

ROLE OF COMMERCIAL MOTORCYCLES IN PROMOTING AGRICULTURAL PRODUCTION IN KENYA: A CASE STUDY OF LAIKIPIA EAST SUB-COUNTY.

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Abstract

In the rural areas of many developing countries, intermediate means of transport (ITMs) such as motorcycles play a leading role in agricultural production. The main objective of this study was: to examine the contribution of commercial motorcycles in agricultural production in Laikipia East Sub-County in Kenya. The hypothesis tested was “there is no significant difference between adoption of motorcycles and agricultural production in Laikipia East Sub-County”. Questionnaire survey was administered to 66 respondents. Thorough literature search and review as well as field observations were used. Data was analysed using both descriptive and inferential statistics. Descriptive analysis included frequency counts, tables, bar graphs, pie-charts and percentages. The major findings were: (i) 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 χ^2 was greater than the critical χ^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; (ii) the study also found out that commercial motorcycle contributes 10% towards agricultural production in Laikipia East Sub-County, and that key activities which had come up as a result of commercial motorcycle operation generated gainful employment. The study recommended that the county government should construct feeder roads in order to encourage the introduction and operation of more motorcycles.

Keywords: Intermediate means of transport. Motorcycle; Agricultural production; Kenya

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Introduction

Road transport is essential for promotion and sustainability of agricultural production in Sub-Saharan Africa as it impacts positively on mobility (John & Carapetis, 1991), the adoption of high yielding varieties, high productivity crops and bigger farm size (Sieber, 1999). Rural transport mostly includes animal traction, car, truck, train and intermediate means of transport (IMT) such as motorcycle, bicycle, boat and canoe. These are the modes mostly suited for local transport problems with low and medium loads (Sieber, 1999). Intermediate modes of transport (IMT) are crucial to farmers' timely access to farm, markets and agro-services. However, the level of adoption may be loosely connected with availability of quality roads (Oyatoye, 1994).

According to Starkey (2016), access of people residing in rural areas to transport infrastructure and services is a notable factor that drives economic and social development. The role played by transport in rural development is diverse. Transport boosts agricultural production and prevents post harvest losses. Post harvest losses occur when harvests from the farms are lost on the way before reaching the consumers through the markets. Hoering (2012) pointed out that 10 to 20 percent of the grain harvest is lost during threshing, storage and transport. Such figures can be sharply reduced by improving transport infrastructure. Agricultural produce contribute directly to the food security, while sales provides income to producers.

However, the type of transport infrastructure in the rural areas of Laikipia County has deteriorated over time and most roads become impassable when it rains. Due to poor maintenance, major roads in the Sub-county have been overgrown by vegetation thereby making them narrow. This has been exacerbated by illegal roadside development, increased roadside farming; and poor land survey. The poor state of rural roads in Laikipia East Sub-county has made it difficult for motor vehicles to operate effectively, hence creating a big transport gap which has been bridged by commercial motorcycles and non motorized modes of transport.

Therefore, the main objective of this study was: to examine the contribution of commercial motorcycles in agricultural production in Laikipia East Sub-County in Kenya. The hypothesis tested was "there is no significant difference between adoption of motorcycles and agricultural production in Laikipia East Sub-County". Questionnaire survey, literature search and review as well as field observations were used for data collection. Data was analysed using both descriptive and inferential statistics.

Literature review

Intermediate Means of Transport (IMTs) and agricultural production

Tracey-White (2005) observed that mobility in rural areas could be hampered by the lack of transport facilities and unavailability of good roads. He noted that the mode of transport used, length and time of the journey and the costs of transport all affect the efficiency of marketing system and therefore farm output. He identified benefits attached to improved transport as: (i) that agricultural surplus reach collection centres and markets timely; (ii) a reduction of time burden for family members and (iii) a reduction in transport damages to perishable crops. In addition, an improved transport reduces operating costs to vehicle users and provides more direct and cost-effective access to public utilities. Hine & Ellis (2001) highlighted the importance of adoption of IMT to agricultural production in rural areas of developing countries. They identified the following effects on agricultural production and marketing: (a) cultivation of large farm areas, (b)

utilization of more fertile remote soils and heavier crops production, (c) increased utilization of fertilizer and manure, (d) reduction in effort and drudgery and spill-over effects if animals are used for ploughing and transport enabling farmers respond better to markets signals (Hine & Ellis, 2001).

A number of infrastructure constraints impede rural development. However, inadequate transport is a major impediment to agricultural growth in Sub-Saharan Africa (Platteau 2010; World Bank 2008b; Torero and Chowdhury 2005). Increased agricultural production is important to achieving the Sustainable Development Goals (SDGs), particularly for ending poverty (SDG1), achieving food security (SDG2) and ensuring healthy lives (SDG3). An efficient rural transport system is crucial to developing agriculture and reducing rural poverty. Reducing rural transport costs can raise farm-gate prices, increase farmers' incomes and help reduce the price of food in urban areas. It can also facilitate timely distribution of farm inputs (e.g. fertiliser, insecticide), increase agricultural yields and extend cultivated areas, and reduce post-harvest losses.

One reason for the central role of rural transport in agriculture is that transport systems affect farm growth through their influence on the physical access that farmers have to markets, as well as the prices they face. Poor rural transport systems increase the costs of marketing to and from farm areas, inhibit product flows, limit the spread of information, and increase risk. These factors contribute to high and unstable spatial marketing margins and they lead to unremunerative producer prices and higher prices for purchased inputs. They also undermine farm profitability and ultimately investment and growth in an environment of weakly integrated and unstable agricultural markets. Agriculture also has a reciprocal effect on the viability of transport investments. The structure and performance of the farm sector and the volatility of agricultural production and weather have a significant influence on the rate of return from rural transport investments. Thus, the economic viability of rural transport investments depends on the appropriateness of infrastructure investments to a given area's agricultural production and marketing systems and to the resource endowments and conditions (including weather and climate change) that affect investment viability. Moreover, as argued earlier, the returns on rural transport investments also depend on the characteristics of farm structure, including the types and amounts of production and marketing undertaken in a given area, and the associated transport and processing (vertical integration) requirements. Other factors are the degree of farm spatial concentration (affecting assembly requirements and costs); the value of marketed farm production; the size and commercial orientation of farms; and the extent to which farmer marketing groups exist and can achieve economies of scale in local markets, allowing assembly of larger loads with lower unit transport costs.

Most rural communities depend on agriculture (e.g. crops, livestock, fisheries, forestry) for income generation; thus, improving agricultural production can provide economic justification for constructing and maintaining low-volume rural roads (LVRRs). A study in Madagascar suggested that a new rural road can increase incomes of the remotest households by about 50 % (Starkey & Hine, 2014).

For most farmers with limited harvests, load consolidation at markets, buying posts or truck stops is crucial to achieve economies of scale through lower transport costs. A study in Nyeri County, Kenya found that the costs of transporting onions over the first two kilometres accounts for around 10% to 20% of the net income that farmers would derive from sale and production. Due to difficulties of using trucks on low-quality tracks close to farms, produce had to be transported by humans, motorcycles, and animal carts. The study found that these forms of transport cost 16 to 30 times more on a per tonne-km basis than truck transport.(Starkey & Hine, 2014).

Well functioning agricultural markets are essential for rural growth and poverty reduction. Most rural households are connected with markets, as sellers of produce and/or buyers of food, and access to reliable produce markets enables farming households to commercialise their production systems and increase their farm incomes (IFAD Rural Poverty Report 2011). Smallholder food production is undermined by high transaction costs, low market power and limited access to finance services and infrastructure (Neven 2014). Multiple transactions between different wholesalers and retailers can increase the price difference between farmer and retailer with little real value added, as shown in the following illustration of the Ghanaian maize market. One way of increasing incomes is to engage in direct contract-farming with supermarkets.

Several major comparative studies indicate that freight transport tariffs have been up to six times higher in Africa than in Asia, for comparable journeys. Although many of these studies relate to long-distance travel, the same patterns of inefficiency were also found for short-distance rural transport movements (Ellis & Hine, 1998). Earlier studies emphasized high input costs and low utilisation in Africa, and a recent study emphasises high transport profits in Africa due to cartels, operator associations and freight queuing systems (Rizet & Hine, 1993; Teravaninthorn & Raballand, 2009). High transport costs and inefficient marketing directly influence farmer and retail prices. A comparative study found that average food grain producer prices. As a percentage of final market prices ranged from 75 to 90% in Asia and only from 30 to 60% in Africa. Transport costs accounted for 27.5% of average market prices in Kenya and Malawi compared with 13.8% in Bangladesh and Indonesia (Ahmed & Rustagi, 1987).

Growing importance of Commercial Motorcycles

The literature reviewed so far, underlines the growing significance of intermediate means of transport in developing countries of which motorcycles is an important component. The rapid spread of motorcycles as a common means of rural transport has been quite remarkable. In many countries in the world, the majority of vehicles operating on low-volume rural roads are now motorcycles. This is true of many countries in Africa, Asia and Latin America. Thirty years ago, one might see some mopeds and motor scooters in urban areas, a few medium-size, Japanese, 'trail' motorcycles used by agricultural extension officers and NGO personnel, and a very small number of powerful motorcycles used by the police or rich enthusiasts. Things began to change in the 1990s when China, India and some other Asian countries started mass producing medium-sized motorcycles.

Now in most developing and emerging countries, motorcycles are common in rural areas and are increasing rapidly. A decade ago, the use of motorcycles on rural roads was well established in many South Asian and Southeast Asian countries and in a number of African countries (notably Burkina Faso, Benin, Nigeria, Cameroun, Uganda, Kenya and Rwanda). In some other countries, ten years ago, motorcycle numbers were low, but have been steadily increasing ever since. Examples include Ethiopia, Ghana, Malawi, Mozambique, Sierra Leone and Tanzania. For example, in Tanzania, registered motorcycles have increased by a remarkable 40,000%, from under 2,000 motorcycles in 2003 to over 800,000 in 2014 (Bishop and Amos, 2015).

The rapid spread of motorcycles has been 'spontaneous' and unplanned, with little or no public sector promotion or involvement, other than that related to compliance with fiscal requirements and some road safety regulations. While associated with overall global liberalisation of trade and general reductions in national import tariffs, it has been led by lower cost supplies and a strong latent demand of people for greater mobility for economic and social benefits.

The initial 'first-mile' stages of crop movement, from farm collection to secondary roads, are the most expensive and pose the greatest obstacles to the development of agriculture in rural areas. The costs of first-mile transport may account for over a fifth of total transport costs in the transport chain. First-mile movements usually involve transporting crops by humans (e.g. head load or backload) or IMTs (e.g. non-motorised or animal transport), before being transferred to multi-purpose light goods vehicles. Many crops lose value through handling and transport over rough paths and tracks.

Recognising that in many of the poorest areas of rural Africa, domestic travel for water, firewood and food processing needs account 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.

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, *et. al.*, 2013).

Theoretical and conceptual consideration

Functional 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 measure 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.

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. 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.

Materials and Methods

Study Location

The study covered Laikipia East Sub – County of Kenya (Figure 1). Laikipia East Sub-County was chosen because in recent times there has been a rapid growth in commercial motorcycles. This being an agricultural area, it was important to examine the role if any that commercial motorcycles would play in promoting agricultural production.

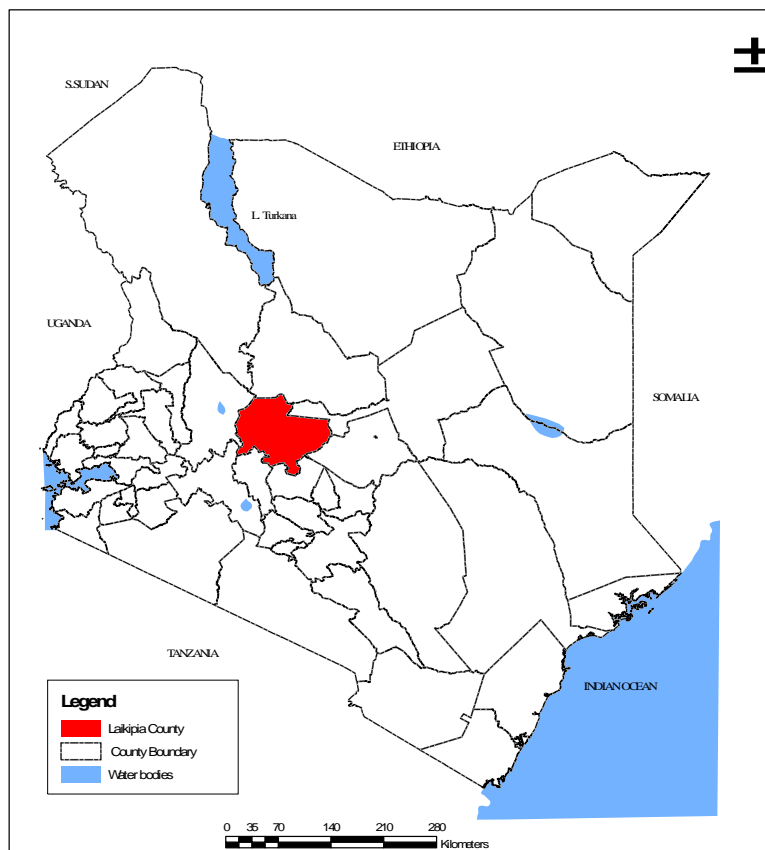


Figure 1: Location of Laikipia County, Kenya

Nanyuki Town is the Laikipia County headquarters. 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 specialised 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.

Research Design

The research design used is a case study design of Laikipia East Sub- county in Kenya. This involved detailed analysis of the contribution of commercial motorcycles in promoting agricultural production in the case study. Both qualitative and quantitative approaches were used.

Sampling

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.

The sample size of each stratum is proportionate to the population size of the stratum. Strata sample sizes are determined by the following equation: $nh = (N_h / N) * n$ where nh 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. The sample size of each stratum is proportionate to the population size of the stratum. The sample sizes are determined by the following equation: $nh = (N_h/N) * n$. Where nh 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. 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. Stratified sampling was used to sample the location of *bodaboda* operators. Simple random sampling was used to sample *boda boda* operators. The sample size was determined using the following formula. $n = (NCv^2) / (Cv^2 + (N-1)e^2)$ (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

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

$$n = 153 \times 0.52 / (0.52 + (153-1)e^2)$$

$$n = 61$$

The sample size and distribution are shown in table 1.

Table 1: Distribution of sample size according to Locations in the study area

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

Source: Field data (2015)

Data collection procedures

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. 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.

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.

The study hypothesis was tested using Chi-Square (Table 2). 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.

Table 2: Calculation of the Chi-square (χ^2) for hypothesis (i)

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

Source: Field Data (2015)

From Table 2 deduction was made from the tested hypothesis thus:

H_0 There is no significant difference between promotion of agriculture and commercial

Motorcycles' frequency in Laikipia East Sub-County. Calculated (χ^2) = **20.77**. At 0.05 significance level and at 4 degrees of freedom, Critical (χ^2) = **9.49**. Since the calculated value of (χ^2) is greater than the critical (χ^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.

Results and Discussion

Commercial motorcycles' socio-economic characteristics

The spread of respondents' age categories as shown in Table 3 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 3: Age category of respondents in years

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 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 (Table 4). This is perhaps attributed to the cultural feeding habits of the people of Laikipia East and the agricultural practices of the area.

Table 4: Agricultural products transported by commercial motorcycles in Laikipia East Sub-county

Agricultural products transported	Responses	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: Field 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.

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.

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.

The role of commercial motorcycles in promoting agriculture

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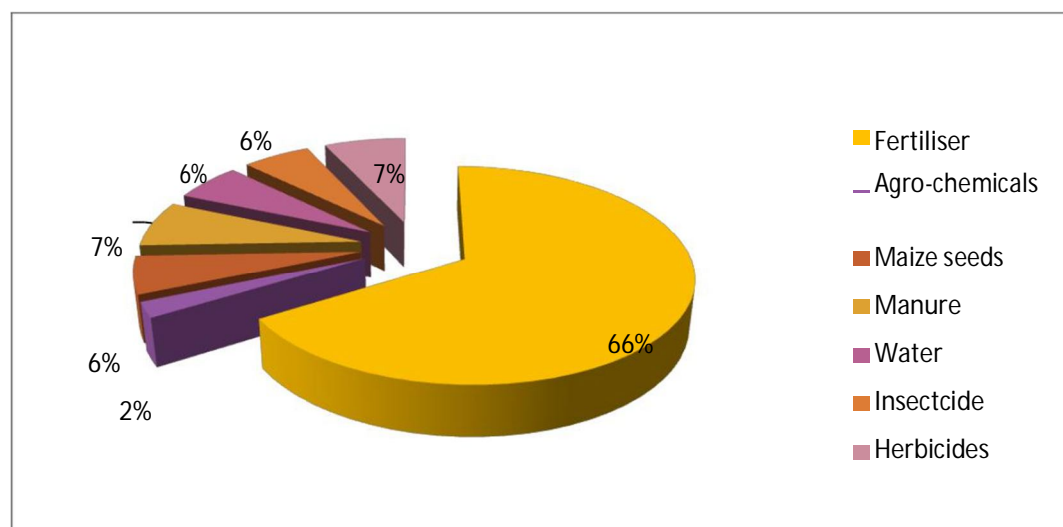
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Source: Fieldwork Data (2015)

Figure 2: Volume of agricultural inputs transported by commercial motorcycles per month in Laikipia East Sub-county per month.

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Conclusion and Policy recommendations

It has been established that commercial motorcycles play an important role in promoting agricultural production in the study area. Commercial motorcycles transport both farm inputs and farm products. This is extremely important in an agriculturally productive area. In order for the commercial motorcycles to play a greater role in the region it is recommended that there should be a reduction of insurance fee, licence fee, cost of spare parts and 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. It is also

necessary to enforce traffic regulations including mandatory wearing of helmets to reduce accidents when transporting goods and passengers.

The study also recommends that intensified effort should be made by both county and central governments to rehabilitate bad roads and construct commercial motorcycle lanes in Laikipia East Sub-County. There should also be thorough training and retraining of motorcycle operators in order to be able to transport agricultural produce to the market without being damaged. In addition, an accurate data base should also be maintained and frequently updated to help facilitate effective 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.

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 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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