

Deforestation And Climate Changes In Kisoro District: A Case Study Of Nyundo Sub-County

Sunday Sypiriano¹, Zigira Sam²

1, 2 Metropolitan International University

Abstract

The study aimed at deforestation and its impact on climate changes in Kisoro district with a case study of Nyundo sub-county and it was guided by the following objectives; To find out the level of deforestation in Nyundo sub county in Kisoro district, to find out extent of climate changes in Nyundo sub county in Kisoro district and to find out the relationship between deforestation and climate change in Nyundo Sub County in Kisoro district. The researcher employed a descriptive survey research design that helped in gathering information where little knowledge is known. The researcher employed both quantitative and qualitative research paradigms in data analysis for purposes of methodological triangulation in-order to enhance the validity and reliability of the study findings. From the findings, the researcher found out that the leading effect of deforestation on climate change is Un expected heavy rainfall by 47.2%, followed by pro-longed drought with 29.1%, floods by 15.2%, and loss of biodiversity by 8.3%. The research also recommends that mass sensitization of people about the importance of natural resources, putting strict laws against human activities, encouraging re- afforestation and afforestation, and electricity extension to rural areas as possible measures that can be undertaken to reduce deforestation causing climate change.

Keywords: Deforestation And Climate Changes

Background of the Study

Deforestation is among the world's leading causes of Climate changes where it accounts for over 50% (Nicholas et al., 2023). The most affected continents are Australia, Africa and South America. In Australia over 70% of the natural forests have been cut for agriculture, in Africa over 60% have been cut mainly for fuel and agriculture while in South America they have been cut mainly for timber, agriculture and fuel (Allan et al., 2023). According to Mubiru, et al (2004), in South America over 40% the Amazon forest has been cut in search for arable land and timber for different uses at domestic and industrial levels. Though the governments concerned are trying their level best to combat the problem, they lack enough work force to patrol the whole forest (Winny et al., 2023).

Butler, (2006) discussed deforestation in three East African countries, namely; Uganda, Rwanda and Burundi. In Bunmudi, rates of forest clearing have risen by almost 48 percent since the close of the 1990s. In total, Burundi lost 137,000 hectares (47%) of its forest cover between 1990 and 2005. Today only, some 152,000 hectares remain in the country, none of which is considered intact forest (Christopher & Felex, 2022). Because of this forest loss, gorillas and elephants are extinct in Burundi. Uncontrolled cutting of trees for fuel wood coupled with agricultural clearing and livestock grazing are the main causes for the nearly complete deforestation of the country.

Received: 18.03.2024

Accepted: 23.03.2024

Published on: 30.03.2024

The State of Environment Report for Uganda, (2000/2001) noted that, “At the beginning of the 20th century, 45% of the Uganda’s surface area (108,450sq.km) was under forest cover. The present level of forestland is only 21% of its value in 1990 because of deforestation. The major causes of deforestation are provision of wood fuel and clearing of land for agricultural activities (Keneth et al., n.d.).

Ninety percent of the total population who live in rural areas directly depends on firewood for their energy needs, and a big fraction of the urban dwellers depend on charcoal. Overall, 92 percent of Uganda’s source of energy is wood fuel, while only 7 percent are supplied by petroleum and 1 percent by electricity (Ramadhan et al., 2023). The World Bank Report of 1986-estimated production of wood fuel as 15.6 million cubic meters per annum while consumption is about 18.3 million cubic meters, which puts demand in excess of the supply by 2.7 million cubic metres.

Uganda is one of the poorest countries in the world, with a per capita income of about US\$ 300 per year (World Bank-World Development Indicators Database, April 2002), its economy is largely natural resource based, with over 80% of the population living in rural areas and engaged on agro pastoralist for food and income NEMA, (2001). With a Gross Domestic Product (GDP) growth rate of about 6% and a population growth rate of 2.7%, Uganda’s natural resource exploitation will continue to form the basis for livelihoods of the majority people in the near future. Primarily small-scale farmers, with an average farm size of 2.5, are cultivating the land under crops in Uganda ha (Zake et al. 1999). Intruders in search for Arabic land threaten Forest areas since many people are landless (Allan et al., 2023).

Self el Din., (2001) noted that, “The 1993 study by the Government of Uganda revealed that grazing is the most important land use activity in the districts of Kotido, Nakasongola, Mebende

Mityana and Rakia. In Buruli — Nakasongola the land use is made up of grazing 30%, cropping

10-30%, bush land is 5-1-%, rural settlement 5-10%, brick making and 10% charcoal; and other settlement 5%. In Kakuuto and Dodoth, grazing is 75%, 50-60% respectively. It is to be noted that in Buruli the 240,000 heads of cattle is too high for the carrying capacity of pastures. Overgrazing becomes the major factor in deforestation because trees are cut to provide pastures for animals. Similar scenario exists in Dodoth County where there are 80,000 cattle, 50,000 sheep, 70,000 goats and 1,000 donkeys (Christopher & Micheal, 2022).

Uganda’s deforested areas which have turned into dry lands occupy what is commonly referred to as the “cattle corridor”, an area of approximately 84,000 km², stretching from the north-east, through central to south-east of the country. The major problems in Uganda’s dry lands include overgrazing, deforestation, inappropriate farming systems, land and tree tenure and bush burning.

As required by the Committee to Control Deforestation (CCD), Uganda formulated a National Action Programme (NAP) to combat deforestation with assistance from the United Nations Development Programme/Uganda Development Centre (UNDP/UDC) and other partners (Ivan & Florence, 2023). This emphasized on reducing the rate at which trees are cut and increase the number of trees planted.

Different tree planting strategies have been put in place to ensure increase of forest cover in the country. Free tree seedlings are given out at district and parish levels so that people may grow them with a focus on poverty alleviation, food security, and above all, sustain environmental management (Faridah et al., 2023).

Statement of the problem

The research aimed to investigate intricate relationship between deforestation and climate change within Kisoro district, with primary with primary focus on understanding the drivers, impacts and potential mitigation strategies, in order to develop informed policies and innervations for sustainable environmental conservation and climate resilience in the region (Nicholas et al., 2023).

Specific objectives

1. To find out the level of deforestation in Nyundo sub county in Kisoro district.
2. To find out extent of climate changes in Nyundo sub county in Kisoro district.
3. To find out the relationship between deforestation and climate change in Nyundo Sub County in Kisoro district.

Methodology

The researcher employed a descriptive survey research design that helped in gathering information where little knowledge is known. A cross sectional survey design across the respondent in Kisoro district was used to survey the study population. Qualitative data was collected and this enabled the researcher to draw valid and dependable conclusion and recommendation of the study. The study was carried out in Nyundo sub county of Kisoro district in South Western Uganda. The target population considered farmers, Lumberers and the charcoal producers. The total population was targeting 100 people.

Population	Target
Farmers	50
lumberers	15
Charcoal producers	35
Total population	100

Sample size refers to the number of participants or observations included in a study. This number is usually represented by n. The size of a sample influences two statistical properties; 1) the power the study to draw conclusion. The sample size comprised of 80 respondents from Kisoro district. The researcher obtained this sample by use of a sloven's formula below;

Received: 18.03.2024

Accepted: 23.03.2024

Published on: 30.03.2024

$$n = \frac{N}{1 + Ne^2}$$

Where n= Sample size,

N= Total population and e= error tolerance of 0.05

$$n = \frac{100}{1 + 100(0.05)^2}$$

$$n = \frac{100}{1 + 100(0.0025)}$$

$$n = \frac{100}{1.25}$$

n= 80 respondents

Therefore, 40 was farmers, 30 was charcoal producers and sand miners, and 10 was Lumberers. This is because farmers participate much in deforestation that resulted in climate change in Kisoro district than other categories as mentioned above. The researcher constructed an easy, Clear and straight- forward Questionnaire for the comfort of respondents understanding interpretation, and feedback. A structured Questionnaire consisting of both open- ended and closed ended questions based on a set question in relation to the study objectives as was administered in order to gather relevant in-depth information. This helped the researcher to use distant respondents and helped the respondents to think more about the questions and give well-explained and clear answers.

Data processing was done through editing and coding and tabulation data analysis with the help of the SPSS (statistical package for social sciences). This helped the researcher analyse the raw data and transform it into a meaningful and usable information, after this process, a report was written based on the findings. Data analysis is the process of examining what has been collected in a survey and making deductions and inferences (Kothari, 2010). It involves scrutinizing the acquired information and searching of parents of relationship that exist among the data groups (Kombi& Tromp, 2006. Kothari, 2010). The researcher employed both quantitative and qualitative research paradigms in data analysis for purposes of methodological triangulation in-order to enhance the validity and reliability of the study findings (Amin, 2005). The units were sorted according to the study objectives in-order to produce coherent meaning. The Data was then organized, entered into the computer based statistical application program where both inferential and descriptive analysis was carried out. The study results were later presented in form of tables and graphs for easy interpretation. Data was analyzed using SPSS & STATA (Nelson et al., 2022).

RESULTS

Table 2 shows the causes of deforestation.

Causes of deforestation	Frequency	Percentage (%)
Need for charcoal	23	32
Need for firewood	20	28
Land for settlement	15	21

Received: 18.03.2024

Accepted: 23.03.2024

Published on: 30.03.2024

Land for farming	14	19
Total	72	100

From the table above, the respondents were asked of mention the causes of deforestation in Nyundo Sub County and the researcher found out that the most cause of deforestation was need for charcoal by 32%, need for firewood by 28%, land for settlement by 21% and lastly land for farming by 19%.

The effect of deforestation on climate change.

The respondents were asked to list the effects of deforestation on climate change. This was aimed at finding out if the deforestation carried out have effects on climate change.

The respondents listed effects as indicated in the table below

Table 3: shows the effects of deforestation on climate change.

Effects of deforestation on climate change	Frequency	Percentage (%)
Prolonged drought	21	29.1
Unexpected heavy rainfall	34	47.2
Floods	11	15.2
Loss of biodiversity	06	8.3
Total	72	100

From the table above, the researcher found out that the leading effect of deforestation on climate change is Un expected heavy rainfall by 47.2%, followed by pro-longed drought with 29.1%, floods by 15.2%, and loss of biodiversity by 8.3% (Willies et al., 2022).

The level of deforestation in causing climate change.

The respondents were asked of rate the level of deforestation in causing climate change as indicated in the table below.

Table 4: shows the level of deforestation in causing climate change.

Level	Frequency	Percentage (%)
Very high	04	6
High	44	61
Moderate	24	33
Low	0	0
Total	72	100

Table 4 illustrates that out of 72 respondents the researcher found out that majority of them which is 61% rated high, followed by 33% who rated moderate, 6% of them rated very high, and 0% respondents rated low.

The level of climate change

The level of climate change in Nyundo sub county.

The respondents were asked to rate the level of climate change in Nyundo sub county. This aimed at establishing the level of climate change as indicated in the table below.

Table 5. Shows the level of climate change.

Level of climate change	Frequency	Percentage
Very high	5	7
High	49	68
Moderate	18	25
Low	0	0
Total	72	100

From the table above, the researcher found out that majority of the respondents 68% rated High, followed by 25% who rated moderate, 7% rated very high and 0% rated low level of climate change.

Table 6: shows other causes of climate change apart from deforestation.

Other causes of climate change apart from deforestation	Frequency	Percentage (%)
Mining	10	14
Bush burning	21	29
Over cultivation	31	43
Over grazing	10	14
Total	72	100

From the table above, the researcher found out that of 72 respondents, the majority 43% of them said other causes of climate change is the effect of over cultivation, mining and over grazing also cause climate change by the same percentage of 14%, bush burning by 29%.

Relationship between deforestation and climate change.

Relationship between deforestation and climate change.

The respondents were asked to rate by agreeing or disagreeing whether there is a relationship between deforestation and climate change as illustrated in the table below.

Table 7 shows the relationship between deforestation and climate change

Relationship between deforestation and climate change	Frequency	Percentage (%)
Yes	69	96
No	3	4
Total	72	100

From the table above, a researcher found out that 96% of the total respondents agreed that there is a relationship between deforestation and climate change and 4% disagreed that there is no relationship between deforestation and climate change (Nicholas et al., 2023).

The level of relationship between deforestation and climate change.

Table 8 shows the level relationship between deforestation and climate change.

Level of relationship between deforestation and climate change	Frequency	Percentage (%)
Very high	2	3
High	45	63
Moderate	24	33
Low	1	1
Total	72	100

From the table above, the researcher found out that out of 72 respondents 63% the majority rated high, 33% rated moderate, 3% rated very high and lastly the smallest percentage 1% rated low as the level of relationship between deforestation and climate change.

Table 9 shows the possible measures that can be undertaken to reduce deforestation that cause climate change.

Possible measures that can be undertaken	Frequency	Percentage (%)
Mass sensitization of people about the importance of natural resources	21	29
Putting strict laws against deforestation	15	21

Encouraging re – afforestation	16	22
Electricity extension to rural areas	20	28
Total	72	100

From the table above, the researcher found out that out of the total respondents 72, 29% of the respondents which are majority suggested mass sensitization of people about the importance of natural resources, 21% of the respondents suggested putting strict laws against human activities, 22% of the respondents suggested encouraging re- afforestation and afforestation, and lastly 28% electricity extension to rural areas as possible measures that can be undertaken to reduce deforestation causing climate change.

Discussion of the findings

The study was specifically carried out to examine the influence of deforestation on climate in Nyundo Sub County in Kisoro district. In order to achieve this, three specific objectives were raised concerning the influence of deforestation on climate in Nyundo Sub County in Kisoro district. A mixed approach for data analysis were used, involving the use of frequency distribution tables and simple percentage to analyse the data obtained from the research respondents.

Level of deforestation.

At this objective a researcher wanted to know the causes of deforestation, the respondents were asked to mention the causes of deforestation in Nyundo Sub County and the researcher found out that the most cause of deforestation was need for charcoal by 32%, need for firewood by 28%, land for settlement by 21% and lastly land for farming by 19%. The researcher also wanted to know the leading effect of deforestation on climate change, and the researcher found out that the leading effect of deforestation on climate change is Un expected heavy rainfall by 47.2%, followed by pro-longed drought with 29.1%, floods by 15.2%, and loss of biodiversity by 8.3%.

The researcher also wanted to know the level of deforestation in causing climate change; the researcher found out that majority of them which is 61% rated high, followed by 33% who rated moderate, 6% of them rated very high, and 0% respondents rated low.

The level of climate change

The researcher also wanted to know the level of climate, the researcher found out that majority of the respondents 68% rated High, followed by 25% who rated moderate, 7% rated very high and 0% rated low level of climate change.

The researcher also wanted to know other causes of climate change apart from deforestation, the researcher found out that of 72 respondents, the majority 43% of them said other causes of climate change is the effect of over cultivation, mining and over grazing also cause climate change by the same percentage of 14%, bush burning by 29%.

Relationship between human activities and climate change.

Received: 18.03.2024

Accepted: 23.03.2024

Published on: 30.03.2024

The researcher also wanted to know the relationship between deforestation and climate change, a researcher found out that 96% of the total respondents agreed that there is a relationship between deforestation and climate change and 4% disagreed that there is no relationship between deforestation and climate change.

The researcher also wanted to know the level of the relationship between deforestation and climate change, the researcher found out that out of 72 respondents 63% the majority rated high, 33% rated moderate, 3% rated very high and lastly the smallest percentage 1% rated low as the level of relationship between deforestation and climate change.

The researcher also wanted to know the measures that can be undertaken to reduce deforestation causing climate change. the researcher found out that out of the total respondents 72, 29% of the respondents which are majority suggested mass sensitization of people about the importance of natural resources, 21% of the respondents suggested putting strict laws against human activities, 22% of the respondents suggested encouraging re- afforestation and afforestation, and lastly 28% electricity extension to rural areas as possible measures that can be undertaken to reduce deforestation causing climate change.

Conclusions

This study the therefore concludes that respondents have given the overall views to each criteria in the study. Most of the respondents believe that deforestation is the major cause of climate change in Nyundo in Kisoro district.

This study also concludes that the causes of deforestation in Nyundo Sub County were need for charcoal, need for firewood, the need for land for settlement and the need for land for farming.

This study also concludes that the leading effect of deforestation on climate change is unexpected heavy rainfall, followed by prolonged drought.

This study also concludes that majority of the respondents rated that level of climate change was high, followed by moderate, and the lowest number rated very high

Recommendation

There is a need to provide and review programs to the individuals and update law, policies, and regulations that govern the environment to increase standards of the environment and reduce deforestation that cause change climate in Kisoro district

The government should create awareness, train individuals and ensure profit sharing and creating job opportunities to the individuals in Nyundo sub county in Kisoro district in order to reduce deforestation practices.

The research also recommends that mass sensitization of people about the importance of natural resources, putting strict laws against human activities, encouraging re- afforestation and afforestation, and electricity extension to rural areas as possible measures that can be undertaken to reduce deforestation causing climate change.

References

Allan, K., Charles, N., Moses, N., Kazaara, A. G., & Nelson, K. (2023). *The Effect of Operation Wealth Creation on*

Received: 18.03.2024

Accepted: 23.03.2024

Published on: 30.03.2024

- Youth Farmers Development : A Case Study of Labongo Layamo Sub County , Kitgum District.* 7(2), 50–63.
- Christopher, F., & Felex, N. (2022). *Eco-Tourism and Economic Development of People Surrounding Bwindi Impenetrable National Park in Kanungu District.* 6(6), 93–96.
- Christopher, F., & Micheal, M. (2022). *The Role of Tourism on Poverty Reduction of People : A Case Study of Magambo Sub County in Rubirizi District.* 6(5), 23–29.
- Faridah, K., Jacob, K., Barigye, G. B., Kazaara, A. G., & Nelson, K. (2023). *The Role of the Non-Government Organizations in Poverty Alleviation in Uganda : A Case Study of Bugiri Municipality Local Government .* 7(2), 99–111.
- Ivan, N., & Florence, L. (2023). THE TRANSPORT NETWORK SYSTEM AND THE DEVELOPMENT OF THE TOURISM SECTOR. A CASE OF ISINGIRO DISTRICT. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE)* (Vol. 2).
- Keneth, M., Julius, A., & Alex, O. (n.d.). *YOUTH LIVELIHOOD PROGRAMME (YLP) AND POVERTY REDUCTION AMONG YOUTHS IN SHEEMA DISTRICT: A CASE STUDY OF SHEEMA DISTRICT, WESTERN UGANDA.*
- Nelson, K., Christopher, F., & Milton, N. (2022). *Teach Yourself Spss and Stata.* 6(7), 84–122.
- Nicholas, K., Nelson, K., Kazaara, A. G., Deus, T., & Moses, N. (2023). *Examining the Influence of Climatic Change Patterns on Tourism Activities in Uganda . A Case Study of Bududa District .* 7(2), 72–79.
- Ramadhan, B., Alex, I., Kazaara, A. G., Nelson, K., Deus, T., & Pascal, T. (2023). *Taxation and the Development of Small Businesses in Uganda , a Case Study of Iganga District.* 7(2), 136–149.
- Willies, W., Christopher, F., Anthony, W., & Muhindo, M. E. (2022). *Administrative Handling of the Calamities of Floods.* 6(12), 16–18. <https://doi.org/10.1038/nc>
- Winny, N. D., Ariyo, D., Kazaara, G., Kazaara, A. I., & Deus, T. (2023). Effect Of Motivation On Employee Performance In Non-Government Organizations (NGOS): A Case Of Mbale City. In *International Journal of Academic Multidisciplinary Research* (Vol. 7).