
MANURE AND CROP PRODUCTION IN KISORO DISTRICT: A CASE STUDY OF KISORO MUNICIPALITY

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ABSTRACT

The main aim of this study was to find out whether manure has an effect on crop production in Kisoro Municipality Northern Division Kisoro District. A simple (random) chance sampling strategy was used to choose a sample size of 341 respondents from the intended population of 3000 participants for the study. It used a combination of a descriptive and empirical methodology. 212 males and 129 females made up the sample. This was due to the fact that for every garden dimension provided by those who participated, it was demonstrated that at least 10 sacks of Irish potatoes could be gathered when manure was applied, as opposed to only 5 sacks when it wasn't. Participants argued, however, that the aforementioned assessments were reliant on environmental variables including the fertility of the soil and weather variations. Since the highest amount of importance required to declare an important connection between manure and agricultural output was 0.01, the results showed a substantial positive correlation between manure and crop manufacturing at $r = 0.705$; this implied that when the level of fertilizer usage was high, the level of crop manufacturing was also high, and when the level of manure usage was low, the level of crop goods. There was a need to design effective manure handling and storage systems that reduce loss of nutrients after excretion and during composting, and to explore the viability of community-based manure collection initiatives at the farm level where manure transportation costs are shared and hence minimized and finally farmers should capture urine, as it assists in decomposition of the waste heap.

Key words: Manure and Crop Production

Background of the study

Manure is an organic material that is primarily made up of animal feces, with the exception of green manure, which can be utilized as a fertilizer made from organic matter in the agricultural sector, as defined by Bernal, M. P., et al. (2009).

Additionally, manure is defined by Merriam Webster (2010) as animal excrement, typically mixed with straw, used to fertilize land. Manure is defined by Wortman, Sam, E., et al. (2017) as a mixture of animal waste (such as dung and urine) and litter with a high-water content. Manures are animal and plant feces that are used as plant nutrition sources. Based on the amount of each of the vitamins and nutrients, manures can be divided into bulky organic manures and condensed organic manures (Das, S., et al., 2017).

Based on Okello Ibrahim's 2009 study in Uganda, it was discovered that in when American Upland cotton was first imported to Uganda in 1904, it quickly took over as the nation's primary export, delivering with it a moderate affluence that many other African nations admired. Defects in cotton advertising and ginning that progressively became obvious led to legislation being passed in 1926 and later that governed the sector quite tightly. A license was required for both the building and the running of gins², and advertising was restricted to a specific season. Purchasing had to take place within specific geographic boundaries in order to prevent the mixing of kinds. Due to the overwhelming number of gins created, several became "silent" and were only used occasionally.

Statement of the problem

The farming sector is crucial to the Kisoro District's economic growth and food security. Nevertheless, the district encounters difficulties in using manure for agricultural production effectively.

Kisoro District farmers are only dimly aware of the advantages and effective application of manure in the cultivation of crops. Because of this lack of knowledge, Kisoro District may have restricted access to high-quality sources of manure, such as vegetative matter and livestock dung, which could result in inferior crop yields. This lack of manure supply may make it difficult for farmers to apply enough of it to their fields, which would reduce the fertility of the soil and crop yield. Nutrient losses and disparate distribution throughout fields might result from improper manure processing and application methods. Finding out whether there was a connection between crop productivity and manure in Kisoro Municipality, Kisoro District, is therefore an issue.

Specific objectives

- 1. To find out the extent of manure usage in Kisoro Municipality.*
- 2. To find out the level of crop production in Kisoro Municipality.*
- 3. To find out the relationship between manure and crop production in Kisoro Municipality.*

Research questions

- 1. What is the extent of manure usage in Kisoro Municipality?*
- 2. What is the level of crop production in Kisoro Municipality?*
- 3. What is the relationship between manure and crop production in Kisoro Municipality?*

Methodology

Research Design

A descriptive research design is used to describe what is present in relation to the variables or circumstances in a situation and to learn about the current status of the phenomenon (Anastas & Jeane W., 1999). In order to gather more detailed information

from the field, the investigator employed this approach to discover and characterize the answers to some study questions. Graphs, pie charts, and tables were used to convey quantitative data. The analytical character of the qualitative method of study helped the investigators achieve the study's goals. Variables that cannot be accurately quantified with numbers and statistics were assigned using statements. In the quantitative study approach, variables that might not be easily measured were assigned numerical values and statistics.

Target population

The entire population or group that an investigator finds fascinating in studying is known as the target population (Muhammad, 2006). Clustered sampling was utilized by the investigator to gather respondents to the study. The sample of participants is divided into clusters, which are groupings that are chosen at random to be a part of the study. Individuals in the clusters always have specified features.

Sampling procedures

Sampling procedure refers to choosing part of a population to use to test hypotheses about the entire population (Jowin, 2003). The procedures included simple random sampling and purposive sampling and was used to select respondents in the study.

Sample size

Out of 85 people who participated in the study, 70 were participants; 40 of them were from the community, and 28 were farmers. The 01 District Agricultural Officer and the 01 LC1 Chairman were regarded as the study sample's major respondents. Due to budget and time limitations, as well as the fact that the population more or less shared similar social and demographic characteristics. Community members, farmers, the chairwoman of the local council I, and the district agricultural officer of the Kisoro District were among the responses to the conversation.

Table 1: Shows how the participants were selected

<i>Study Population</i>	<i>Target population</i>
<i>District Agricultural Officer</i>	<i>01</i>
<i>Local Council Chairperson</i>	<i>01</i>
<i>Community members</i>	<i>40</i>
<i>Farmers</i>	<i>28</i>
<i>Total</i>	<i>70</i>

Source (Field Data, 2022)

Sampling techniques

Ahuja Ram (2010), defines sampling as the act or process of selecting a suitable sample of the population for the purpose of determining parameters of characteristics of the whole population, and these can be either probability or non- probability sampling techniques.

Simple random sampling

Simple random sampling was used to select respondents in the group of community members. A total of 40 community members and 28 farmers in Kisoro Municipality, Kisoro District participated in the study and their selection involved simple random sampling and specific attention was paid to inclusion of both male and female respondents in the study area.

Purposive sampling

District agricultural officer and chairperson. This method is founded on the study's goal and the distinctive features of a population. This method was employed by the investigator because it is extremely helpful in circumstances when you must quickly achieve a specified sample and where sampling for proportionality is not the major issue. Only those people who are pertinent to the research design are chosen through purposeful sampling, which is less expensive, more easily available, and more comfortable.

Data collection methods and instruments

According to Syed Muhammad Sajjad Kabir (2016), data collection is the process of acquiring data and analyzing data pertaining to relevant variables in a predetermined systematic way that allows one to respond to specified research questions, test hypotheses, and assess results. The researcher will utilize both secondary and primary data methods to gather information about data that is qualitative as well as quantitative. In order to gather data, various techniques including questionnaires and interviews were used. These were employed to gather information from landowners and locals in Kisoro Municipality, Kisoro District.

Data analysis

The statistical package for social science (SPSS) tool was used by the investigator to compute proportions, frequency, and tabulate responses, as well as to employ a variety of qualitative and quantitative types of data. To find and correct mistakes made by participants, 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 proportions. The answers were all grouped according to their theme categories and their contents were evaluated for qualitative data using content analysis. Presentation materials included tables, charts, and figures. Software from the Statistical Package for Social Sciences (SPSS) was employed

to assist in data analysis.

RESULTS

Response rate

Questionnaire return rate

All the 70 questionnaires were given out, 60 were returned, thus representing 85.7% response. The study was considered good because according to Peil (1995), questionnaire return rate above 50% is considered good for a study.

Personal information of respondents

Information regarding to the personal background of the respondents included their age, gender, marital status, occupation, and education level

Age of the respondents

Information regarding the age of the respondents was added to questionnaires during the piloting process. The following information regarding the ages of the respondents was analyzed using SPSS Software and presented in form of grouped data as shown in the table 1

AGE OF RESPONDENTS					
Frequency		Percent		Valid Percent	Cumulative Percent
Valid	0-10	3	5.0	5.0	5.0
	10-20	1	1.7	1.7	6.7
	20-30	7	11.7	11.7	18.3
	30-40	28	46.7	46.7	65.0
	40-50	12	20.0	20.0	85.0
	50+	9	15.0	15.0	100.0
	Total	60	100.0	100.0	

Therefore, based on the mean (4.2000), it was determined that 46.7% of the participants who took part in the study were from a mature group, i.e., they were

between the ages of 30 and 40. This was because people between those ages can engage in endeavors that help the economy of the society grow. This led to the conclusion that the researched adult brains were responsible for the correctness and dependability of the knowledge that was gathered. Also, from the table 1, the researcher found out that 1.7% of the respondents in Kisoro Municipality were aged between 10-20 years, 5.0% of the respondents were aged between 0-10 years and 20.0% were aged between 40-50 years and 15.0% were aged 50 years and above. The variance was 1.417, the mode is 4.00 and Std. Deviation was 1.19036. The median is 4.0000.

Gender of Respondents

The study investigated the gender of the respondents and the findings were as shown in the table

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GENDER OF RESPONDENTS

Frequency	Percent	Valid Percent	Cumulative Percent
Valid FEMALE	23 38.3	38.3	38.3
MALE	37 61.7	61.7	100.0
Total	60 100.0	100.0	

From table 2, it was found out that, majority of the respondents were males with 61.7%

compared to females with 38.3%.

Occupation of the respondents

Information regarding the occupation of the respondents in Kisoro Municipality, Kisoro District was collected and presented in table 3.

OCCUPATION OF RESPONDENTS

Frequency	Percent	Valid Percent	Cumulative Percent
Valid FARMER	37 61.7	61.7	61.7

TAX DRIVER	9	15.0	15.0	76.7
MOTORIST	7	11.7	11.7	88.3
TRADER	7	11.7	11.7	100.0
Total	60	100.0	100.0	

From table 3, it was found out that 11.7% of the respondents were trades, 61.7% were farmers,

11.7% were Motorists and only 15.0% of the respondents were Tax drivers.

Marital status

Information regarding the marital status of the respondents in Kisoro Municipality was collected and presented in table 4

Table 4: Marital status of respondents

MARITAL STATUS OF RESPONDENTS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SINGLE	20	33.3	33.3	33.3
	MARRIED	36	60.0	60.0	93.3
	DIVORCED	4	6.7	6.7	100.0
	Total	60	100.0	100.0	

From table 4, it was found out that, majority of the respondents were married with 60.0%,

33.3% of the respondents were single and only 6.7% had divorced.

Educational level of the respondents

Information regarding the academic background of respondents in Kisoro Municipality, Kisoro

District was obtained and tabulated as shown in table 5

Table 5: Educational background of the respondents

EDUCATION LEVEL OF RESPONDENTS

		Frequency	Percent	Valid Percent	Cumulative
Valid	PRIMARY AND BELOW	25	41.7	41.7	41.7
	O LEVEL	6	10.0	10.0	51.7
	A LEVEL	12	20.0	20.0	71.7
	CERTIFICATE	14	23.3	23.3	95.0
	NONE	3	5.0	5.0	100.0
	Total	60	100.0	100.0	

According to table 5, nearly all of the people surveyed (41.7%) had graduated from their primary schooling or less but had never gone on to further their schooling. 10.0% of the participants in the Kisoro municipality had answered their ordinary level of schooling, 20.0% had completed their more advanced levels of education, 23.3% had answered their certificates, and only 5.0% had never attended school in their lives. According to the figures, the Kisoro municipality and Kisoro District's education system is deficient and in need of improvement.

The extent of manure usage in Kisoro Municipality Northern Division, Kisoro District

This Section describes the independent variable (Manure). The independent variable was addressed in Section B of the questionnaire for respondents.

Table 6: The extent of manure usage in Municipality

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
EXTENT OF MANURE USAGE	60	3.00	1.00	4.00	4.4333	.81025
Valid N	60					

Source: SPSS Output
page

The mean (4.433) is very low indicating that farmers in Kisoro municipality hardly

use manure in their garden to a small extent. This is because the soils in Kisoro district are very fertile and this makes low need to use manure in gardens since the fertile dark brown soils can support crop growing.

The level of Crop Production in Kisoro Municipality, Kisoro District

Manure		Crop production	
Pearson	1.00		
Correlation			.705
Sig. (2-tailed)			.000
N	60		60
Pearson			
Correlation	.705		1.00
Sig. (2-tailed)	.000		
N	60		
LEVEL OF CROP PRODUCTION	Range	Minimum	Maximum
Valid N	60	1.00	3.00
			Mean
			2.6333
			Std. Deviation
			.68807

Source: SPSS Output page

The mean concerning the level of crop production in Kisoro Municipality, Kisoro District was

2.6333. The mean corresponds to code 3 of the Likert scale, indicating that people in Kisoro district practice crop production on a large scale and grow crops like irishes, beans, potatoes and yams. This is because of dark brown soils that support crop production in the area.

Relationship between Manure and Crop production

Table 8: Showing Pearson Correlation between Manure and Crop production

Correlations

*** Correlation is significant at the 0.01 level (2-tailed).*

Source: *SPSS output page*

Table 8 indicates that there is a strong positive relationship between manure and crop production at $r = 0.705$ and since the sig. value (.000) was far less than 0.01, which is the maximum level of significance required declaring a significant relationship between manure and crop production, this implies that the level of when the level of manure usage is high, the level of crop production is also high and when the level of manure usage is low, the level of crop production is also low.

Conclusion of the findings

Of the 341 farmers who provided information through interviews and questionnaires, it was discovered that at least 224 had made it clear that they applied manure for crop production, and 90 had said they relied on the fertility of their volcanic soils but only used effective field techniques like contour plowing to prevent soil erosion. The 27 recommended them to occasionally use manures or fertilizers where required, but not frequently. They also noted that there is only a very minor distinction between applying manure and not applying it. In light of the factors, it is evident that the majority of cultivators in Kisoro Municipality's Northern Division employ manure to increase crop yields.

Recommendations of the study

Smallholder farmers employed cattle dung as a significant source of essential nutrients in their crop livestock farming practices and were aware of the advantages of using fertilizers (both organic and inorganic). It was discovered that the routinely used cattle manures had comparatively low nutritional contents. Low values were ascribed to cattle feed, which might be modified to raise manure quality as well. The use of cattle dung for the cultivation of food is constrained by its difficulties in getting in big amounts, high expenses for transportation, and less automated application. To improve the quality of the manure, farmers should make an effort to collect and store it appropriately, ideally in a covered pit. Fresh cattle manure should not be applied to crops since it can cause burning.

References

- Alamu, J.F., & Rahman, S.A. (2002): Agricultural Supply Response Evidence from four cereal crops in Nigeria. The Nasarawa Journal of Humanities, 1(1), 198 - 203*
- Antholt, C.H, (1994). "Getting ready for the twenty-first century: technical change and institutional modernization in agriculture". World Bank Technical Paper #217. February.*
- Asomonye, D.E. (1991). Access and use of Selected Farm Inputs; Fertilizer, Improved Cassava cuttings and Poultry Breed by Farmers in Imo State B. Agric Tech Project, Federal University of Technology Owerri.*
- Bashaasha, B (2001). "The evolution and characteristics of farming systems in Uganda".*
- Block, S, (1994). "A new view of agricultural productivity in Sub-Saharan Africa". American Journal of Agricultural Economics, 76 August: 619-624.*
- Daramola, A. G. (1987). Quantitative Analysis of the Adoption of Improved Food Production Technology in Oyo State, Nigeria. Unpublished Ph. D. Thesis, Department*

of Agricultural Economics, University of Ibadan

Deininger, K. and Okidi, J. (1999). "Determinants of Agricultural Productivity and Nonfarm Enterprise startups. The case of Uganda". A paper presented at a conference on assessing outcomes in the context of the comprehensive Development Framework held in October 1999 at Kampala, Uganda.

FAO (2006-2007). "Review of Crop and Food Situation in Uganda". FAO. "Agricultural investment and productivity in developing countries".

Feder, G., Just, R.E. & Zilberman, D. (1985). "Adoption of agricultural innovations in developing countries: a survey". Economic Development and Cultural Change, 33: 255-298.

FFTC publication database. (1998). Food and Fertilizer technology centre Taiwan

*Microbial and
Organic Fertilizers in
Asia.*

Heisey P.W., Mwangi, W. (1996) Fertilizer use and maize production in Sub-Saharan Africa. CIMMYT Economics Working Paper 96-01. CIMMYT, Mexico, DP 222

Jayne TS, Govereh J, Wanzala M, Demeke M (2003) Fertilizer market development: a comparative analysis of Ethiopia, Kenya, and Zambia. Food Policy 28:293-316.

M. Kalim Qamar (2002). "Global trends in agricultural extension: challenges facing Asia and the

*Pacific
region"*

MFPED (2008). "National Budget Framework Paper for the Financial Years 2005/06 to 2007/08"

Ministry of Agriculture, Animal Industry and Fisheries & Statistics Dept: "National Census of

Omamo, S.W.& Mose, L.O. (2001). Fertilizer trade under market liberalization: preliminary evidence from Kenya. Food Policy 26:1-10

UBOS (1998). "Frame work for the Development of Agricultural Statistics in Uganda