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Examining the Influence of Climatic Change Patterns on Tourism Activities in Uganda. A Case Study of Bududa District.

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Abstract*: The research focused on the tourist activities in the Budduda district and trends of climatic change. In this study, the dependent variable for tourism activities was food supply, travel services, and lodging, whereas the independent variable for climatic change patterns was drought, floods, and landslides.The study's cross-sectional approach enabled the researcher to quickly collect samples from the population for analysis. The respondents from Budduda district were the main subject of the study. The participants were selected through stratified random sampling from all of the cluster's layers by the researcher, who used various departments as clusters. We used both primary and secondary data collection methodologies. The data collection and analysis were carried out using quantitative research methods. The results of the study's correlation analysis typically demonstrated a significant positive association between the signs of climatic change (drought, floods, and landslides) and the variables of tourism activity (food supply, travel services and housing). Additionally, regression analyses found that the variables of climate variability patterns—drought, floods, and landslides—were better predictors of the variation in tourism activities (dependent variable). The most important predictor of changes in tourism activity was flooding, followed by landslides and drought.*

Key words: climate change, floods, landslides and tourism activities

Background to the Study

The Rwenzori Mountains and adjacent areas, like as Bududa District, are experiencing various effects of climate change.

In 2012, forest fires destroyed vegetation that controlled the flow of rivers downstream, reaching heights of over 4,000 meters, which would have been unthinkable in the past.

Since then, a pattern of less frequent but stronger rainfall has been witnessed by the communities residing at the base of Mount Rwenzori, along with some of the most disastrous floods the region has ever seen. (Abubaker, 2021) asserts that the landslides destroyed homes, markets, and churches in three villages, displacing 5,000 people and killing an estimated 400 persons.

The effects of climate change have, however, changed the seasons all across the world, with some countries facing worse droughts and shorter or longer rains, particularly in eastern and north-eastern Uganda.

The East African Community Climate Change Policy was created in response to a directive given by the Heads of State of the East African Community (EAC) Partner States at their 11th Summit Meeting, held in Arusha, Tanzania on November 20, 2009, to address the climate change's negative consequences in the region. It is doing so in response to the increasing concern about the threats posed by the detrimental effects of climate change on the implementation of defined targets and goals in the region. Additionally, it satisfies one of the goals of the Community, which was to create policies and initiatives that would increase and deepen cooperation among Partner States. The East African Community Climate Change Policy's ultimate purpose is "to provide Partner States and other stakeholders with guidance on the formulation and execution of collective policies to address Climate Change in the area while ensuring sustainable social and economic development" (EAC, 2010).

The main contributors to climate change are greenhouse gas emissions from human activities like deforestation, industrialization, burning of fossil and biofuels, and agricultural output. These gases interact with the ozone, a thin covering that shields the planet from the sun's direct heat. When this layer is removed from the earth's atmosphere, sunlight strikes the surface of the world directly, start increasing that modify the climate of the planet and cause global warming, protracted droughts, and unpredictable rains. The industrialized nations, including the United States of America and member states of the European Union, are the largest producers of these emissions and, as a result, the biggest contributors to climate change (Praveen, 2005). However, developing nations with fast economic growth, like China and India, are starting to show signs of rapid economic growth

Statement of the Problem

The world's largest environmental social resistance is climate change (WTTC, 2011). According to the IPCC and numerous other research, Africa is one of the world's regions that is most vulnerable to the consequences of climate change (Boko, 2010). The IPCC claims that there is conspicuous absence of geographic balance in the evidence and literature on observed changes, with a clear dearth of material from developing nations (IPCC, 2007; Hope, 2009). The UNWTO, the IPCC, and the Government of Uganda have all noted that tourism is one of the most vulnerable industries along with agriculture and biodiversity, despite the fact that it is also a substantial economic sector (IPCC, 2007). The Bududa District has suffered greatly from extreme temperatures, droughts, and rainfall.

However, despite the government of Uganda's continuing efforts to address climate change and boost the tourism sector, individuals / groups continue to voice their displeasure with subpar services. Even while the government, especially the tourism board, makes attempts to solve this, it doesn't appear that the patterns of climate change have significantly changed. It is unclear, though, if this is a result of droughts, floods, or landslides as a result of climatic change patterns.

Specific Objectives

1. To establish the effect of drought on tourism activities in Uganda.
2. To evaluate the influence of floods on tourism in Uganda.
3. To assess the effect of landslides on tourism activities in Uganda.

Research Questions

1. What is the effect of drought on tourism activities in Uganda?
2. What is the influence of floods on tourism in Uganda?
3. What is the effect of landslides on tourism activities in Uganda?

METHODOLOGY

Research Design

A case study research design was used in the study. By using a case study approach, the researcher was able to carry out an exploratory examination into a current phenomenon while taking into consideration the "how" and "why" questions that were raised all through the data collection process.

Interdependently, both qualitative and quantitative techniques were used. The study variables were investigated thoroughly using the qualitative approach. On the other hand, the analysis of statistical information gleaned from questionnaires was done using the quantitative approach.

Quantitative strategy

This aspects of the process a theory that was based on data that was quantified and statistical techniques were used to examine it. The objective of the quantitative technique was to ascertain the validity of the theory's prediction generations.

A qualitative strategy

This method involves an investigation technique with the objective of comprehending the social or human issue. The goal of qualitative study in the tourism industry was to create a comprehensive and complex picture of customer satisfaction in the Bududa District.

The "why" of customer pleasure was the main emphasis of qualitative research, which depended on firsthand customer experiences?

Study Population

The study population is defined as the entire group of individuals, events or objects having common observable characteristics. The population of the study constituted 123, 100 (population and housing census of Uganda,2002).
Krecjie and Morgan (1970) sample population and sample size determination table postulate that a study population of 123,100 respondents considers a sample size of 384 respondents randomly selected.

Sample size and selecting techniques

Sample Size

Sample sizes of fewer than ten are often not advised. Successful research can be carried out with samples as small as between 10 and 20 in straightforward experimental studies with strict controls. So, when obtaining data for this study, a sample size of 384 was taken into account.

Sampling methods

Simple random sampling

The homogenous sample population's information was gathered via simple random sampling. Because of their enormous numbers, the researcher used clusters to quickly gather data from relatively large subsets. To remove any possibility of bias from the accessible population, simple random sampling was also performed. Every member of the population was given an equal and independent chance of being chosen for the sample.

Data sources

The researcher used both Primary and secondary sources of data to conduct the investigation.

Primary sources

Primary data was obtained from the research made using questionnaires and interview questions. These were mainly from the respondents and were extracted from questionnaires and interview questions.

Secondary sources

The researcher obtained secondary data from the published articles such as journals, theses, and previous researchers published texts.

Data analysis

After collecting and cleaning the data, it was coded then entered in a computer using Statistical Package for Social Scientists (SPSS) version 20. Various statistical tests were run to analyze the data.

RESULTS

Demographic characteristics of the respondents

Gender of the respondents

Table 1 Distribution of the respondents by their Gender

Gender of the respondent	Frequency	Percent	Valid Percent	Cumulative Percent
Males	220	57.9	57.9	57.9
Females	160	42.1	42.1	100.0
Total	380	100.0	100.0	

Source: Primary Data

From Table 1 it is indicated that of the total (380) respondents, 57.9% of them were males whiles 42.1% were females. It implies that more males participated in the study compared to females**.**

Current age of the respondents and Gender of the respondents

Table 2: Distribution of respondents by their age

Age of the respondent	Frequency	Percent	Valid Percent	Cumulative Percent
10-20	40	10.5	10.5	10.5
21-30	81	21.3	21.3	31.8
31-40	96	25.3	25.3	57.1
41-50	109	28.7	28.7	85.8
50+	54	14.2	14.2	100.0
Total	380	100.0	100.0	

Source: Primary Data

From the Table 2, it was noted that majority (28.7%) of the respondents were in the age group 41-50 years, followed by 25.3% in the age group 31-40, 21.3% in the age group 21-30, 14.2% in the age group 50+ and 10.5% in age group 50+ respectively. Thus, majority of the participants were from the age group 41-50 while the least number of participants were aged 10-20 years.

Duration of time working in the company

Table 3: Distribution of respondents by how long they have been in the company

Duration in Budduda district	Frequency	Percent	Valid Percent	Cumulative Percent
1years	67	17.6	17.6	17.6
2 years	83	21.8	21.8	39.5
3 years	122	32.1	32.1	71.6
4 years	95	25.0	25.0	96.6
5+ years	13	3.4	3.4	100.0
Total	380	100.0	100.0	

Source: Primary Data

Table 4.3 shows that of all the respondents, 17.9% had worked for 1 year, 21.8% had worked for 2 years, 32.1% had worked for 3 years, 25.0% had worked for 4 years while 3.4% had worked for 5+years.

Education of the respondents

Table 4: Distribution of respondents by their level of education

Level of education	Frequency	Percent	Valid Percent	Cumulative Percent
"O" Level	41	10.8	10.8	10.8
"A" level	68	17.9	17.9	28.7
Certificate	81	21.3	21.3	50.0
Diploma	81	21.3	21.3	71.3
Bachelors degree	55	14.5	14.5	85.8
Postgraduate diploma	27	7.1	7.1	92.9
Masters	27	7.1	7.1	100.0

Total	380	100.0	100.0	

Source: Primary Data

Table 4.4 shows that 10.8% of the respondents had attained "O" level certificates, 17.9% had attained "A" level certificates, 21.3% had attained certificates, 21.3% had attained diplomas, 14.5% had attained bachelor's degrees, 7.1% had attained postgraduate diplomas and 7.1% had attained master's degrees.

Gender and Age of the respondents

Table 5: Distribution of respondents by their gender and age

Gender of the respondent		Age of the respondent					Total
		10-20	21-30	31-40	41-50	50+	
	Males	14	27	69	69	41	220
	Females	26	54	27	40	13	160
Total		40	81	96	109	54	380

Source: primary data

From Table 5, it was noted that of the total respondents, 220 were males while 160 were females. Of the 220 males, 14 were aged 10-20 years, 27 were aged 21-30 years, 69 were aged 31-40 years, and 69 were aged 41-50 years while 41 were aged 50+ years. Of the 160 female 26 respondents, were aged 10-20 years, 54 were aged 21-30 years, 27 were aged 31-40 years, and 40 were aged 41-50 years while 13 were aged 50+ years.

Gender and level of education of the respondents

Table 6: Distribution of respondents by their gender and level of education

Level of education of the respondent		Gender of the respondent		Total
		Males	Females	
	"O"	14	27	41
	"A"	28	40	68
	Certificate	54	27	81
	Diploma	41	40	81
	Bachelors degree	55	0	55
	Postgraduate diploma	14	13	27
	Masters degree	14	13	27
Total		220	160	380

Source: primary data

Table 6 indicates that there were 14 men and 27 women among the 41 respondents who had earned "O" level certificates. 28 men and 40 women out of the 68 respondents who had earned "A" level certificates. 54 men and 27 women out of the 81 respondents who had received certificates. 41 men and 40 women out of the 81 respondents who had earned diplomas. There were 55 responders who received bachelor's degrees, including 55 men and 0 women. There were 14 men and 13 women among the 27 respondents who had postgraduate degrees. There were 14 men and 13 women among the 27 responders who had received master's degrees.

Correlations Analysis

The correlations were obtained to show the relationship between the variables with reference to the three research objectives;
Ho: There is no effect of drought on tourism activities in Uganda.
Ha: There is an effect of drought on tourism activities in Uganda.
Ho: There is no influence of floods on tourism in Uganda.

Ha: There is an influence of floods on tourism in Uganda.
Ho: There is no effect of landslides on tourism activities in Uganda
Ha: There is an effect of landslides on tourism activities in Uganda

Table 7: Pearson Correlations Matrix

Correlations		DROUGHT	FLOODS	LANDSLIDES	TOURISM ACTIVITIES
DROUGHT	Pearson Correlation	1	.818**	.766**	.797**
	Sig. (2-tailed)		.000	.000	.000
	N	380	380	380	380
FLOODS	Pearson Correlation	.818**	1	.886**	.904**
	Sig. (2-tailed)	.000		.000	.000
	N	380	380	380	380
LANDSLIDES	Pearson Correlation	.766**	.886**	1	.881**
	Sig. (2-tailed)	.000	.000		.000
	N	380	380	380	380
TOURISM ACTIVITIES	Pearson Correlation	.797**	.904**	.881**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	380	380	380	380

**. Correlation is significant at the 0.01 level (2-tailed).
Source: primary data

To establish the effect of drought on tourism activities in Uganda.

There is a high positive correlation coefficient (0.818) between the effects of drought on tourism activities and therefore since the P-value (0.00) is less than 0.05, the effects of drought on tourism activities are statistically significant at 95% confidence interval and therefore we reject the null hypothesis**.**

To evaluate the influence of floods on tourism in Uganda.

There is a high positive correlation coefficient (0.797) between the influences of floods on tourism activities and therefore since the P-value (0.00) is less than 0.05, the effects of drought on tourism activities are statistically significant at 95% confidence interval and therefore we reject the null hypothesis**.**

To assess the effect of landslides on tourism activities in Uganda

There is a high positive correlation coefficient (0.818) between the effects of landslides on tourism activities and therefore since the P-value (0.00) is less than 0.05, the effects of drought on tourism activities are statistically significant at 95% confidence interval and therefore we reject the null hypothesis**.**

Regression analysis

Table 8: Regression Model for the study variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	3.789	.564		-6.723	.000	-4.898	-2.681
	DROUGHT	.263	.070	.132	3.774	.000	.126	.400
	FLOODS	.816	.080	.490	10.140	.000	.658	.974

LANDSLIDES	.718	.090	.346	8.019	.000	.542	.894

a. Dependent Variable: TOURISM ACTIVITIES
R Square =.853 F Statistic = 724.896
Adjusted R Square =. 851 Sig. F Statistic =.000
b. Predictors in the Model: (Constant), drought, floods and landslides).

Y=-1.489+BiXi i = 1,2,3,4

Source: Primary Data

Ho: There is no effect of drought on tourism activities in Uganda.
Ha: There is an effect of drought on tourism activities in Uganda.
Ho: There is no influence of floods on tourism in Uganda.
Ha: There is an influence of floods on tourism in Uganda.
Ho: There is no effect of landslides on tourism activities in Uganda
Ha: There is an effect of landslides on tourism activities in Uganda
Keeping other factors constant, a one percent increase on the effects of drought would on average lead to 0.263 increase on their effects on tourism activities. Since the P-value (0.00) is less than 0.05 at 95% confidence interval, we reject the null hypothesis and conclude that the effects of drought on tourism activities are statistically significant at 95% confidence interval.

Keeping other factors constant, a one percent increase on the effects of floods would on average lead to 0.816 increase on their effects on tourism activities. Since the P-value (0.00) is less than 0.05 at 95% confidence interval, we reject the null hypothesis and conclude that the effects of floods on tourism activities are statistically significant at 95% confidence interval.

Keeping other factors constant, a one percent increase on the effects of landslides would on average lead to 0.718 increase on their effects on tourism activities. Since the P-value (0.00) is less than 0.05 at 95% confidence interval, we reject the null hypothesis and conclude that the effects of landslides on tourism activities are statistically significant at 95% confidence interval.

Conclusions

The primary goal of the study was to investigate how climatic change patterns and tourism activities relate to one another.
The independent variable in this study was "climatic change patterns," and the dependent variable was "tourist activities." Drought, flood, and landslide patterns were used to measure climatic change. The accessibility of food, transport services, and housing were used to gauge tourism activity.
The findings in chapter four and the discussions indicated that correlation analyses were performed in regard to each individual target, and that overall there was a substantial positive association between climate change patterns and tourism activities. Since r =.797 and p=.000.01 were established in Table 7, it was concluded from the results that there was a substantial positive relationship between drought and tourism activity. Still in relation to the first aim, regression analysis was conducted, and it was discovered that, as shown in Table 7, generally speaking, attributes related to drought contributed significantly to the explanation of changes in tourism activity. This clarifies the correlation results' identification of a strong positive relationship.
Drought and tourism-related activities have an augmented feedback relationship with the first objective. The district authorities must therefore ensure that they prioritize the drought while also taking into consideration floods and landslides, respectively, amid patterns of climate change.
Additionally, taking regression analysis into account in regard to the second aim revealed, as shown in Table 8, that floods significantly contributed to the explanation of the variation.

As a result, the Budduda district must make sure that floods are taken into account but given relatively great significance.

Regarding the third aim, it was determined that there was a strong, favorable, and significant link between landslides and tourism activities, as shown by the r=.881 and p=.000 in (Table 7).

In Table 4.8, it was determined that the Beta value and sig value were greater compared to drought when considering regression analysis in relation to the third objective.

In conclusion, it's important to remember that, out of the three climate change patterns, floods showed a stronger relationship with tourism than did drought and landslides. As a result, floods, landslides, and drought should be managed in that order.

Recommendations

According to the results from Table 7, there is a significant positive relationship between drought and tourism activities in the respondents' opinions with regard to the first objective, "To establish the effect of drought on tourism activities in Uganda." The r, sig (p), and beta values in the correlation Table 7 and regression Table 8 support the researcher's suggestion that the District take drought into account after floods and landslides, respectively.

In relation to the second goal, "To examine the effect of floods on tourism in Uganda," the researcher advises the District authorities to prioritize allocating more resources, especially financial ones, to combating floods before considering alternative options. This is seen by the significantly lower values of r,p, and beta for landslides and dryness in Tables 7 and 8.

To measure the impact of landslides on tourism activities in Uganda, the third objective, the researcher advises the District authorities to give landslides all the support they need because, if they don't, tourism activities will be seriously affected. This is because this objective has the highest level of significance, as shown by Tables 7 and 8.

Other elements that lead to variability in the tourism activities were also discovered from the regression model. Consequently, given that these other elements don't contribute to the problem, the researcher advises the District authorities to focus more on those that do Table 8 in the Regression analysis shows that the contribution of floods to the variation in tourism activities was greater than for other factors. This suggests that floods should be given top priority considering they caused the greatest variability in tourism activities.

In Tables 8, regression analysis also showed that, in conjunction to floods, landslides significantly contributed to the explanation of the variation in tourism activities. Therefore, it is advised that if better outcomes from tourism operations are to be obtained, floods should be taken into account first, followed by landslides and drought, respectively. Regression analysis in regard to the third objective, in Table 8, it was found out that all the three factors of climatic change patterns under study contributed significantly to the prediction of overall 85.1% variation in tourism activities. It is therefore recommended that the district should render all the necessary support to the three factors so as to improve on tourism activities.

From the Regression Table 8, it was observed that, drought, floods and landslides accounted for 85.1% variation in tourism activities. However, of the three, it is recommended that floods be given priority, though, landslides also significantly contributed to the variation in tourism activities.

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