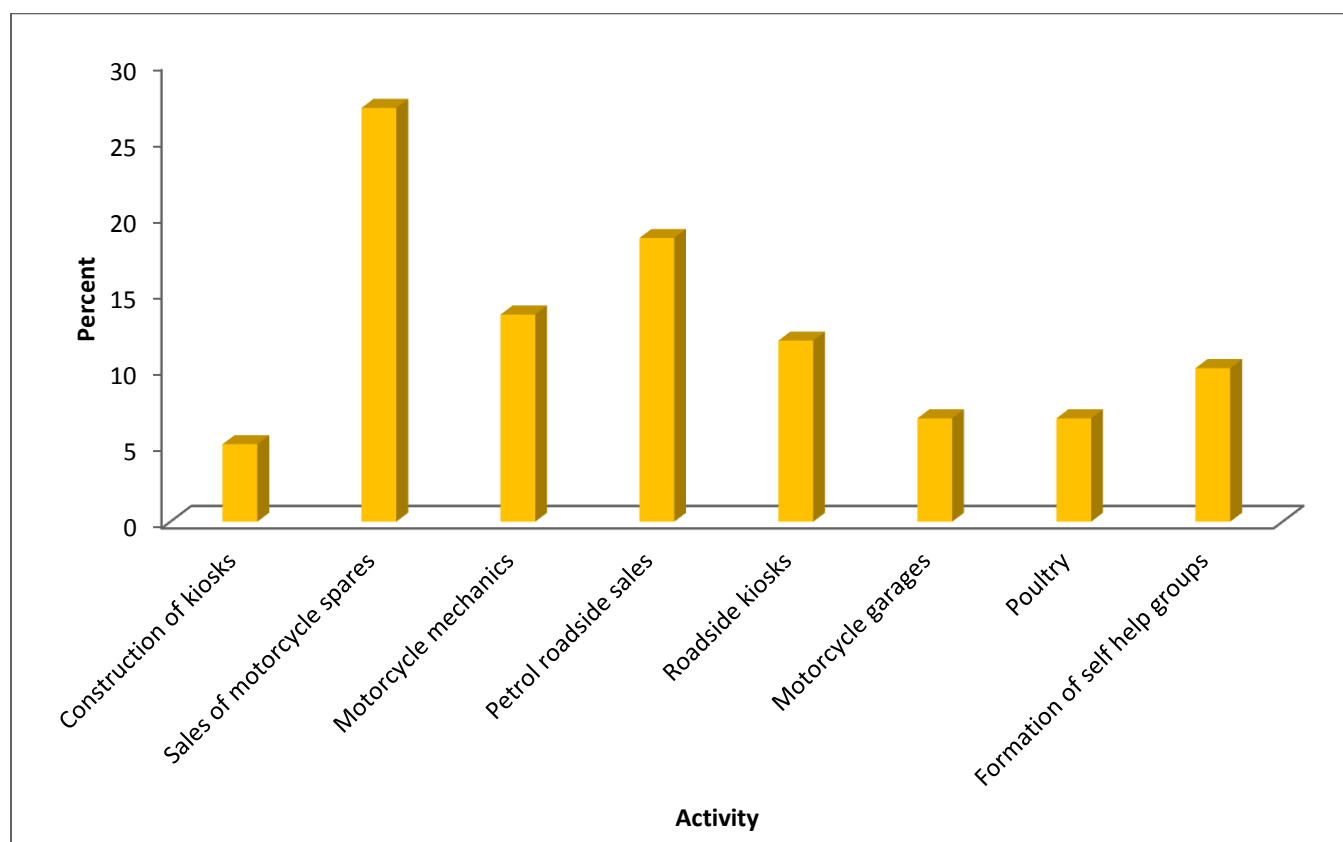
15. Are there challenges in commercial motorcycle business? Yes  No

16. If Yes, state the nature of challenges  
\_\_\_\_\_  
\_\_\_\_\_

17. Suggest how the challenges can be overcome.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



### Appendix III: Activities that have come up as a result of commercial motorcycle ridership



### Appendix IV: Percentage of agricultural inputs transported in Laikipia East Sub-County

Agricultural inputs transported	Responses	
	N	Percent
Fertilizer	60	65.2
Agro-chemicals	2	2.2
Seeds	1	1.1
Manure	9	9.8
Water	5	5.4
Insecticides	5	5.4
Herbicides	6	6.5
Maize seeds	4	4.3
<b>Total</b>	<b>92</b>	<b>100.0</b>

### Appendix V: Percentage of agricultural products transported in Laikipia East Sub-County

Agricultural products transported	Responses	
	N	Percent
Onions	20	7.8
Cabbages	47	18.2
Tomatoes	24	9.3
Carrots	21	8.1
Maize	45	17.4
French beans	1	0.4
Wheat	6	2.3
Oranges	2	0.8
Bananas	8	3.1
French peas	1	0.4
Beans	22	8.5
Potatoes	36	14.0
Green peas	1	0.4
Sukumawiki	7	2.7
Fruits	5	1.9
Sugarcane	1	0.4
Milk	3	1.2
Spinach	2	0.8
Eggs	3	1.2
Carrying piglets	1	0.4
Pineapples	2	0.8
<b>Total</b>	<b>258</b>	<b>100.0</b>

## Appendix VI: Suggestions on improvement of commercial motorcycles' business

Improvements	Responses	
	N	Percent
Construction of motorcycle sheds	15	9.2
Improvement of roads	24	14.7
Government funding	8	4.9
Reduction of petrol prices	19	11.7
Reduction of motorcycle spare parts prices	25	15.3
Reduction of motorcycle purchase prices	5	3.1
Provision of soft loans	5	3.1
Careful riding	1	0.6
High standard of cleanliness	1	0.6
Good personal relationship	1	0.6
More motorcycle riding training institutions	2	1.2
Stopping police harassment	4	2.5
Construct more petrol stations along the roads	1	0.6
Reduction of licence fees	6	3.7
Constructing new roads in the rural areas	1	0.6
Improvement of security	6	3.7
Creating conducive environment	2	1.2
Zero rating of taxes	1	0.6
Immediate response to theft cases	5	3.1
Centralise commercial motorcycle operations	2	1.2
Reduce licence fee	5	3.1
Reduce insurance fee	12	7.4
Finance youth	2	1.2
Training the motorcycle riders	5	3.1
Society's acceptance of the riders	3	1.8
Negotiation of riders and the government	1	0.6
Reducing theft cases	1	0.6
<b>Total</b>	<b>163</b>	<b>100.0</b>

## Appendix VII: Nature of challenges of commercial motorcycles' business

Nature of challenges	Responses	
	n	Percent
Police harassment	46	23.2
Insecurity	20	10.1
Bad roads	29	14.6
Customers' attitude towards commercial motorcycles riders	5	2.5
Police bribes	4	2.0
High price of petrol	18	9.1
High price of spare parts	9	4.5
Accidents	9	4.5
Lack of riding gear	1	0.5
Lack of standardized charges	4	2.0
Low business seasons	6	3.0
Theft cases	9	4.5
Breach of agreements between the riders and passengers	1	0.5
Bad weather conditions	19	9.6
Unpredictable passengers	1	0.5
High return targets	1	0.5
High purchase price of commercial motorcycles	1	0.5
Inexperienced commercial motorcycle riders	3	1.5
Limitation of access to some premises	1	0.5
High parking fees	1	0.5
Harassment by Council over cess payment	2	1.0
Lack of funds	3	1.5
Low quality of spare parts	2	1.0
Lack of motorcycle sheds	3	1.5
<b>Total</b>	<b>198</b>	<b>100.0</b>

**Appendix VIII: Table for finding a base sample size +/- 5% margin of error**

Population	Variability				
	50%	40%	30%	20%	10%
100	81	79	63	50	37
125	96	93	72	56	40
150	110	107	80	60	42
175	122	119	87	64	44
200	134	130	93	67	45
225	144	140	98	70	46
250	154	149	102	72	47
275	163	158	106	74	48
300	172	165	109	76	49
325	180	173	113	77	50
350	187	180	115	79	50
375	194	186	118	80	51
400	201	192	120	81	51
425	207	197	122	82	51
450	212	203	124	83	52
500	222	212	128	84	52
600	240	228	134	87	53
700	255	242	138	88	54
800	267	252	142	90	54
900	277	262	144	91	55
1000	286	269	147	92	55
2000	333	311	158	96	57
3000	353	328	163	98	57
4000	364	338	165	99	58
5000	370	343	166	99	58
6000	375	347	167	100	58
7000	378	350	168	100	58
8000	381	353	168	100	58
9000	383	354	169	100	58
10000	385	356	169	100	58
15000	390	360	170	101	58
20000	392	362	171	101	58
25000	394	363	171	101	58
50000	397	366	172	101	58
100000	398	367	172	101	58