

**ROAD INFRASTRUCTURE AND AGRICULTURE PRODUCTION IN KISORO DISTRICT: A
CASE STUDY OF CENTRAL DIVISION KISORO MUNICIPALITY**

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ABSTRACT

The primary goals of the study were to determine the level of road infrastructure growth in the central division of Kisoro District, the level of agricultural output in the central division of Kisoro District, and to determine whether there is a connection between road buildings and agricultural production in the central division of Kisoro District. The study focused on the connection among road infrastructure and agricultural production in the Kisoro district. The comments were all grouped accordingly to their theme categories and the information they contained were evaluated for the qualitative information using content analysis techniques. Figures and tables were used for the presentation. Software from the Statistical Package for Social Sciences (SPSS) was employed to assist in data analysis. The results showed that the area's level of agricultural was high (17, 38.6%), very high (14, 31.8%), very low (9, 20.5%), and low (4, 9.1%). According to the investigation, there was a fairly strong correlation between road infrastructure and agricultural production in the area. These vital waterways supported agricultural growth and were an essential component of both the city and the region that served it. Road development should be prioritized for a comprehensive transformation of the land for farming in order to fully realize an area's possibility of farming, especially in the Kisoro district. All sorts of farmers should have enough access to markets thanks to a well-maintained road system that includes trunk highways, line roads, approach roads, and village roads.

Key words: road infrastructure and agriculture production

Background of the study

Since they are used to transport commodities and amenities from one location to

another, infrastructure improvements on roads require substantial expenditures (Jedwab and Moradi 2016). Approximately 75% of freight and passenger transportation in Sub-Saharan Africa is still done on road infrastructure (Beuran et al. 2015). Given that approximately 50% of the roads in the Sub-Sahara region have not yet been built, it follows that the construction of road infrastructure continues to rank highly among other physical infrastructure enhancements in these cities, with possible repercussions for the economic status and physical environments of the cities and their peri-urban areas (Gachassin et al. 2010; Cobbinah et al. 2015). According to a World Bank study on the factors influencing pricing in Africa, the longest and largest rise in commodity prices since World War II began in 2005. The present study expands the scope by emphasizing six agricultural products and determines the relative weights of key measurable drivers of their prices. According to Uganda's 2017/2018 monthly market monitor, the nation's median retail prices for grain such as maize and beans are comparatively stable in Northern Uganda at 20% as opposed to 30% in 2017, but they rose by 8% overall due to a lack of supply, with Mbale having the most expensive prices.

Problem statement

The region offers a significant potential for agricultural output, including the raising of cattle and the growing of commodities including coffee, tea, bananas, and vegetables. However, the Kisoro District's current road system is insufficient and poses serious difficulties for the agricultural industry. Farmers find it challenging to transport their agricultural products to markets or factories for processing due to the district's lack of well-maintained and effectively interconnected highways. The current roads are frequently in poor condition, have potholes, poor drainage, and inadequate signage, which results in delays, harm to agricultural products, and higher expenses for transportation. Farmers in the Kisoro District struggle to get access to crucial agricultural supplies like fertilizer, seeds, and equipment because of the district's subpar road system. Due to bad road conditions, it is difficult for manufacturers and distributors to reach outlying

locations, which results in a limited supply and higher input prices. Farmers' performance is hampered by this scenario, which also has an impact on the district's total agricultural revenue. The study's goal was to close the gap between crop production and transportation facilities.

Specific objectives

- 1. To find out the level of Road infrastructural development in central division in Kisoro District.*
- 2. To find out the level of Agricultural production in central division in Kisoro District.*
- 3. To assess whether there is a relationship between Road infrastructure and Agricultural production in central division in Kisoro District.*

Research questions

- 1. What is the level of Road infrastructures in central division in Kisoro District?*
- 2. What is the level of Agricultural production in central division in Kisoro District?*
- 3. What relationship does Road infrastructure holds with Agricultural production in central division in Kisoro District*

Methodology

Research Design

A descriptive survey design was used for the investigation. This was so that it could be determined how frequently the phenomenon occurred and whether there were any existing correlations between all of the variables. The descriptive survey technique was used because a cross-sectional approach was helpful in getting a sense of the overall situation at the time the study was conducted. Cross-sectional research studies were relatively simple and inexpensive to conduct (Kumar, 2005).

Target Population

A population, as defined by Best and Kahn (1989), is a collection of people who share one or more traits that the investigator is interested in. A target population, according to Lokesh (1988), is a sizable group from which an individual population is chosen. While Barnet (1999) describes community as a whole group of humans' causes or goals that have some universally perceptible traits. The investigator focused on the community in the Kisoro district, which comprises local farmers, in order to achieve the goals of this study. irrespective of their age, gender, or degree or function held, the sample group to be used when supplying the data necessary for the purposes of the study.

Sampling Procedures

Sample Size

The study sample was comprised of 59 respondents from those who practice farming out of 60 of the total population, and was derived from using the Slovin's formula below;

$$n = N / (1 + Ne^2)$$

Where n= Sample size

N= Total population

e= error tolerance of 0.02 $n = 60 / (1 + 60(0.02)^2)$

$$n = 60 / (1 + 60 (0.0004))$$

$$n = 60 / (1 + 0.024)$$

$$n = 60 / 1.024$$

$$n = 59 \text{ respondents}$$

Hence, 59 respondents were considered to participate in the study.

As a result, according to Slovin's formula, 02 extensive farmers and 57 sole proprietors in the Kisoro District made up the original population. Due to budget and time limitations, as well as the fact that everyone in the group more or less shared similar socio-demographic traits. The respondents of the survey were extensive farmers in the Kisoro District and sole proprietors who had been engaged in their practices for at least ten years.

Table 1. Shows different Categories of the People that were in the Study sample with them

Sizes.

<i>Population (N)</i>	<i>Target</i>	<i>Sample</i>
<i>Subsistence farmers</i>	<i>57</i>	<i>57</i>
<i>Extensive Farmers</i>	<i>03</i>	<i>02</i>
<i>Total</i>	<i>60</i>	<i>59</i>

Sampling techniques.

Sampling Techniques

Only a deliberate non-probability sampling strategy was used by the investigator. Orodho (2013) defines a sample with a purpose as one that is chosen by the investigator arbitrarily, that is, affected by one's own views, in an effort to obtain a sample that appears to be comparable to the population. This type of sample will typically try to include a range from one end of the spectrum to the other. Only the small-scale and widespread farmers in Kisoro Central Division, Kisoro District, were taken into account by the investigator. These were supposed to provide information that was pertinent to the study's goals.

Simple random sampling

The respondents in this study were local farmers as primary respondents. Simple random sampling was used to select respondents in the group of farmers within the central division of Kisoro District. A total of 57 local farmers from Kisoro central division, participated in the study and their selection involved simple random sampling and specific attention was paid to inclusion of both male and female farmers in the study school.

Purposive Sampling

In addition, there was no way to guarantee that the sample was actually accurately representing the population, therefore the investigator's capacity to evaluate the population's constituent parts was given additional weight. As a result, the researcher employed this approach to include extensive farmers in his sample. The investigator had no idea as to whether the instances chosen were representative of the population while using purposive sampling. Most methods of sampling were thought to be of a purposeful character since sample issues were typically addressed with a predetermined plan in mind. was more crucial than gathering a sample of likelihood.

Data collection methods

Any study required appropriate data collection methods with which to collect the necessary information that can ably answer the study questions (Mugenda & Mugenda, 2003). Lewis (2003) gave a distinction between primary and secondary data and each set of data required an appropriate and relevant collection technique.

Data Analysis

To find and correct mistakes made by respondents, data was modified. The answers provided to the questions were then coded into several categories. The data were analyzed using descriptive statistics like distributions of frequencies and ratios. The comments were all grouped accordingly to their theme categories and their contents were evaluated for qualitative data using content analysis methods. Figures and tables were used for the presentation. Software from the Statistical Package for Social Sciences (SPSS) was employed to assist in data analysis.

RESULTS

Response Rate

Out of 59 questionnaires administered to respondents, 44 questionnaires were

filled and returned. This gives an approximate response rate of 75 per cent. According to Mugenda (2003), 50 percent response rate is adequate, 60 percent good and above 70 percent rate very good. This means the response rate of 75% is satisfactory for the purpose of making conclusions for the study. The response rate by category of respondents is summarized in Table 1

Table 1. Response rate

Respondents	Issued	Returned	Percentage (%)
Subsistence and Commercial farmers	59	44	75

Bio-data of the Respondents

Bio-data is pertaining to respondents' gender, age, level of education, and marital status of respondents in central division in Kisoro Municipality, the issues relating to the demographic data are discussed below.

Respondents' Gender

The respondents were asked to indicate their gender, this was aimed at establishing whether both genders participated in the study. The gender distribution of respondents for both subsistence and commercial farmers were as indicated in Table 2

GENDER OF RESPONDENTS			
	Frequency	Percent	Valid Percent
Female	21	47.7	47.7
Male	23	52.3	52.3
Total	44	100.0	100.0

Table 2: Respondents' gender

Source: Primary Data, 2022

The data in Table 2 above shows that 47.7% of the respondents were female while 52.3% were males this confirms that both genders participated in this study as shown in the table above.

Respondents' age

The respondents were asked to indicate their ages. The results are shown in the Table 3 for 44 Subsistence and Commercial farmers

AGE OF RESPONDENTS			
	Frequency	Percent	Valid Percent
15-20 Years	4	9.1	9.1
21-25 Years	14	31.8	31.8
26-30 Years	11	25.0	25.0
31-35 Years	7	15.9	15.9
36-40 Years	2	4.5	4.5
41-45 Years	1	2.3	2.3
46-50 Years	2	4.5	4.5
50 and above	3	6.8	6.8
Total	44	100.0	100.0

Table 3. Respondents' age

As illustrated in the table 3, the research found out that the majority 14(31.8%) of the farmer's respondents were aged between 21-25 years, 11(25.0%) were aged 26-30 years, 7(15.9%) were age between 31-35 years, 4(9.1%) were aged 15-20 years, 3(6.8%) were age between 50 and above, 2(4.5%) were age between 36-40 years, 2(4.5%) were age between 46-50 years, and 1(2.3%) were age between 41-45 years.

This implies that findings were from fresh minded and experienced respondents most of who were appropriately knowledgeable respondents.

Respondents' level of education

Respondents were asked to indicate their level of education. The results are indicated below in table 4 for farmers.

RESPONDENTS LEVEL OF EDUCATION			
None	1	2.3	2.3
Primary	4	9.1	9.1
O' level	9	20.5	20.5
A' level	13	29.5	29.5
Diploma	8	18.2	18.2
Degree	9	20.5	20.5
Total	44	100.0	100.0

Table 4. Respondents' level of education

Source: Primary Data, 2022

Table 4 illustrates that the highest percentage of farmers who returned the questionnaires had

an A' level 13(29.5%), 9(20.5%) had a O' level, 9(20.5%) of the farmers had a degree, 8(18.2%) had a diploma, 4(9.1%) had stopped in primary, and 1(2.3%) had no level of education.

Respondents' Marital Status

Respondents were asked to indicate their marital status. The results are indicated below in table 5 for the farmers.

MARITAL STATUS OF RESPONDENTS			
	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Single</i>	17	38.6	38.6
<i>Married</i>	27	61.4	61.4
<i>Total</i>	44	100.0	100.0

Table 5. Respondents' marital status

Source: Primary Data, 2022

Table 5 indicates that the highest percentage of farmers 27(61.4%), who returned the questionnaires had married, 17(38.6%) were single in Kisoro central division in Kisoro Municipality.

Description of the Road infrastructure

This section describes the independent variable (road infrastructure) in section B in the questionnaire. It includes the definition of roads infrastructure, roads used during transportation of agricultural produce, the distance from plantation to the road, the level of road infrastructure in your area.

TYPES OF ROADS USED WHILE TRANSPORTING CROPS PRODUCE BY

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Tarmac</i>	14	31.8	31.8
<i>Marram</i>	20	45.5	45.5
<i>Feeder</i>	10	22.7	22.7
<i>Total</i>	44	100.0	100.0

Table 6. Types of Roads used by respondents

Source: Primary Data, 2022

Table 6 clearly illustrates that marram roads are used mostly by the respondents during transportation of their crop produce with 20(45.5%) compared to tarmac roads with 14(31.8%) and feeder roads with 10(22.7%).

Table 7: showing the distance from respondents' plantations to the road.

DISTANCE OF YOUR PLANTATION FROM THE ROAD			
	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Very far</i>	14	31.8	31.8
<i>Far</i>	16	36.4	36.4
<i>Very short</i>	5	11.4	11.4
<i>Short</i>	9	20.5	20.5
<i>Total</i>	44	100.0	100.0

Table 7. Distance of your plantation from the road

Source: Primary Data, 2022

The preceding table 7 conveys that most of the respondents' plantations are far with 16(36.4%), very far with 14(31.8%) to the roads, short with 9(20.5%), and very short with 5(11.4%) to the road.

Table 8: Shows the level of road infrastructure in the area used by respondents.

LEVEL OF ROAD INFRASTRUCTURE IN YOUR AREAS			
	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Very high</i>	10	22.7	22.7
<i>High</i>	21	47.7	47.7
<i>Very low</i>	6	13.6	13.6
<i>Low</i>	7	15.9	15.9
<i>Total</i>	44	100.0	100.0

Table 8. Level of road infrastructure in the area

Source: Primary Data, 2022

The preceding table 8 conveys the level of roads infrastructure in the area are high with

21(47.7%), very high with 10(22.7%), low with 7(15.9%), and very low with 6(13.6%).

Description of Agricultural produce

This Section describes the dependent variable (Agricultural produce). In this study, Agricultural output was conceptualized to frequencies and percentages obtained in types of farming, level of Agriculture in your district, types of crops grown, the relationship of road infrastructure on agricultural production, and challenges faced in agriculture.

Table 9 showing the type of farming respondent's practice.

TYPES OF FARMING YOU PRACTISE			
	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Subsistence farming</i>	22	50.0	50.0
<i>Commercial farming</i>	22	50.0	50.0
<i>Total</i>	44	100.0	100.0

Table 9. Types of farming practice

Source: Primary Data, 2022

Table 9 shows that 22(50.0%) of the respondents practice subsistence farming are the same with those of commercial farming with 22(50.0%). Thus, both of them do subsistence farming and commercial farming.

Table 10 showing the level of Agriculture in the respondent's district.

LEVEL OF AGRICULTURE IN YOUR AREA			
	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>
<i>Very high</i>	18	40.9	40.9
<i>High</i>	16	36.4	36.4
<i>Very low</i>	8	18.2	18.2
<i>Low</i>	2	4.5	4.5
<i>Total</i>	44	100.0	100.0

Table 10. Level of agriculture in the area

Source: Primary Data, 2022

The preceding table 10 conveys the level of Agriculture in the area are very high with

18(40.9%), high with 16(36.4%), very low with 8(18.2%), and low with 2(4.5%).

Thus, the level of agriculture in the area is very high according to the research shown above in table 10.

Table 11. Showing the relationship of road infrastructure on agriculture as shown below.

THE RELATIONSHIP OF ROAD INFRASTRUCTURE ON AGRICULTURAL PRODUCTION			
	Frequency	Percent	Valid Percent
Very high	14	31.8	31.8
High	17	38.6	38.6
Very low	9	20.5	20.5
Low	4	9.1	9.1
Total	44	100.0	100.0

Table11. Relationship of road infrastructure on Agricultural production

Source: Primary Data, 2022

The preceding table 11 conveys the level of Agriculture in the area are high with 17(38.6%), very high with 14(31.8%), very low with 9(20.5%), and low with 4(9.1%).

Thus, the relationship between road infrastructures on agricultural production in

the area is very high according to the research shown above in table 11.

Conclusions

The researcher concluded on this objective from the findings that the road infrastructure is high and this is due to many factors which include presence of many farms, high demand for agricultural output, and markets.

The researcher concluded on this objective that the level of Agricultural production is very high and this is due to vast land cultivation, presence of variety crops to be planted, and favorable climatic conditions of the area.

Recommendations

The arteries of an economy, roads are its lifeblood. These vital routes support agricultural growth and are an essential component of a city and the region that serves it. Road development should be prioritized for a comprehensive transformation of the agricultural land in order to fully realize an area's the possibility of agriculture, particularly in the Kisoro district. All different types of farmers will have proper means of getting to markets thanks to the road network, which consists of trunk highways, line roads, approach roads, and village roads. Road accessibility is a basic need for the development of a region's intrinsic agricultural potential because transport by road is crucial for the selling of cereals, vegetables, and fruit.

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