

Deforestation And Desertification in Kisoro District: A Case Study of Busanza Subcounty**Akankwasa Eunice¹, Arinaitwe Julius²****1,2 Metropolitan International University****ABSTRACT.**

The major objective of this study lied in finding out whether there was a relationship between deforestation and desertification in Busanza sub county, Kisoro District. Other objectives included: To establish the level of deforestation in Busanza sub-county and to find out the extent of desertification in Busanza Sub-County. The study adopted a descriptive and observational research design and simple random probability sampling technique were used to obtain a sample size 76 respondents of from Mubende Municipality using solven's formula. Questionnaires and interview guides were used to collect data from respondents about the relationship between deforestation and desertification in Busanza sub county, Kisoro District. Objective one aimed at finding out the extent of Mineral Extraction in Mubende District. The researcher concluded on this objective from the findings that the extent of Mineral Extraction is at a higher extent (74.0%) and this is due to many factors which include high need for abundant minerals like Objective one aimed at finding out the level of Deforestation in Busanza sub-county, Kisoro District. The researcher concluded on this objective from the findings that the level of deforestation is high and this is attributed to high demand for timber and need more land for agriculture. Objective two aimed at finding out the extent of Desertification in Busanza Sub- County. The researcher concluded on this objective that the extent of desertification is very high and this is witnessed with long periods of sunshine. The third objective aimed at establishing at the relationship between Deforestation and Desertification in Busanza sub-county. The there is a high positive correlation/relationship between Deforestation and Desertification. The researcher concluded that deforestation is practiced at a high level in order to get timber and fire wood, this leaves the land bear and in a long run led to reduction in rainfall amounts which created desert- like conditions in the area like long periods of drought.

Key words: Deforestation and desertification**Background of the study**

According to (Aisha et al., 2023), deforestation refers to the loss of forest areas worldwide that are lost to other uses such as agricultural arable land, urbanization or mining. Also (Nicholas et al., 2023) defined the term deforestation as the clearing of trees, the conversion of a forested area into cleared land (Loyce, 2023). Deforestation refers to the felling or felling of trees or forests over a large area (Ella, 2010). Deforestation refers to the removal of forest cover where land has been converted to non-forest uses (Morris et al., 2012). According to (Esther et al., n.d.), desertification is the process by which fertile land becomes desert, typically due to drought,

deforestation or unsuitable for agriculture (Niyonzima, 2023). Also (Kilama Luwa et al., 2021) defines the concept of desertification as the process by which the land turns into a desert. In addition, (Suzan & Aggrey, 2023) also defined the term Desertification as the rapid depletion of plant life and loss of topsoil at desert borders and in semi-arid regions caused by a combination of drought and overexploitation of grasses and other vegetation by humans. . Desertification is the process by which a piece of land becomes dry, empty and unsuitable for growing trees or crops (Quispe, 2023). Deforestation is an ancient human activity. The Mediterranean was

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deforested before the 5th century, and Europe also underwent a series of deforestation and regeneration before the 16th century (Nancy & Benard, 2023a). The bulk of the Haitian rainforest was already destroyed by the end of the 19th century (Nancy & Benard, 2023b), and in Ethiopia, India and Lebanon forests were depleted much earlier (Eckholm, 1976). While deforestation has recently slowed in industrialized countries, it has accelerated in developing economies (Ivan & Kazaara, 2023). According to (Charles, 2023; Ronald & Julius, 2023), about 37,000 km² of forested areas are cleared annually in tropical Africa. Recent estimates by Salih

(1992) indicate that the rate of deforestation in tropical Africa exceeds the rate of tree planting by 29 to 1. If current deforestation trends continue, all the closed and open productive forests of tropical Africa are expected to be depleted. over nine decades (Of et al., 2023). Desertification reduces land productivity and contributes to poverty. This is because primary natural resources—fertile topsoil, vegetation cover, and healthy crops—are the first to disappear in the face of desertification (Aisha et al., 2023). As a result, arid countries around the world tend to have the lowest gross domestic product (GDP) per capita and the highest infant mortality rates.

Statement of the problem

Kisoro County, especially Busanza Sub-County, is facing an urgent environmental problem characterized by deforestation and desertification (Quispe, 2023). Extensive deforestation in this region has resulted in significant loss of biodiversity, disruption of ecological balance, and adverse impacts on local communities dependent on forest resources (Esther et al., n.d.). The rapid expansion of agricultural activities, together with inadequate conservation measures, has contributed to soil degradation and erosion (Kazaara et al., 2023), thereby exacerbating the desertification process (Emmanuel et al., 2023). This problem not only poses an immediate threat to the environment but also threatens the livelihoods of residents in Busanza sub-county (Jimmy et al., 2023), which requires urgent attention and strategic interventions to address the root causes and mitigate the far-reaching consequences. deforestation and desertification.

Major objective

The major objective of the study was to find out the relationship between deforestation and desertification in Busanza sub county, Kisoro District.

Specific objectives

1. To establish the level of deforestation in Busanza sub-county.
2. To find out the extent of desertification in Busanza Sub-County.
3. To find out the relationship between deforestation and desertification in Busanza sub county, Kisoro District.

Research questions

1. What is the level of deforestation in Busanza sub-county?

2. What is the extent of desertification in Busanza Sub-County?
3. What is the relationship between deforestation and desertification in Busanza sub county, Kisoro District?

Methodology.

The study used a descriptive research design because of the nature of the variables that were at hand to produce data required for qualitative and quantitative analysis to allow simultaneous description of views, perceptions and beliefs at any single point in time (White B, 2000). Quantitative data was presented on graphs, pie charts and tables. The qualitative research design is descriptive in nature and this enabled the researcher to meet the objectives of the study. Statements were used to assign variables that are not adequately measured using numbers and statistics. The quantitative research design was used in form of mathematical numbers and statistics assigned to variables that may not be easily measured using statements or theme. In this study, the researchers went to different respondents including the LC 1 Chairman and District Environment Officer. The researcher also selected 40 community members and 14 farmers. The researcher further selected 20 farmers from Busanza sub-county and this selection was randomly across all residents in the study area. The procedures included simple random sampling and purposive sampling and were used to select respondents in the study. The study sample comprised of 76 respondents out of 95 of the total population, this was derived from using the Slovincs formula. Where 40 respondents were community members, 20 respondents were farmers and 14 were Traders. 01 District environmental officer and 01 LC1Chairperson were considered as the key informants in the study sample. This is because the population more or less shared similar socio- demographic characteristics and also due to resource and time constraints. Both the use of secondary and primary data methods was used by the researcher to collect qualitative and quantitative data information. Thus, different two methods were used to collect data which included questionnaire and interview method. These were used to collect data from community members, traders and farmers in Kisoro District. Among the critical aspects to consider when assessing data for quality are validity and reliability. The researcher employed these data quality control measures to ensure accuracy of the data that will be collected. The validity of the instruments was established under the guidance of the supervisor (Dr. Arinaitwe Julius). To establish the reliability of the research instruments, the researcher carried out a pilot test of the instruments using another similar group with the same characteristics as the one targeted in the study. The researcher analyzed and interpreted quantitative data by using statistical package for social science (SPSS) program to compute the percentages, frequency and tabulation of responses and both use of quantitative and qualitative types of data (Nelson et al., 2022). Data was edited to identify and eliminate errors made by respondent. Descriptive statistics such as frequency distribution and percentages were used to analyze the data. Qualitative data was analyzed using content analysis in which all the responses were categorized according to their thematic areas and analyzed according to their contents.

Results.**The level of Deforestation in Busanza Sub- County, Kisoro District**

This Section describes the independent variable (Deforestation). The independent variable was addressed in Section

B of the questionnaire for respondents.

Table 1: The level of Deforestation

	N	Range	Minimum	Maximum	Mean	Std. Deviation
level of level of deforestation	60	2.00	1.00	3.00	3.567	.85809
Valid N	60					

The level of deforestation in Busanza sub-county was analyzed and interpreted using the mean which was 3.567, the mean is close to code 4 of the Likert Scale, hence declaring a high level of deforestation in Busanza sub-county. This is because natives cut down trees for timber, agriculture, road construction and settlements. This shows that people in Busanza Sub- County practice deforestation at a high level in order to get timber and fire wood, this leaves the land bear and in a long run led to reduction in rainfall amounts which created desert-like conditions in the area like long periods of drought.

Causes of Deforestation

Table 2: Shows the causes of deforestation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agriculture	18	30.0	30.0	30.0
	Settlement	7	11.7	11.7	41.7
	Industrialization	12	20.0	20.0	61.7
	High need for timber	23	38.3	38.3	100.0
	Total	60	100.0	100.0	

From table 2, the analysis illustrates respondents' perceptions of factors contributing to deforestation in the surveyed population. Approximately 30.0% of respondents identify agriculture, indicating a notable acknowledgment of its role in deforestation. Settlement is mentioned by 11.7%, suggesting a relatively lower emphasis on human settlements as a cause. Industrialization is recognized by 20.0%, signifying a noteworthy awareness of industrial activities contributing to deforestation. The most prevalent factor identified is the high need for timber, with 38.3%

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attributing deforestation to timber extraction. The cumulative analysis reveals that, together, Agriculture, Settlement, and Industrialization contribute to 61.7% of respondents' views on deforestation, while the High need for timber category encompasses the entirety of the surveyed population.

Table 3: Shows the perception on desertification as a cause of famine in Busanza sub-county

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DISAGREE	10	16.7	16.7	16.7
	DISAGREE	7	11.7	11.7	28.3
	NEITHER AGREE NOR DISAGREE	1	1.7	1.7	30.0
	AGREE	10	16.7	16.7	46.7
	STRONGLY AGREE	32	53.3	53.3	100.0
	Total	60	100.0	100.0	

Findings from the table 3 above indicate the analysis reveals diverse viewpoints within the surveyed population. Approximately 16.7% strongly disagree with the notion, indicating a notable segment with a clear opposing stance, while 11.7% express a general disagreement. A small proportion (1.7%) neither agrees nor disagrees, suggesting a level of ambivalence or neutrality towards the connection between desertification and famine. On the affirmative side, about 16.7% agree with the statement, reflecting a balanced distribution of agreement and disagreement. Notably, the majority, constituting 53.3% of respondents, strongly agree that desertification is a significant cause of famine in Busanza sub-county, highlighting a dominant consensus within the surveyed population on this issue. The cumulative analysis underscores the prevalent perspective, as 46.7% either agree or strongly disagree, while 30.0% neither agree nor disagree or disagree, indicating a substantial inclination towards the belief that desertification contributes significantly to famine in the region.

Relationship between Deforestation and Desertification in Busanza Sub- County

Table 4: Showing Pearson Correlation between deforestation and desertification

Correlations		
	Deforestation	Desertification
Pearson Correlation	1.00	.709
Sig. (2-tailed)		.000

Desertification	N Pearson	60	60
	Correlation	.709	1.00
	Sig. (2-tailed)		
	N	000	
		60	60

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

Table 4 indicates that there is a very strong positive relationship between deforestation and desertification at $r = 0.709$ and since the sig. value (.000) was far less than 0.01, which is the threshold level of significance required declaring a statistically significant relationship between deforestation and desertification. This shows that people in Busanza Sub- County practice deforestation at a high level in order to get timber and fire wood, this leaves the land bear and in a long run led to reduction in rainfall amounts which created desert-like conditions in the area like long periods of drought.

Regression Analysis on deforestation and desertification.

Since correlation analysis reveals strong positive significant relationship between desertification and deforestation, the research found it worth to conduct regression analysis so as to determine the magnitude of effect deforestation on desertification. The Model summary and Analysis of Variance (ANOVA) results are presented in below.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.201 ^a	.364	.361	1.15921

The regression analysis shows correlation coefficient of determination (R^2) to be 0.20. This implies that for every unit increase in the deforestation, the desertification increases by 0.201 units. The R^2 value of 0.364 indicated that only 36.4% of the variations in the desertification were explained by deforestation in Busanza sub county while the remaining 63.6% of the variations are caused by other factors such as swamp reclamation as revealed by respondents. Since the Durbin-Watson statistic of 1.461 is close to 2, it implies that the assumption of independent error is tenable. The Analysis of Variance (ANOVA) result was used to test whether the generated Model 1 was significantly better at predicting desertification than using means as the best guess (Nelson et al., 2023).

Summary of Findings

The level of deforestation in Busanza sub-county was analyzed and interpreted using the mean which was 3.567, the mean is close to code 4 of the Likert Scale, hence declaring a high level of deforestation in Busanza sub-county. This is because natives cut down trees for timber, agriculture, road construction and settlements. This shows that people in Busanza Sub- County practice deforestation at a high level in order to get timber and fire wood, this leaves the land bear and in a long run led to reduction in rainfall amounts which created desert-like conditions in the area like long

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periods of drought.

The extent of Desertification in Busanza sub-county was analyzed and interpreted using the mean which was 4.5800, the mean is close to code 5 of the Likert Scale, hence declaring a high extent of deforestation in Busanza sub-county.

This is because natives cut down trees for timber, agriculture, road construction and settlements.

Findings further indicate that there is a very strong positive relationship between deforestation and desertification at $r = 0.709$ 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 deforestation and desertification, this implies that when the level of deforestation is high, the level of desertification is also high, and when the level of deforestation is low, the level of desertification is also low. This shows that people in Busanza Sub- County practice deforestation at a high level in order to get timber and fire wood, this leaves the land bare and in a long run led to reduction in rainfall amounts which created desert-like conditions in the area like long periods of drought.

Conclusion of the findings.

Objective one aimed at finding out the level of Deforestation in Busanza sub-county, Kisoro District. The researcher concluded on this objective from the findings that the level of deforestation is high and this is attributed to high demand for timber and need more land for agriculture. Objective two aimed at finding out the extent of Desertification in Busanza Sub- County. The researcher concluded on this objective that the extent of desertification is very high and this is witnessed with long periods of sunshine. The third objective aimed at establishing the relationship between Deforestation and Desertification in Busanza sub-county. There is a high positive correlation/relationship between Deforestation and Desertification. The researcher concluded that deforestation is practiced at a high level in order to get timber and fire wood, this leaves the land bare and in a long run led to reduction in rainfall amounts which created desert-like conditions in the area like long periods of drought.

Recommendations of the study

The researcher recommended the government to provide enough sensitization of the masses/people about the dangers of deforestation and encourage planting of trees.

The researcher recommends farmers to practice good farming methods like afforestation, re- afforestation and agro-forestry in order to conserve the forests.

The researcher recommends the community members to always conserve forests for future generations.

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