
**POLLUTION AND ORGANISMS' EXTINCTION 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 Pollution and Organisms Extinction in Kisoro Municipality, Kisoro District. Other objectives included: To establish the level of Pollution in Kisoro Municipality, Kisoro District and to find out the extent of Organisms Extinction in Kisoro Municipality, Kisoro District.

Using Solvin's method, eighty participants from the Kisoro Municipality and Kisoro District were chosen for the size of the sample being studied. The study utilized a descriptive and observational research design. Microsoft Excel was used to analyze the data, and graphs, distributions of frequencies tables, and pie charts were used to illustrate the results. The study's data were analyzed using SPSS software. According to the results, there was an extremely favorable correlation between pollution and the disappearance of organisms ($r = 0.994$), and since the sig. value (.000) was much lower than the threshold level of importance required to declare a significant connection between pollution and extermination of organisms (0.01), this meant that pollution had a substantial effect on extinction of organisms. Since the P-value (0.00) was less than 0.05, this was statistically noteworthy. As a result, we reject the idea of a null hypothesis and come to the conclusion that there was no connection between contamination and organism extinction in the Kisoro Municipality. These pollutants disrupt the life cycles of living things, such as earthworms as there and they also kill, mutate, and produce adaptive electromagnetic radiation in some

species, which leads to the extinction of the parent species. The researcher advised the government to establish well-guarded wildlife zones (game parks) in order to protect and preserve these species of plants and animals.

Key words: *pollution and organisms' extinction*

Background of the study

Pollution is the process of introducing a chemical that has negative or hazardous effects into the natural environment. According to Kauck (D, 1997), pollution is the term used to describe how the environment changes as a result of the natural or intentional introduction of dangerous pollutants. These contaminants may create ecosystem instability, difficulties, or negative effects. Furthermore, according to Hamilton (1984), pollution is anything that is brought into the environment that is filthy, unclean, or that has a negative impact. According to Butynski & Kalina, J. (1993), pollution is the process of adding any substance or type of energy to the atmosphere at a pace quicker than it can be distributed or stored in an innocuous form.

To address problems relating to air pollution in southern Africa, the Air Pollution Information Network for Africa (APINA) was established. A network of researchers, policymakers, businesses, and non-governmental organizations (NGOs) make up this organization. For the implementation of what is known as the Male Declaration, a comparable network exists throughout Asia. These networks are a part of the Regional Air Pollution in Developing Countries (RAPIDC) program, which is sponsored by the Swedish International Development Cooperation Agency (Sida) and is directed by Stockholm Environmental Institute (SEI).

Similar to the rest of the African continent, Southern Africa has made significant progress in the areas of commercialization, urbanization, and financial growth

overall as it transitioned from a rural to a complex civilization. Environmental issues that were essentially nonexistent at the turn of the 20th century have emerged as a result of economic growth and increasing numbers of people. One of the parts of Africa that is developing the quickest is Southern Africa. Energy is a necessity for economic growth, and in the Southern African Development Community (SADC) nations, coal and fuel wood are the main energy sources. The state of air pollution in southern Africa was revealed in country studies on the situation in seven southern African nations (Botswana, Malawi, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe) that APINA organized in 2002.

Statement of the problem

The problem lied in finding out whether there was a relationship between Pollution and Organisms

Extinction in Kisoro Municipality, Kisoro District.

Specific objectives

- 1. To establish the level of Pollution in Kisoro Municipality, Kisoro District.*
- 2. To find out the extent of Organisms Extinction in Kisoro Municipality, Kisoro District.*
- 3. To find out the relationship between Pollution and Organisms Extinction in Kisoro Municipality, Kisoro District.*

Research questions

- 1. What is the level of Pollution in Kisoro Municipality, Kisoro District?*
- 2. What is the extent of Organisms Extinction in Kisoro Municipality,*

Kisoro District?

3. *What is the relationship between Pollution and Organisms Extinction in Kisoro Municipality, Kisoro District?*

Methodology

Research design

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

Study population

This was correlated with Slovenes formula of sample size determination to obtain a sample population of 80 respondents for this study.

The investigator conducted a pilot study/pre-study using Biology and ICT students from Metropolitan International University and then the supervisor (Dr. Arinaitwe Julius) himself to check the questionnaires' content, framework, sequence, meaning, and inconsistency of the inquiries. This was done to ensure the accuracy and validity of the questionnaires that the investigator used as a guide for the interviews. After the questions are created, a tenth of the community members in the sample are used for pre-testing. This made it easier to find the instrumentation' ambiguities and re-align them with the goals. The community members, the chairwoman of LC 5, and an environmental officer from the Kisoro municipality were included in the research 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 were used to select respondents in the study.

Sampling procedures

A sampling procedure is the process of selecting a subset of a population to test a population-wide hypothesis (Jowin, 2003). The methods utilized to choose study participants were simple random selection and selective sampling.

Samples taken

(George & Mallery, 2003) A sample is a relatively tiny portion of the entire population.

Out of the total number of 100 individuals who participated, 80 made up the study sample; 40 of them were members of the community, and 38 were farmers, the LC 5 Chairman, and the district conservation 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

The respondents in this study were farmers, community members, LC5 Chairperson and district environment officer. The LC5 Chairperson and a district environment officer were used as key respondents in the study. Simple random sampling was used to select respondents in the group of farmers and community members. A total of 38 farmers and 40 community members 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

Units were chosen for the sample using a deliberate sampling procedure, including LC 5. Kisoro District Chairperson and District Environment Officer. This method is founded on the study's goal and the 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 representative of the population, thus the ability of the investigator to evaluate the components of the sample is given additional weight.

Data collection methods and instruments

According to Syed Muhammad Sajjad Kabir (2016), the gathering of data is the process of acquiring data and measuring data pertaining to relevant variables in a predetermined systematic way that allows one to respond to specified inquiries, investigate hypotheses, and assess results. The investigator 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 employed to gather information from all farmers and residents of the Kisoro Municipality and Kisoro area.

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 frequency distributions and percentages. The answers were all grouped according to their theme categories and the information they contained were evaluated for quantitative information 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 80 questionnaires were given out, 50 were returned, thus representing 65% response. The study was considered good because according to Peil (1995), questionnaire return rate above 50% is considered good for a study.

Interview response

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

Statistics
AGE OF RESPONDENTS

N	Valid	50
	Missing	0
Mean		3.7000
Median		4.0000
Std. Deviation		1.38873
Range		5.00

AGE OF RESPONDENTS

Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0-10	8 16.0	16.0	16.0
10-20	1 2.0	2.0	18.0
20-30	3 6.0	6.0	24.0
30-40	27 54.0	54.0	78.0
40-50	8 16.0	16.0	94.0
50+	3 6.0	6.0	100.0
Total	50 100.0	100.0	

Therefore, based on the mean (3.7000), it was determined that 54.0% of the participants who took part in the study belonged to a reach maturity. group, meaning they were between the ages of 30 and 40. This was since individuals in that age range have the mental capacity to engage in activities that can seriously harm organisms. This led to the conclusion that the researched adult brains were responsible for the correctness and dependability of the information that was gathered. Also, from the table 1, the researcher found out that 2.0% of the respondents in Kisoro Municipality were aged between 10-20years, 6.0% of the respondents were aged between 20-30 years and 16.0% were aged between 40-50 years and 6.0% were aged 50 years and above. The range was 5.00 and Std. Deviation was 1.38873. 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

2. The following information regarding the gender of the respondents was analyzed using SPSS Software and presented in form of grouped data as shown in the table 2

GENDER OF RESPONDENTS

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	MALE	33	66.0	66.0
	FEMALE	17	34.0	100.0
	Total	50	100.0	

From table 2, it was found out that, majority of the respondents were males with 66.0%

compared to females with 34.0%.

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	26	52.0	52.0	52.0
	CIVIL SERVANT	11	22.0	22.0	74.0
	WILDLIFE OFFICER	6	12.0	12.0	86.0
	INDUSTRIAL WORKER	7	14.0	14.0	100.0
	Total	50	100.0	100.0	

From table 3, it was found out that 52.0% of the respondents were farmers, 22.0% were civil servants, 12.0 were wildlife officers and only 14.0% of the respondents in Kisoro municipality were industrial workers.

Marital status

Information regarding the marital status of the respondents in Kisoro District 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	16	32.0	32.0	32.0
	MARRIED	25	50.0	50.0	82.0
	DIVORCED	9	18.0	18.0	100.0
	Total	50	100.0	100.0	

From table 4, it was found out that, majority of the respondents were married with 50.0%,

32.0% of the respondents were single and only 18.0% 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 Percent
Valid	Primary and below	27	54.0	54.0	54.0
	O level	10	20.0	20.0	74.0
	Certificate	4	8.0	8.0	82.0
	Diploma	6	12.0	12.0	94.0
	None	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

When the survey and interview responses were analyzed, it was revealed from table 5 that the majority of those who participated (54.0%) had only completed the primary level of schooling and had never pursued additional schooling, while 20.0% had completed the ordinary level, 8.0% had accomplished their certificate level of schooling, 12.0% had accomplished their diploma level of learning, and 6.0% never completed any level of schooling during their lives. According to the statistics, Kisoro Municipality and Kisoro District's education system is deficient and in need of improvement.

The level of implementation of Christian Rituals among youths in Kisoro Municipality

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

Table 6: The level of Pollution

Statistics		
LEVEL OF POLLUTION IN KISORO MUNICIPALITY		
N	Valid	50
	Missing	0

LEVEL OF POLLUTION IN KISORO MUNICIPALITY

Frequency		Percent		Valid Percent	Cumulative Percent
Valid	LOW	6	12.0	12.0	12.0
	MEDIUM	8	16.0	16.0	28.0
	HIGH	36	72.0	72.0	100.0
	Total	50	100.0	100.0	

The responses were interpreted as follows, 12.0% of the respondents agreed that the Level of pollution in Kisoro Municipality is low, 72.0% argued that Level of

pollution in Kisoro Municipality is high, 16.0% revealed that Level of pollution in Kisoro Municipality is Medium. Also under this study objective, the respondents were asked some of the pollutants and most revealed that sewage, plastics, noise, smoke and polythene papers are the major pollutants in Kisoro Municipality.

Table 7: Types of pollution in Kisoro municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Air Pollution	25	50.0	50.0	50.0
	Water Pollution	12	24.0	24.0	74.0
	Soil Pollution	13	26.0	26.0	100.0
	Total	50	100.0	100.0	

From table 7, it was found out that the major type of pollution experienced by people in Kisoro

Municipality is air pollution with 50.0%, water pollution had 24.0% and soil pollution contributed

26.0.

The findings were in line with the study conducted by WHO (2006) where it was found that Car emissions, chemicals from factories, dust, and pollen and mold spores may be suspended as particles. Ozone, a gas, is a major part of air pollution in cities. When ozone forms air pollution, it's also called smog. Some air pollutants are poisonous

Under this second objective, the researcher went ahead to ask respondents using the 5 style Likert scale and the responses were analyzed using SPSS and presented in table 8 below.

Statistics

Human Activities are the major causes of pollution

N	Valid	50
	Missing	0

Human Activities are the major causes of pollution

		Frequency	Percent	Valid Percent	Cumulative
Valid	STRONGLY DISAGREE	6	12.0	12.0	12.0
	DISAGREE	6	12.0	12.0	24.0
	NEITHER AGREE NOR DISAGREE	1	2.0	2.0	26.0
	AGREE	12	24.0	24.0	50.0
	STRONGLY AGREE	25	50.0	50.0	100.0
	Total	50	100.0	100.0	

From the table 8, it was found out that 12.0% of the respondents strongly disagreed that human activities are the major causes of pollution in this Kisoro Municipality, 12.0% disagreed, 2.0% neither agreed nor disagreed, 24.0% agreed and 50.0% strongly agreed that human activities are the major causes of pollution in Kisoro Municipality, Kisoro District.

The extent of Organisms Extinction in Kisoro Municipality

This Section describes the dependent variable (Organisms Extinction). The dependent variable was addressed in Section C of the questionnaire for respondents. Information regarding the extent of Organisms Extinction in Kisoro Municipality was collected from respondents and analyzed using SPSS Software and the results were presented and tabulated in table 9 below.

EXTENT OF ORGANISMS EXTINCTION IN KISORO MUNICIPALITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	6	12.0	12.0	12.0
	Medium	12	24.0	24.0	36.0
	Large	32	64.0	64.0	100.0
	Total	50	100.0	100.0	

As a result of the high levels of contamination in Kisoro Municipality, which 64.0% of the study's participants thought is the reason of the organisms' extermination there, the magnitude of this loss of life in that municipality was determined to be considerable. Only 24.0% of the people who responded said that the level of organism extermination in Kisoro Municipality, Kisoro District, is at a medium extent, while 12.0% concurred that it is at a small extent. When questioned about human behaviors that harm living things, the respondents named bush burning and the direct discharge of untreated sewage into the natural world as examples.

Relationship between Pollution and Organisms Extinction in Kisoro Municipality

Table 9: Showing Pearson Correlation between Pollution and Organisms Extinction

Correlations			
Pollution	Pearson Correlation	1.00	.994
	Sig. (2-tailed)		.000
	N	50	50
Organisms Extinction	Pearson Correlation	.994	1.00
	Sig. (2-tailed)	.000	
	N	50	50

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

Source: SPSS output page

At $r = 0.994$, Table 9 shows an extremely strong positive connection between contamination and the extinction of living things. Because the sig. value (.000) was

much lower than the threshold level of significance of 0.01, which is required to declare a statistically significant connection between pollution and extinction of organisms, this suggests that pollution has a significant impact on extinction of organisms.

Since the P-value (0.00) is less than 0.05, this was of statistical significance. As a result, we reject the null hypothesis and come to the conclusion that there really is no connection between contamination and organism extermination in the Kisoro Municipality.

Conclusion of the findings

The investigator came to the conclusion regarding this objective through what she discovered that Kisoro Municipality has a high level of pollution, which is caused by contaminants including sewage, plastics, noise, smoke, and polyethylene papers that are present there.

Pollution and the eventual extinction of organisms have a strong positive link. The investigator came to the conclusion that a lot of human endeavors are carried out in this region, such as bush burning and forest clearing, which result in ecological contamination and eventually the extinction of biological species. These contaminants disrupt the life cycles of living things, such as earthworms, and they also kill, mutate, and produce adaptive electromagnetic radiation in some species, which leads to the annihilation of the parent species.

Recommendations of the study

The researcher recommended the government to set up well guarded wildlife zones (Game parks)

so that these species like plants and animals can be protected and conserved.

The researcher recommends the Uganda Wildlife Authority to always protect the

game reserves strictly so that the animals and plants are protected for future generations.

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