
LANDSLIDES AND HOMESTEADS AROUND MUBUKU REGION IN MALIBA SUB COUNTY IN KASESE DISTRICT

1 Mugume Adolf, 2 Natukunda Charles

1, 2 Metropolitan International University

ABSTRACT

The study aimed at landslides and homesteads around Mubuku region in maliba sub county in kasese district and it was guided by the following objectives; To identify the different types and characteristics of landslides in Mubuku sub-county, to quantify the impacts of landslide on homesteads and other key property assets and to establish the strategies being taken by the local communities in mitigating the impact of landslide around Mubuku sub-county. This study used both qualitative and quantitative research design. Qualitative approaches were used whereby a case design was used in the selected sample area. Descriptions basing on the study were obtained from the respondents within the selected area. The study also used interview and questionnaires to get descriptions from the respondents. In this study both qualitative and quantitative methods were used to analyze the data that was collected from the field using SPSS. However, from the findings, respondents revealed that they often get support from local organizations including but not limited to Ensco Uganda limited (58.9%), Semuliki Co-operative (22.1%) and Bundibugyo Local Government (18.9%). Studies on sustainable agricultural practices such as agro-forestry, terracing among others should be done around Mubuku Sub County. These should aim at identifying and establishing the most appropriate practices to be employed by the community members to reduce on the levels of vulnerability to landslides in the area.

Key words: landslides and homesteads

Background of the study

Landslides are among the most damaging natural hazards in mountainous areas around the world (Coro minas et al., 2014) and they are expected to occur in future under the same circumstances that caused them in the past (Nicholas et al., 2023). The natural disaster contributes to some of most devastating impacts including loss of human lives, properties and infrastructure in many parts around the globe (Chen et al., 2018). According to (Nicholas et al., 2023), the Eastern African regions have experienced major landslides in the recent years and have caused many fatalities and injuries, loss of many hectares of productive farmlands and destruction to infrastructure such as roads, railways and bridges, the warm and wet climate of the landslide-prone regions causes rapid weathering and produces are goliath weaker than the underlying rock with an interface between the two layers (Christopher, 2022). This interface serves as the most common plane along which landslides are initiated once it becomes saturated. Landslides in the region are associated with steep topography, human activities such as deforestation, overgrazing, and unplanned farming on steep slopes and are induced by earthquakes and high intensity of rainfall (Francis et al., 2023). The landslide-prone areas are agriculturally very productive and the inhabitants depend on agriculture for their livelihood. The areas also contribute substantially to the national food reserve. The landslides are therefore a burden to the economies of the individual farmers and national governments of the region.

Received: 13.10.2023

Accepted: 16.10.2023

Published on: 30.10.2023

Corresponding: Author: research.miu.ac.ug/publications

Most of these landslides occurred in areas of high agricultural potential which are highly populated. These areas are characterized by high rainfall, steep slopes of red-brown soils which are derived from volcanic rocks. The soils generally are acidic (pH 4.0 to 6.0) and therefore are favorable for production of tea, Arabic coffee and temperate climate fruits such as plums and subsistence crops such as potatoes and maize (Grace et al., 2023)

Heavy rains triggered these landslides on the steep slopes of Mt. Rwenzori in Uganda on March 1, 2010 as per the Ministry of Disaster and Preparedness in Kasese. As the older scars hint, landslides are common in the region, but the new landslides are much larger than previous slides. The slides affected three villages, leaving 83 dead and more than 300 missing as of March 8, 2010; reported the United Nations Office for the Coordination of Humanitarian Affairs (Christopher & Micheal, 2022).

This natural-color image, acquired by the Advanced Land Imager on NASA's Earth Observing-1 (EO-1) satellite on March 11, 2010, provides clues that the landslide area had been highly populated. Bright roves reflect light extremely well. Tiny white dots scattered across the western slopes of Mt. Rwenzori are probably structures. Several structures surround the slides. Heavy rain caused the slides, but deforestation may have also played a role, said the Ugandan government. Dark green forest grows on the slope above the slide area. A strip of pale green land, free of settlements, separates the forest from the slide. This region had been deforested since 2007, according to the government analysis. On a steep slope, trees anchor the soil (Christopher & Felex, 2022). Deforested mountains are very prone to landslides

Problem statement

The problem of landslides in Mubuku around Kasese district has been rampant for many years due to heavy rainfall patterns and heavy deforestation along the slope areas for agricultural production (Nkonya et al., 2002). Landslides have caused destruction of several hectares of farmers' crops such as vanilla and cocoa, death of people while others are often left homeless. It is not yet clear how homesteads have been affected (Kazaara et al., 2023). Despite the fact that member states have tried to use local measures to reduce the impacts of landslides for example using sacks filled with stones to prevent mass movements along the slopes, a question still stands whether there has been a follow up on the appropriate remains how effective are the measures of controlling the landslides. This research was based on the above information gap to investigate the impact of landslides on homestead and measures in place to address the problem (Zowena et al., 2023)

Specific objectives

1. To identify the different types and characteristics of landslides in Mubuku sub-county
2. To quantify the impacts of landslide on homesteads and other key property assets.
3. To establish the strategies being taken by the local communities in mitigating the impact of landslide around Mubuku sub-county.

Methodology

Received: 13.10.2023

Accepted: 16.10.2023

Published on: 30.10.2023

Corresponding: Author: research.miu.ac.ug/publications

Research design.

This study used both qualitative and quantitative research design. Qualitative approaches were used whereby a case design was used in the selected sample area. Descriptions basing on the study were obtained from the respondents within the selected area. The study also used interview and questionnaires to get descriptions from the respondents. Quantitative research was used in data presentation like the use of tables.

Study Population size

Amin (2005) defines study population as a complete collection of the elements that are of interest in a particular investigation. It is also defined as the entire set of cases from which research samples is drawn (Wilson 2010). The research was conducted on the local people, local leaders, environmental officer sand the officer in charge of Disasters.

Sample and sample size.**Sample**

Kothari (2009) define sample as the selected items, units or elements which the researcher conclusion he made. In this study the sample was included, local people, local leaders, environmental officers and the officer in charge of Disasters of Mubuku Kasese District

Sample size

Kothari (2008) defines sample size as “the number of items to be selected from the universe to constitute a sample.” The sample size was derived from the total population, in this study the sample size was 50 respondents. The sample size in this study was chosen as follows

Table 1: showing the sample size

RESPONDENTS	NUMBER
Local leaders	45
Environmental officers	4
Minister for Disaster	1
Total	50

Sampling techniques

Kombo and Delno (2006) defined sampling as a procedure the researcher uses to gather people, places or things to study. It is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative characteristics found in the entire group. The study used both simple random sampling and purposive sampling techniques.

Simple random sampling.

According to Kothari (2009) simple random sampling is the type of sampling under normal circumstances is the ideal type of sample because it shows no bias. Every member of the total population has an equal chance of being selected and selection of one member does not affect the probability of selection of another member. I used this technique to get 4 people to

Received: 13.10.2023**Accepted: 16.10.2023****Published on: 30.10.2023**

represent the rest, under this procedure the researcher wrote the names of all respondents on pieces of paper, fold them, mix them and pick four pieces of paper with names of people written on them, these was used as sample, the same procedures were used to get the study area also was used to get samples.

Purposive sampling

Kombo and Tromp (2006) defined the purposive sampling techniques as the sampling technique where the researcher purposively targets a group of people reliable for the study and in this case the respondents are from different areas.

The purposive sampling was also used to get key informants like environmental officer, and minister for disaster from the selected study area. This is because these are people who are believed to be relevant and knowledgeable to ensure relevant information concerning the land slides in the study area.

Data Collection Tools

Questionnaire,

The Oxford Advanced Learners' Dictionary (2010) defined questionnaire as a written or printed list of questions to be answered by a number of people especially as part of survey. This technique involved written questions to which the respondents were required to write answers individually with no researcher's guide. The questionnaires were in two forms, the open-ended questionnaire that required the respondents to answer the way they wish and the Close-ended questionnaire which limited the respondents to answer "YES" or "NO".

Data analysis

Data analysis refers to the process of examining data which have been collected. In this study both qualitative and quantitative methods were used to analyze the data that was collected from the field using SPSS (Nelson et al., 2022).

RESULTS

Table 1. Indicators of the occurrence of landslide sin Mubuku sub county.

MATERIAL AFFECTED	TYPE			
	Shallow %	Small %	Broad %	Total
<i>Fracturing of soil</i>	25.8	2.7	4.1	32.6
<i>Slumping of slopes</i>	36.6	3.9	5.9	46.3
<i>Slight movement of soil and mud</i>	16.6	1.8	2.7	21.1
<i>Total</i>	78.9	8.4	12.6	100.0

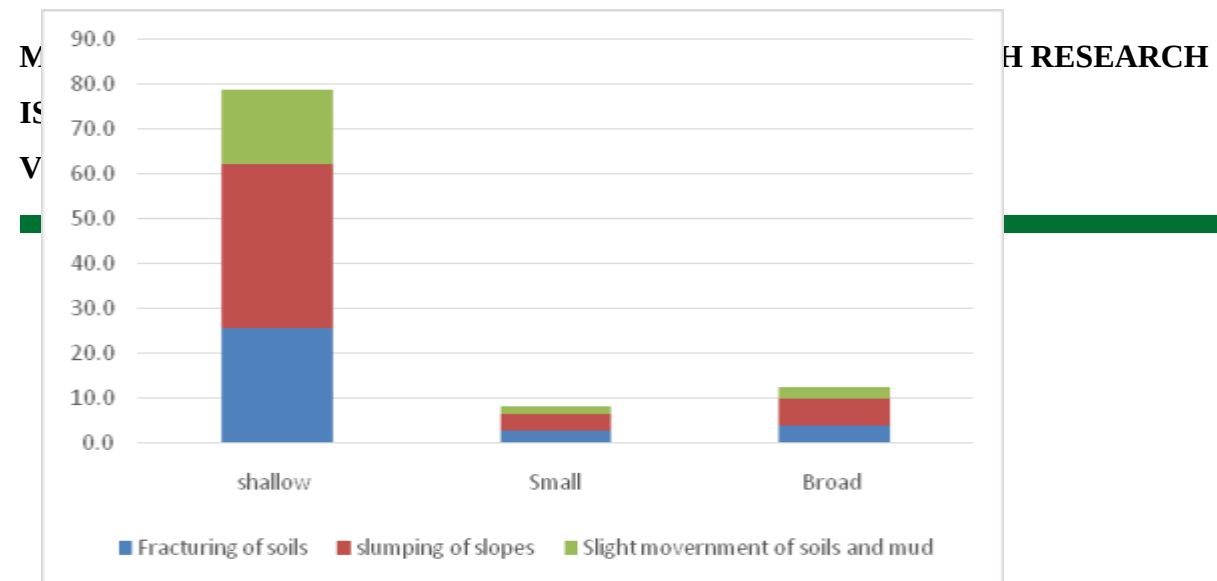


Figure 1. Types and characteristics of landslides in Mubuku sub county

The landslides were not uniformly distributed as per figure1 shows where a total of 31 landslides were identified and observed as follows;15 in Isle 1 and appeared to be on a steep slope, a total of 10 landslides in Nyabikuba on gentle and flatland and 6 in Nyakalengija Villages respectively.

Length and width of landslides

Table 2. Average mean values of Landslide measurements taken in Mubuku Sub County

Landslide measurement	Width (m)	Length (m)	Slope (gradient)
Max	28	28	0.7
Min	78	9.0	0.1
Mean	32.5	17.9	6.4
Standard deviation	29.7	6.5	0.1

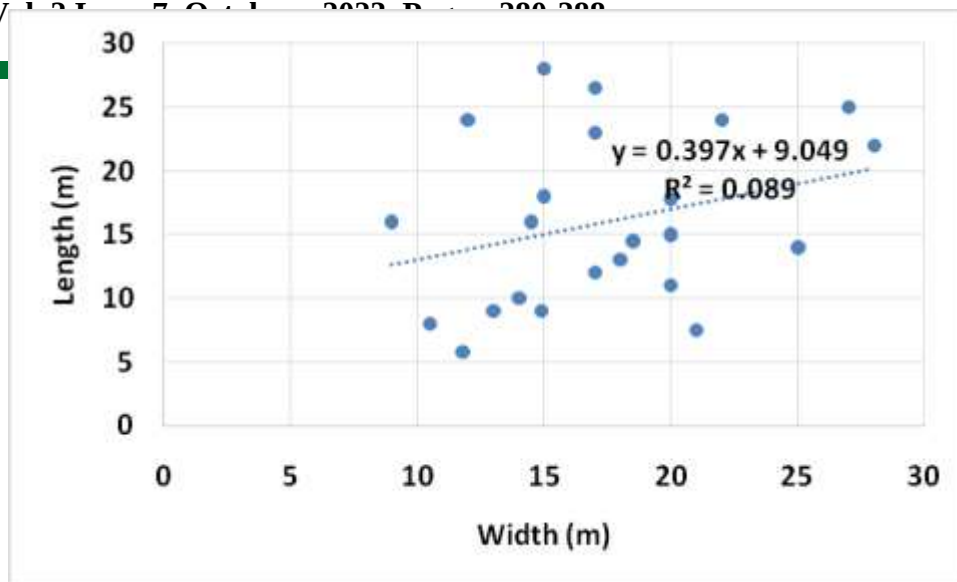


Figure2.Length and width of landslides recorded in Mubuku sub county

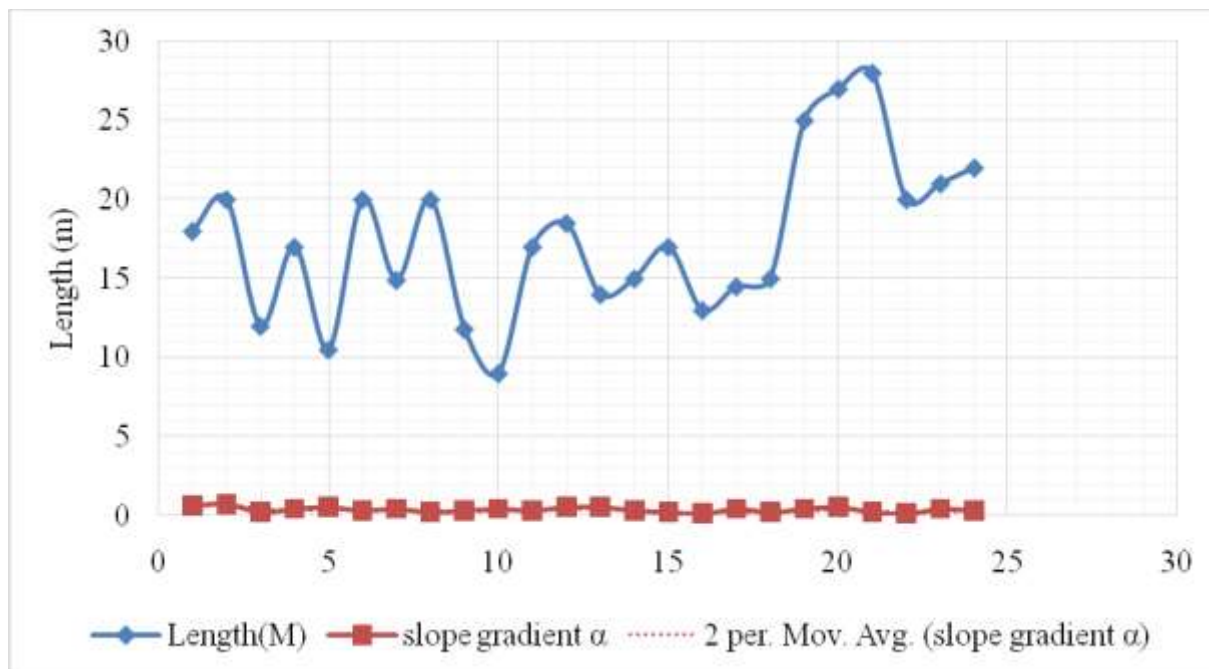


Figure 3. Relationship between length landslides and the slope of landscape in Mubuku sub county

Since the standard deviation was within the range of the maximum length and minimum length, landslide measurements are normally distributed and has a probability of 1 (Nelson et al., 2023)

Received: 13.10.2023

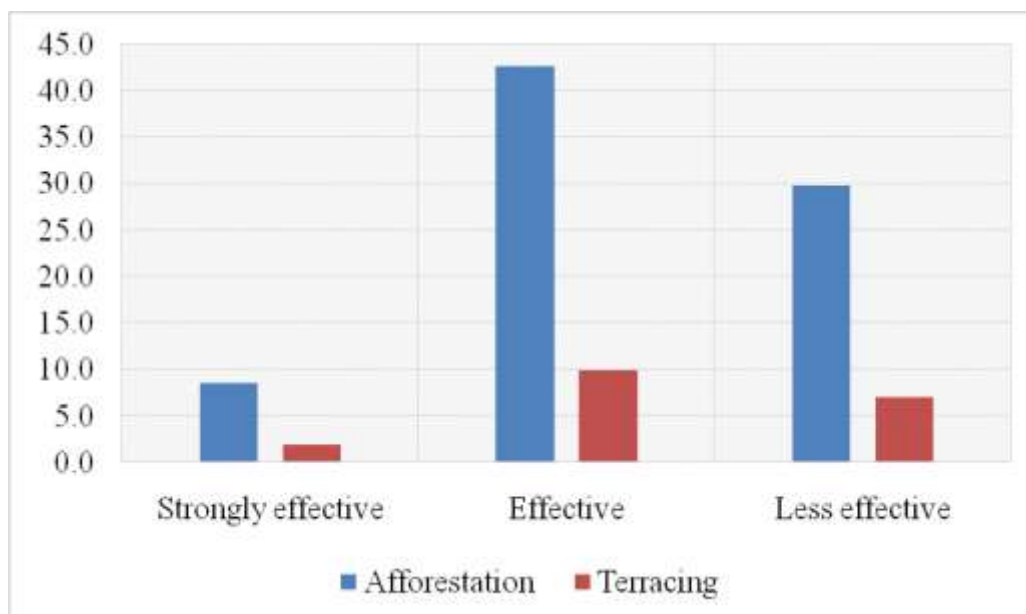
Accepted: 16.10.2023

Published on: 30.10.2023

Corresponding: Author: research.miu.ac.ug/publications

Mitigation strategies being taken by the local communities in Mubuku Sub County.**Table 3:** Response on level of effectiveness on mitigation strategies being taken.

Level of effectiveness	The Major mitigation practices used (%)		
	A forestation	Terracing	Total
<i>Strongly effective</i>	8.5	2.0	10.5
<i>Effective</i>	42.7	10.0	52.6



<i>Less effective</i>	29.9	7.0	36.8
<i>Total</i>	81.1	18.9	100.0

Figure 4: Response on perceived levels of effectiveness of mitigation strategies

The results further revealed that, a forestation and terracing are most practiced mitigation strategies in Mubuku Sub County. A total of 81.1% of respondents revealed that a forestation is the most practiced mitigation activity. However, 8.5% of these opined that it is strongly effective while 42.7% of respondents opined that the method is only effective. Also, 18.9% of respondents reported that terracing is one of the major mitigation strategies practiced in the study area, with a total of 2.0% of respondents revealing that terracing is strongly effective mitigation strategy.

Table 4: Respondents' perception of the challenges faced in mitigation of landslides

Major challenges faced in mitigation	Frequency	Percentage value
--------------------------------------	-----------	------------------

Received: 13.10.2023

Accepted: 16.10.2023

Published on: 30.10.2023

Corresponding: Author: research.miu.ac.ug/publications

<i>Tress take long to mature</i>	46.0	48.4
<i>Limited knowledge in farming practices</i>	15.0	15.8
<i>Landslides continue to happen</i>	34.0	35.8
<i>Total</i>	95.0	100.0

The results also revealed the different challenges faced associated with different mitigation practices. For example, as shown in Table 7, the majority of respondents (48.4%) revealed that trees take a longer time to mature, while 35.8% revealed that landslides continue to happen despite of mitigation measures applied.

Table 5. Organizations that support communities in Mubuku Sub County

Organizations approached for support	Frequency	Percentage value (%)
<i>E sco Uganda limited</i>	56	58.9
<i>Semuliki cooperative</i>	21	22.1
<i>Kasese local government</i>	18	18.9

However, respondents revealed that they often get support from local organizations including but not limited to Ensco Uganda limited (58.9%), Semuliki Co-operative (22.1%) and Bundibugyo Local Government (18.9%).

Conclusion

The research has identified landslides (flows, topples and complex movements) in Mubuku sub county by comparing the characteristics revealed by the respondents with Vanes (1978) and Cru den and McGraw-Hill classification of landslides. It is however important to assess landslide risk by concentrating on the understanding of the factors which trigger landslide occurrence such as lithologys, rainfall intensity, and human activities among others together with explicit studies of the landslide characteristics based on science.

Recommendation

More scientific studies should be carried out to assess the triggering factors and impacts by different types of landslides. This will provide information for building sustainable resilience mechanisms through designing the most appropriate mitigation measures.

Studies on sustainable agricultural practices such as agro-forestry, terracing among others should be done around Mubuku

Received: 13.10.2023

Accepted: 16.10.2023

Published on: 30.10.2023

Corresponding: Author: research.miu.ac.ug/publications

Sub County. These should aim at identifying and establishing the most appropriate practices to be employed by the community members to reduce on the levels of vulnerability to landslides in the area.

References

- Christopher, F. (2022). Review of Related Literature About Floods Management & Socio-Economic Development of People of Kambuga Subcounty, Kanungu District in Uganda. *International Journal of Academic Management Science Research (IJAMSR)*, 6(July), 160–164. www.ijeais.org/ijamsr
- 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.
- Francis, A., Richard, K., Kazaara, A. G., Moses, N., & Nelson, K. (2023). *Study On the Contribution of Bee Farming On the Socio- Economic Transformation of Communities in Rural Areas in Arua District a Case Study of Pajulu Sub-County*. 7(2), 1–12.
- Grace, M., Kazaara, A. G., & Kazaara, A. I. (2023). *Factors Associated With Potato Yields ' Variations In South Western Of Uganda . Case Study : Kanungu and Kisoro Districts*. 7(3), 198–205.
- Kazaara, A. G., Kazaara, A. I., & Nelson, K. (2023). *Imapcts Of Soil Erosion On Crop Productivity In Uganda A case Study Of Kibuga Division Butambala District*. 7(3), 202–212.
- Nelson, K., Christopher, F., & Milton, N. (2022). *Teach Yourself Spss and Stata*. 6(7), 84–122.
- Nelson, K., Kazaara, A. G., & Kazaara, A. I. (2023). *Teach Yourself E-Views*. 7(3), 124–145.
- 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.
- Zowena, N., Kazaara, A. G., Deus, T., & Kazaara, A. I. (2023). *Assessment Of The Effect Of Government Programs On Women Empowerment In Rural Areas . A Case Study Of Busale Sub County , Kayunga District*. 7(3), 240–247.