
**BUSH BURNING AND ECOSYSTEM CONSERVATION IN KISORO DISTRICT: A CASE STUDY
OF NYAKABANDE SUB-COUNTY**

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ABSTRACT

The major objective of this study lied in finding out whether there was a relationship between bush burning and ecosystem conservation in Nyakabande sub-county, Kisoro District. Other objectives included: To ascertain the extent of bush burning in Nyakabande sub-county, Kisoro District and to find out the level of ecosystem conservation in Nyakabande sub-county, Kisoro District.

To achieve a sample size of eighty participants from Nyakabande Sub-County using Solvin's formula, the study used a basic random chance sampling technique using a descriptive and observational research design. According to the research, there was a 0.806 link between ecosystem preservation and avoiding bushfires. We came to the conclusion that there was a positive association between ecosystem protection and bush fire since the correlation coefficient was positive. This indicated that there was an opportunity for environmental preservation to grow along with an increase in the frequency or severity of bush burning. The possibility of finding the correlation coefficient by chance is indicated by the significance level, "Sig. (2-tailed)," which is displayed. In this case, the significance level was 0.000, which was less than the conventional threshold of 0.05. This demonstrated that the relationship between ecosystem preservation and bush fire was statistically significant at the 0.05 level. The null hypothesis, according to which there was no association between the two variables, was thus rejected.

The investigator advised the government to give NEMA enough resources so that it can

oversee all wooded areas across the nation by enforcing stringent rules to safeguard trees from bush burning for future generations. To preserve ecosystems and the environment, the investigator advises farmers to use good farming practices including agroforestry and reforestation. The farmers are also recommended to use electricity and biogas as forms of fuel energy for cooking and avoid using fire woods as fuel.

Key words: *bush burning and ecosystem conservation*

Background of the study

Bush burning, according to Godwin Luba (2017), is the act of igniting trees, weeds, and grasses in unused fields. The chemical reaction that occurs between oxygen and fuel that is heated to ignition temperature is how Bruce (1996) defined the term "bush burning."

Hardesty et al. (2005) divided the world's ecosystems into three categories: fire-independent, fire-sensitive, and fire-dependent. Since the climate (too dry, too wet, or too cold) forbids it or because there isn't enough biomass to support a fire, fire never or seldom ever occurs in environments that are combustion-independent. Fire damages fire-sensitive habitats by upsetting ecological processes, killing a lot of people, or even eradicating species that have not evolved in these environments due to this selective force. Species are fire adapted, explosive, and blaze-maintained, and fires are frequent in wildfire-dependent ecosystems, which evolved in the context of periodic or episodic fires and rely on them for sustaining their biological processes (Napstad et al. 2001).

Anwadike's 2003 study in Nigeria revealed that species prosperity, variation, and transportation, particularly in the tropical and subtropical regions, are experiencing notable declines as a result of climate change, increased economic growth, overexploitation of natural resources, and perhaps social apathy towards biological conservation measures. Given how important biodiversity is to people's socioeconomic well-being, its importance cannot be overstated. In order to prevent the impending

extinction of species and ecosystems, several nations around the world, including Nigeria, have started to demonstrate a strong preference for conservation techniques.

Statement of the problem

In Kisoro District, Uganda, bush burning—also known as controlled or purposeful fires started to clear vegetation—is a common practice. Bush burning may be advantageous for some agricultural techniques in the near term, but it causes serious problems for the preservation of the region's ecosystems.

The uncontrolled and overbearing practice of bush burning in Kisoro District has a negative impact on the local environment and is endangering its long-term sustainability by reducing the environment, degrading the soil, increasing the risk of wildfires, and upsetting the balance of the environment. In Kisoro District, frequent and severe bushfires threaten several plant and animal species and destroy ecosystems. Native plants and animals are unable to grow back or survive, which reduces complexity and may result in the loss of endangered or endemic species. Bush burning exposes the land to wind and water erosion by removing the barrier of plants. Topsoil, which is rich in nutrients and essential for agricultural output, is lost as a result. The livelihoods of local farmers are negatively impacted by soil deterioration, which lowers the yield of crops. Consequently, the issue was determining whether there was a connection between protecting the environment and the burning of trees in Nyakabande sub-county, Kisoro District.

Specific Objectives

1. *To ascertain the extent of bush burning in Nyakabande sub-county, Kisoro District.*
2. *To find out the level of ecosystem conservation in Nyakabande sub-county, Kisoro District.*
3. *To find out the relationship between bush burning and ecosystem conservation in Nyakabande sub-county, Kisoro District.*

Research questions

1. *What is the extent of bush burning in Nyakabande sub-county, Kisoro District?*
2. *What is the level of ecosystem conservation in Nyakabande sub-county, Kisoro District?*
3. *What is the relationship between bush burning and ecosystem conservation in Nyakabande sub-county, Kisoro District?*

Methodology

Research design

The study used a design that was descriptive in nature and was used to explain what was present in relation to the variables or circumstances in a situation and to learn more about the current status of the phenomenon (Anastas and 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.

Observational research designs, which may be direct or indirect, draw conclusions by contrasting participants with a control group and offer helpful insights into a phenomenon (Rosenbaum & Paul R., 2010). The investigator used both direct and

indirect qualitative study designs, focusing in particular on determining the degree of bush burning in Nyakabande sub-county and the connection between bush burning and ecosystem.

Study population

Study population as defined by Babbie, (2004) is aggregation of elements from which sample is actually selected. The study targets a population with in the research geographical area. The study population included farmers, civil servants and traders.

Statistics

Valid	50
Missing	0

STUDY POPULATION

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Farmer	28	56.0	56.0	56.0
Civil servant	12	24.0	24.0	80.0
Trader	10	20.0	20.0	100.0
Total	50	100.0	100.0	

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

An accessible population of approximately 80 Kisoro Municipality inhabitants served as the sample size for the study, which included responses from 74 respondents. Using the predefined specifications on sample size by Krejcie Robert, V., and Morgan Daryle, W.

(1970), the sample was calculated at a confidence level of 0.05. Only 36 residents, 28 farmers, and 10 employees of the Nyakabande Sub-County Headquarters in the Kisoro District made up the sample population.

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 community members, civil servants and the farmers, while, 10 staff members from Nyakabande Sub- County Headquarters were the key informants. Simple random sampling was used to select respondents in the group of community members and farmers.

36 community members, 28 farmers 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

Staff from the Nyakabande Sub-County Headquarters were chosen for the sample using a purposeful sampling strategy. This method is founded on the study's goal and the distinctive features of a population. This strategy was employed by the investigator because it is particularly helpful in circumstances when you must swiftly reach a specified sample and where sampling for symmetry is not the primary objective.

Only those people who are pertinent to the research design are chosen by objectives

sampling, which is somewhat 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 ability of the investigator 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 analyzing information on relevant variables in a predetermined systematic way that allows one to respond to specified research inquiries, investigate hypotheses, and assess results. The researcher employed both secondary and primary data methods to gather both qualitative and quantitative data. In order to gather data, various techniques including questionnaires, interviews, and observations were used. The two main techniques for gathering data were surveys and interviewing protocols. In Nyakabande sub-county, Kisoro district, these were utilized to collect data from all farmers and residents.

Data analysis

The statistical package for social science (SPSS) tool was used by the investigator to compute proportions, frequency, and tabulate replies, 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 distribution and proportions. By categorizing and analyzing all of the responses received in accordance with their subject regions, content analysis was used to examine qualitative data. There will be tables, figures, and charts used in the slides. Microsoft Excel and the Statistical Package for Social Sciences (SPSS) program were utilized for assistance in the study of data

RESULTS

Response rate

Questionnaire return rate

All the 74 questionnaires were given out, 50 were returned, thus representing 68% 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

Table 1: Age of the respondents

Statistics

N	Valid	50
	Missing	0
Mean		4.2600
Median		5.0000
Std. Deviation		1.48200
Range		5.00

AGE OF RESPONDENTS

Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0-10	4	8.0	8.0
10-20	4	8.0	16.0
20-30	3	6.0	22.0
30-40	13	26.0	48.0
40-50	16	32.0	80.0
50+	10	20.0	100.0
Total	50	100.0	

Because individuals within the same age bracket have a lot of energy to work and engage in farming activities that motivate bush combustion, it can be inferred from the mean (4.2600) that the majority of the participants who took part in the study were from a mature group, i.e., were between the ages of 40 and 50. 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 8.0% of the respondents were aged between 0-10 years, 8.0% of the respondents in Kisoro Municipality were aged between

10-20years, 26.0% of the respondents were aged between 30-40years and 6.0% were aged between

20-30years and 20.0% were aged 50 years and above. The range was 5.00 and Std.

Gender of Respondents

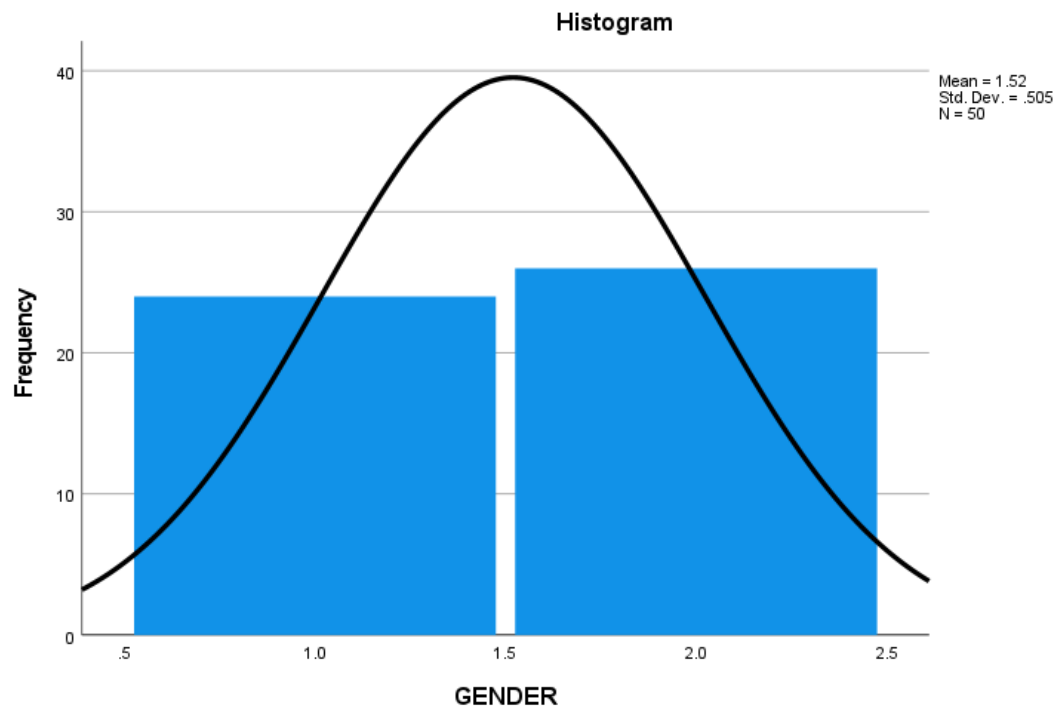
The study investigated the gender of the respondents and the findings were as shown in the table 2

Table 2: Gender of respondents

		Valid Percent	
Valid	Male	2448.0	48.0
	Female	2652.0	52.0
	Total	50100.0	100.0

From table 2, it was found out that, majority of the respondents were females with 52.0%

compared to males with 48.0%.



Occupation of the respondents

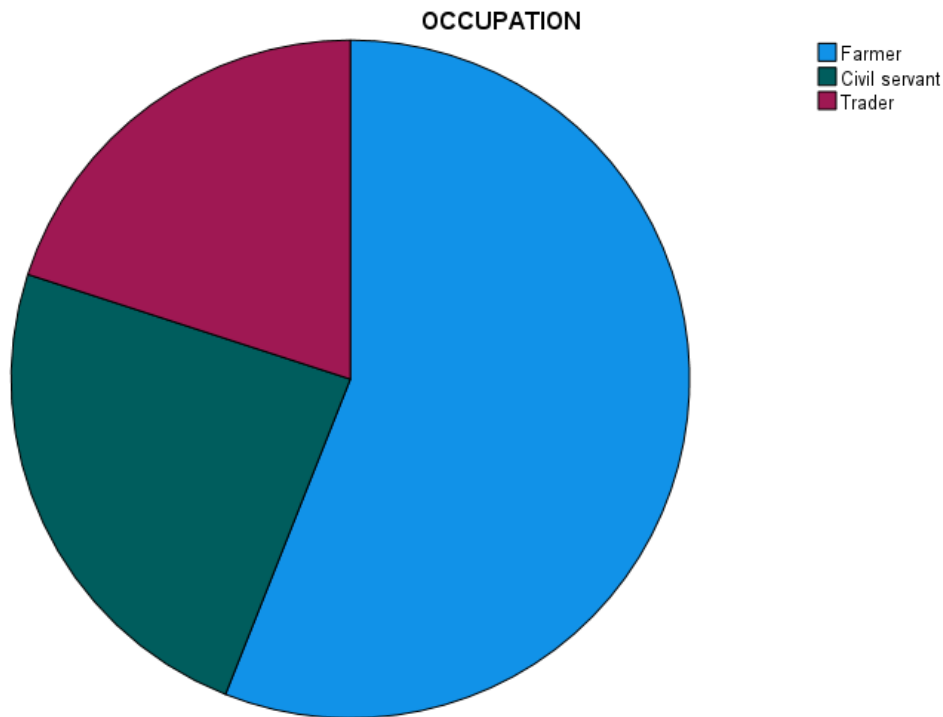
Information regarding the occupation of the respondents in Kisoro District was collected and presented in table 3

Table 3: Occupation of respondents

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Farmer</i>	28	56.0	56.0	56.0
	<i>Civil servant</i>	12	24.0	24.0	80.0
	<i>Trader</i>	10	20.0	20.0	100.0
	<i>Total</i>	50	100.0	100.0	

The bigger percentage of the respondents lied in farming (56.0%), 24.0 were Civil

Servants and followed by Traders (20.0%).



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

Frequency			Valid Percent	Cumulative Percent
Valid	Single	1020.0	20.0	20.0
	Married	2958.0	58.0	78.0
	Divorce	1122.0	22.0	100.0
	Total	50100.0	100.0	

From table 4, it was found out that, majority of the respondents were married with 58.0%, 20.0% of the respondents were singles and only 22.0% had divorced.

Educational level of the respondents

Information regarding the academic background of respondents in Nyakabande Sub- County, Kisoro District was obtained and tabulated as shown in table 4.2.5

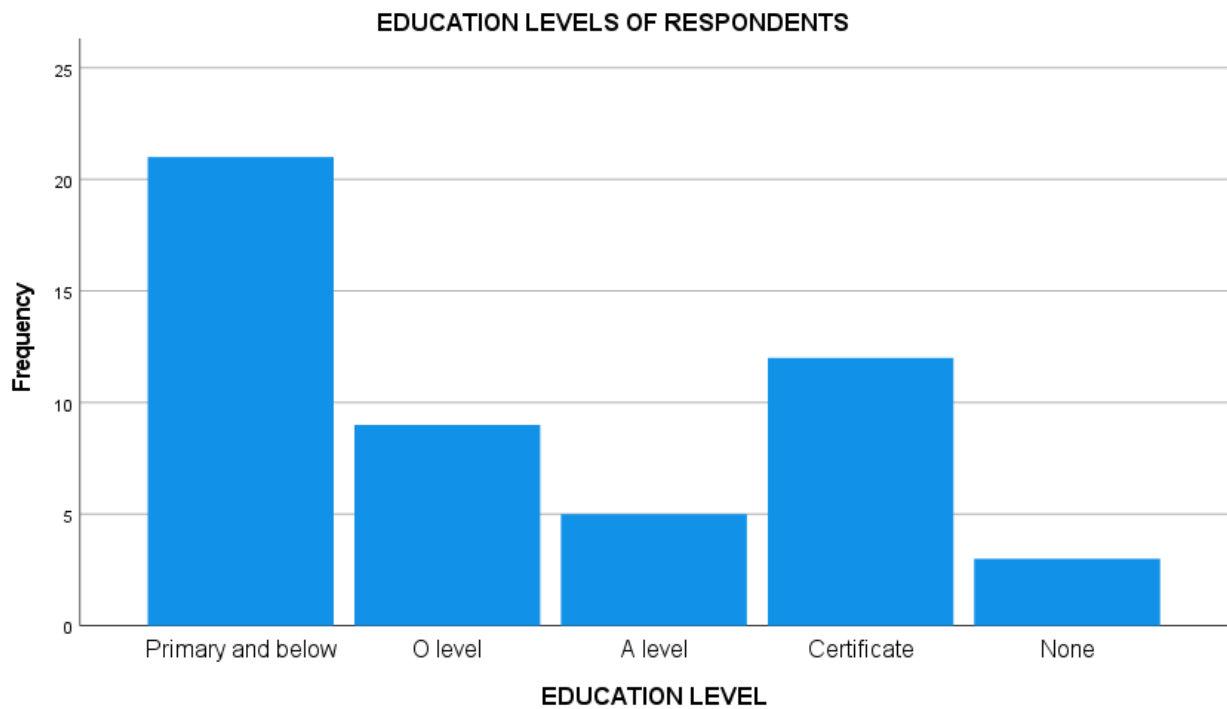
Table 5: Educational background of the respondents

EDUCATION LEVEL				
			Valid Percent	
Valid	Primary and below	21	42.0	42.0
	O level	9	18.0	60.0
	A level	5	10.0	70.0
	Certificate	12	24.0	94.0
	None	3	6.0	100.0
	Total	50	100.0	

From table 5, it was found out in an analysis of interviews and questionnaire that majority of the respondents had only completed their primary level of education (42.0%) and never continued with their further studies, 18.0% had completed O level of education, 10.0% had completed them

A' Level of education, 24.0% had finished their certificate level of education and 6.0% had not attended any level of education in their lives. From the statistics, it's indicating that the education of Nyakabande Sub- County, Kisoro District is lacking and

needing.



The extent of Bush Burning in Nyakabande Sub- County

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

Table 6: The extent of Bush Burning

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	High	2958.0	58.0	58.0
	Medium	1530.0	30.0	88.0

<i>Small</i>	612.0	12.0	100.0
<i>Total</i>	50100.0	100.0	

Because 58.0% of the participants in the study's total population acknowledged that bush burning is practiced to a significant amount, it was determined that Nyakabande sub-county had a high level of bush burning. 30% concurred

the degree of bush fire is at a modest level, whereas only 12.0% indicated that it is at a medium extent. The majority of the participants who were questioned about the causes of bush burning for this study purpose stated that they do it to obtain land for habitation and agriculture. Participants were questioned on the effects of bush burning, and the results showed that bush burning causes soil erosion, reduces rainfall, kills soil living creatures, and degrades the soil structure.

The Level of Ecosystem Conservation in Nyakabande Sub- County

This Section describes the dependent variable (Ecosystem Conservation). The dependent variable was addressed in Section C of the questionnaire for respondents. Information regarding the level of ecosystem conservation in Kisoro district was tabulated in table 7 below.

Table 7: Level of Ecosystem Conservation

<i>Frequency</i>		<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>High</i>	1326.0	26.0	26.0
	<i>Medium</i>	1020.0	20.0	46.0
	<i>Low</i>	2754.0	54.0	100.0

Total	50	100.0	100.0
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Following the interpretation of the results, 54.0% of the participants agreed that the Level of the preservation of ecosystems in Nyakabande sub-county is low, 20.0% said that it is intermediate or medium, and 26.0% said that it is high.

For instance, a study for the United Nations Principles for Responsible Investment (UNPRI) estimated that 3,000 listed companies worldwide were accountable for environmental externalities, or third-party costs, or "social costs," containing to more than US\$ 2 trillion in Net Present Value terms (based on 2008 data), or about 7% of their total earnings and up to a third of their together profits (B2).

Relationship between Bush burning and Ecosystem Conservation in Nyakabande sub- county

The data collected from the respondents on the relationship between Bush burning and Ecosystem

Conservation in Nyakabande sub-county, Kisoro district were presented as seen from table 8

Table 8: The relationship between Bush burning and Ecosystem Conservation

		Bush burning	Ecosystem Conservation
Bush burning	Pearson Correlation	1	.806**
	Sig. (2-tailed)		.000
	N	49	49
Ecosystem Conservation	Pearson Correlation	.806**	1
	Sig. (2-tailed)	.000	

	N	49	49
**. Correlation is significant at the 0.05 level (2-tailed).			

Looking at the table, we can see that the correlation coefficient between bush burning and ecosystem conservation is 0.806. We can infer that bush burning and conservation of ecosystems are positively correlated because the correlation coefficient is positive. This indicates that there is a tendency for ecosystem conservation to rise when the frequency or magnitude of bush burning increases.

The statistical significance level, denoted by "Sig. (2-tailed)," displays the likelihood that the relationship coefficient was discovered by chance. The significance level in this instance is 0.000, which is lower than the usual cutoff of 0.05. This shows that the relationship between preventing ecological destruction and bushfires is of statistical importance at the 0.05 level. So, the null assumption that there is no connection between the two variables in question can be rejected.

Conclusion of the findings

The investigator came to the conclusion regarding this objective from the data that there is a lot of burning of bush and that this is due to a number of variables, including the strong demand for land for cattle breeding, development, development of roads, and farming.

Burning of vegetation and ecosystem preservation have a strong beneficial association. The researcher came to the conclusion that the high level of bush burning observed in the study area increased the rate at which living species are being wiped out and interrupted the delicate balance of relationships within the natural environment, which led to degradation of ecosystems since little is being done to preserve the ecological diversity of the environment for generations to come.

Recommendations of the study

The researcher recommended the government to provide enough support to NEMA in

order to carry out the supervision of forested area all over the country by enforcing strict laws to protect forests for future generations against bush burning.

The researcher recommends the farmers to practice good farming methods like agro-forestry and afforestation to conserve the ecosystems and environment. The farmers are also recommended to use electricity and biogas as forms of fuel energy for cooking and avoid using fire woods as fuel.

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