
**TECHNOLOGICAL ADVANCEMENT AND ENVIRONMENTAL CONSERVATION IN KISORO
DISTRICT: A CASE STUDY OF KISORO MUNICIPALITY**

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ABSTRACT

The major objective of this study lied in finding out whether there was a relationship between technological advancement and environmental conservation in Kisoro Municipality, Kisoro district. Other objectives included; to find out the extent of environmental conservation in Kisoro Municipality and to find out the level of technological advancement in Kisoro Municipality. The study adopted a descriptive and observational research design and simple random probability sampling technique was used to obtain a sample size of 80 respondents from a target population of 45 residents in Kisoro Municipality using solvin's formula.

The investigator discovered an extremely favorable connection between technological development and conserving the environment at $r = 0.707$, and since the sig. value (.000) was far below the threshold of importance required to declare an important connection between scientific growth and conserving the environment, this suggests that the level of technological development in a region has a significant impact on the rate of ecological preservation.

The study came to the conclusion that there has been little improvement in technology, and that this is due to both low innovation and poverty. The investigator came to the additional conclusion that human activities such deforestation, bush burning, marsh restoration, and inadequate sewage disposal contributed to the district of Rukungiri's limited environmental conservation. The investigator advised the government to sufficiently educate the public on the value of environmental

preservation. The investigator also advised farmers to utilize sustainable farming practices like mulching, agriculture, and reforestation

Key words: technological advancement and environmental conservation

Background of the study

Technology progress, according to Kavanagh (2019), is the creation of knowledge or its discovery that enhances our grasp of scientific relationships or technology. According to Owen-Hill A (2017), technological development is a change in how a good or service is created or provided that lowers the number of resources needed for creation or provision.

Uganda has experienced rapid progress during the past 35 years. It has profited from advantageous natural resources and a setting with generally stable political conditions. According to Uganda's National Vision Statement, Vision 2040, the goal is to change Uganda from a rural, impoverished nation to a modern one within 30 years. The oil and gas industry, tourism, the mining industry, and the ICT industry are some of the opportunities mentioned in Vision 2040. It lists a number of factors that support expansion and growth, including a large labor pool, Uganda's central location in relation to trade, and favorable agricultural circumstances. While there is great potential for manufacturing, the proper framework circumstances are necessary. Among these include leveraging existing facilities (energy, transportation, water, oil and gas, and ICTs), and science, technology and innovation.

Statement of the problem

At the present time, environmental preservation and technological advancement are posing problems in the Kisoro District. To maintain environmentally friendly growth

and the safeguarding of the region's biodiversity, the district's pursuit of technical advancement and its effects on environmental preservation require careful consideration and action. Environmental conservation initiatives are threatened by the poor consideration of environmental factors in the adoption and application of technical breakthroughs in the Kisoro District. Rapid technological adoption can have unforeseen repercussions, including increased contamination, loss of habitat, and depletion of resources, if it is not done with sufficient ecological evaluation. The district's dedication to environmental protection is threatened by a failure to prioritize environmentally friendly methods within advancements in technology, endangering the long-term ecosystem health of the region. The district's capacity to effectively address environmental concerns is hampered by the inadequate availability and affordability of suitable technologies for environmental conservation. The district's ability to lessen environmental effects and encourage sustainable activities is hampered by a lack of knowledge, materials, and technical know-how for implementing environmentally friendly innovations. Efforts to safeguard and conserve the district's distinctive the environment, natural landscapes, and sensitive environments are further hampered by the lack of appropriate techniques. Finding out whether technological development and conservation of the environment were related in Kisoro Municipality, Kisoro District, was thus a concern.

Specific Objectives

- 1. To find out the level of Technological Advancement in Kisoro Municipality, Kisoro District*
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- 2. To find out the extent of Environmental Conservation in Kisoro Municipality.*
- 3. To find out the relationship between Technological Advancement and*

Environmental

Conservation in Kisoro Municipality, Kisoro District.

Research questions

- 1. What is the level of Technological Advancement in Kisoro Municipality?*
- 2. What is the extent of Environmental Conservation in Kisoro Municipality?*
- 3. What is the relationship between Technological Advancement and Environmental Conservation in Kisoro Municipality, Kisoro District?*

Methodology

Research design

When gathering data for the study, both qualitative and quantitative methods were used. While the use of quantitative methods allowed the investigator to build statistical models in an effort to explain what was discovered, the use of qualitative methods allowed the investigator to give a thorough, detailed explanation of the phenomenon concerning the study for in-depth data collection. Comparative analysis and statistical data gathering were also given by the method of quantification.

Study population

According to Babbie (2004), this describes the collection of components from which a sample is really chosen. A population within the study's geographical region is its target. The study's target demographic consisted of 100 people who lived in the Kisoro district's Kisoro Municipality. This was used in conjunction with Slovenes' technique for calculating sample size to create an 80-person sample group for the study. Community members, farmers, traders, the chairwoman of LC1 and a district environment officer

from the Kisoro district made up the study population.

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

A sample is a small subset of the total population (George & Mallery, 2003).

The study sample comprised of 80 respondents out of 100 of the total population where 20 respondents were farmers, 40 respondents were community members, 18 were traders, LC1 chairperson and District Environment Officer.

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

According to simple random sampling, each member of the population has an equal and independent chance of being chosen for the sample (Orodho, 2004).

Community members, farmers, dealers, the chairperson of LC1 and the district education officer were the respondents in this study. Key responders for the study were a District Environment officer and the leader of LC1. In order to choose

participants from the group of farmers, traders, and residents, a simple random selection was used. A total of 40 residents, 20 farmers, 18 traders, and 18 traders took part in the study. Their participation was chosen using simple random sampling, and special emphasis was given to including both male and female respondents in the study region.

Purposive sampling

The units in the sample that included LC1 were chosen using a purposeful sampling strategy.

a District Environment Officer and the Chair. 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 symmetry 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. In addition, there is no way to guarantee that the sample is actually accurately representing the population, therefore the investigator's ability to evaluate the population's constituent parts is given additional weight.

Data collection methods and instruments

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

District, as well as farmers and traders.

Data analysis

The statistical package for social science (SPSS) tool was used by the investigator to compute percentages, frequency, and tabulate responses, as well as to employ both quantitative and qualitative 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 statistical techniques like distribution of frequencies and percentages. The answers provided were all grouped according to their theme categories and the information they contained 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 40 questionnaires were given out, 40 were returned, thus representing 100% 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, education level and working experience of the respondents.

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 and presented in form of grouped data as shown in the table 1.

Table 1: Age of the respondents

<i>Class (Age)</i>	<i>Class mark (x)</i>	<i>frequency (f)</i>	<i>fx</i>	<i>Percentage (%)</i>
0-10 years	5	5	25	12.5
10-20years	15	10	150	25
20-30 years	25	20	500	50
30-40years	35	2	70	5
40-50years	45	3	135	7.5
TOTAL		$\Sigma f=40$	$\Sigma fx=880$	100

Source: Primary data (2022)

Because people in that age range (20 to 30 years) are still considered to be young and have plenty of energy to work, it can be inferred from the mean (22 years) that the majority of respondents who took part in the study were from a mature group, i.e., were within that range. This led to the conclusion that the researched adult brains were responsible for the correctness and dependability of the information that was gathered. Additionally, the investigator discovered from table 4.2.1 that 12.5% of the participants were between the ages of 0 and 10, 25% of participants in Kisoro Municipality, Kisoro District, were between the ages of 10 and 20, 5% of inhabitants were between the ages of 30 and 40, and 7.5% were beyond the age of 40.

Gender of Respondents

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

in the table

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Table 2: Gender of respondents

Gender	Frequency (No. of Respondents)	Percentage (%)
<i>Males</i>	15	37.5
<i>Females</i>	25	62.5
<i>TOTAL</i>	40	100

Source: Primary data
(2022)

From table 2, it was found out that, majority of the respondents were females with 62.5% compared to males with 37.5%. This shows that females produce a lot of girl children than the boy babies. The simple random sampling technique offered each member of the population an equal and non-zero chance of participation in the study.

Occupation of the respondents

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

Table 3: Occupation of respondents

Occupation	Frequency (No. of Respondents)	Percentage (%)
<i>Farmer</i>	20	50
<i>Civil servant</i>	15	37.5

<i>Trader</i>	<i>5</i>	<i>12.5</i>
<i>Total</i>	<i>40</i>	<i>100</i>

Source: Primary data (2022)

The bigger percentage of the respondents lied in farming (50%), 37.5% were civil servants and followed by traders (12.5%).

Marital status

Table 4: Marital status of respondents

<i>Marital status</i>	<i>Number of respondents (f)</i>	<i>Percentage (%)</i>
<i>Single</i>	<i>22</i>	<i>55</i>
<i>Married</i>	<i>10</i>	<i>25</i>
<i>Divorced</i>	<i>8</i>	<i>20</i>
<i>Total</i>	<i>40</i>	<i>100</i>

Source: Primary data (2022)

The major percentage of the respondents in the study was single. This was because the mean average age was 22years and people in this age range are still young to get into serious marriage and these were 22 (55%). Only 25% of the sampled population were married and 8(20%) were divorced.

Educational level of the respondents

Table 5: Educational background of the respondents

<i>Educational level</i>	<i>Number of Respondents</i>	<i>Percentage (%)</i>
<i>Primary and below</i>	5	12.5
<i>O' Level</i>	15	37.5
<i>A' Level</i>	8	20
<i>Certificate</i>	7	17.5
<i>Diploma</i>	4	10
<i>None</i>	1	2.5
TOTAL	40	100.0

According to table 5, a majority of the people who responded only graduated from their ordinary level of education (37.5%) and had never attended any higher education; 12.5% had only completed primary school; 20% were done with their A' Levels; 17.5% had finished their certificate levels; 10% had wrapped up their diploma levels; and 2.5% had never participated in any level of education. The statistics show that Kisoro District's education is deficient and urgently needed.

The level of technological advancement in Kisoro Municipality, Kisoro district

This Section describes the independent variable (Technological advancement). The independent variable was addressed in Section B of the questionnaire for respondents. Information regarding the level of technological advancement in Kisoro Municipality was tabulated in table 6 below

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
LEVEL OF TECHNOLOGICAL ADVANCEMENT	40	2.00	1.00	3.00	2.4200	.81039
Valid N	40					

Source: SPSS output page

The level of technological advancement in Kisoro Municipality was analyzed using the mean and

was 2.4200 and it is low indicating that the level of technological advancement in Kisoro district is still lagging behind and needing. The low level of technological advancement is attributed to low educational levels among the people in the area, low infrastructures and the high rates of poverty in the area.

The extent of environmental conservation in Kisoro Municipality

This Section describes the dependent variable (Environmental conservation). The independent variable was addressed in Section C of the questionnaire for respondents.

Table 7: The extent of environmental conservation

<i>Descriptive Statistics</i>						
	<i>N</i>	<i>Range</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
EXTENT OF ENVIRONMENTAL CONSERVATION	40	2.00	1.00	3.00	1.7000	.78895
<i>Valid N</i>	40					

Source: SPSS output page

The extent of environmental conservation in Kisoro Municipality was analyzed using the mean

and was 1.7000 and is very low, indicating that the natives in Kisoro District destroy the environment and practice activities like bush burning, farming, swamp reclamation, deforestation and many other activities which degrade the environment.

Table 8: Human activities that destroy the environment

<i>Human activity</i>	<i>No. of respondents</i>	<i>Percentage (%)</i>
<i>Bush burning</i>	5	12.5
<i>Over grazing</i>	8	20
<i>Over cultivation</i>	7	17.5
<i>Deforestation</i>	20	50
<i>Total</i>	40	100

Source: Primary data (2022)

According to table 8, more than half of the inhabitants of Kisoro Municipality deforest their surroundings (50%), which harms the ecosystem. 17.5% of those who responded

excessively cultivate their land, which is detrimental to soil fertility and soil structure because the majority of people in this region are farmers and there is a limited amount of land available for farming. 20% of the respondents say they degrade the ecosystem through overgrazing, and 12.5% say they do it by burning the fertile lands in the bush.

Table 9: Components of environment that are destroyed in Kisoro Municipality

<i>Component</i>	<i>No. of respondents</i>	<i>Percentage (%)</i>
<i>Atmosphere</i>	<i>25</i>	<i>62.5</i>
<i>Hydrosphere</i>	<i>10</i>	<i>25.0</i>
<i>Lithosphere</i>	<i>5</i>	<i>12.5</i>
<i>Total</i>	<i>40</i>	<i>100</i>

Source: Primary data (2022)

From table 9, it was found out that majority of the residents in Kisoro Municipality destroy the atmosphere (62.5%), 25% destroy the hydrosphere and only 12.5% destroy the lithosphere.

Relationship between technological advancement and environmental conservation

Table 9: Showing Pearson Correlation between technological advancement and environmental conservation

Correlations

		Technological Advancement	Environmental Conservation
Technological Advancement	Pearson Correlation	1.00	.707
	Sig. (2-tailed)		.000
	N	40	40
Environmental Conservation	Pearson Correlation	.707	1.00
	Sig. (2-tailed)	.000	
	N	40	40

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

Source: SPSS output page

Table 9 indicates that there is a very strong positive relationship between technological

advancement and environmental conservation at $r = 0.707$ 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 technological advancement and environmental conservation, this implies that the level of technological advancement in an area greatly influences the level of rate of environmental conservation.

Conclusion of the findings

The researcher concluded that the level of technological advancement is low and this was because of low innovations in the area and lack of financial support.

researcher concluded that there is a very strong positive correlation between technological advancement and environmental

conservation in Kisoro district. This was because the level of technological advancement in the area greatly influences the extent of environmental conservation.

Recommendations of the study

The researcher recommended the government to carry out enough sensitization of people about the importance of environmental conservation.

The researcher also recommended farmers to use good methods of farming like afforestation, agro- forestry and mulching.

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