



# Implementation of landslide disaster risk reduction policy in Uganda



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## ABSTRACT

Globally, policies have been implemented to mitigate against disaster risks whose frequency, severity and impact is increasing. The aim of this research was to assess the extent to which landslide disaster risk reduction policy measures have been implemented in Uganda. Primary data were obtained through household surveys and key informant interviews conducted in the landslide disaster prone Mount Elgon district of Bududa in Eastern Uganda. Secondary data were collected through document review. Household survey data were analyzed using descriptive statistics and spearman's correlation tests while key informant interview data were analyzed using content analysis. The study findings reveal that afforestation, and appropriate farming technologies and land use practices are the most implemented landslide disaster risk reduction policy measures while gazettement of landslide prone areas and prohibiting settlement in such risky areas, resettlement of people living in landslide prone areas, and enforcement of relevant laws and regulations are the least implemented. The study findings further show that awareness is the most important factor influencing implementation of landslide disaster risk reduction policy measures at household level. The study findings also reveal high institutional vulnerability to landslides, characterized by inadequate financial and human capacity, political interference, misuse of resources, poor cooperation by the local community and lack of a sectoral law and this should be addressed. Future research should focus on assessing the effectiveness of early warning systems for landslide disaster risk reduction in Uganda.

## 1. Introduction

Globally, disasters are increasing in frequency, severity and impact. Between the year 2003 and 2013, the number of disaster events increased from 700 to 880 worldwide, affecting at least 2.9 billion people, killing more than 1.2 million and causing economic loss exceeding US\$1.7 trillion [1–10]. Africa holds half of the world's most risk prone countries [11]. About 1700 disaster events were recorded in Africa between 1980 and 2008, affecting more than 319 million people, killing over 708,000 and causing economic loss in excess of US\$24 billion [12]. Disasters threaten development in Africa with Uganda listed among the 11 countries most at risk of disaster induced poverty in the world [13,14]. Between the year 2000 and 2005, about 66% of households experienced at least one type of disaster in Uganda [15,16].

Landslides kill more people (14%) than any other socio-natural disaster in Uganda, and affect 4% of the population [17]. The Country has experienced enormous losses due to landslides (Table 1), including the March 1, 2010 landslide (Fig. 1) which was ranked among the top ten disasters by number of deaths in the world. The landslide killed 388

and affected at least 8500 people in the Mount Elgon District of Bududa in Eastern Uganda [12,18–23]. Such unprecedented landslide disasters can be attributed to institutional vulnerability i.e. institutions that are either too weak to offer protection against disaster risks or ignorant of their duty to provide safety and human security [24].

In response to the increasing number of disasters in the country, the government of Uganda put in place the National Policy for Disaster Preparedness and Management (NPDPM) in 2010 [25]. The NPDPM recognizes landslides as one of the major hazards in the country and recommends the following landslide disaster risk reduction measures: gazettement landslide prone areas and prohibiting settlement in such risky areas; resettling all persons living in landslide-prone areas; undertaking to promote afforestation; enforcing the relevant laws and policies; and applying appropriate farming technologies and land use practices. There has however, been no comprehensive study to assess implementation of the landslide disaster risk reduction policy measures recommended by the NPDPM. Therefore, the aim of this paper was to assess the extent to which the landslide disaster risk reduction policy measures have been implemented. The key research question was, to

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**Table 1**

Selected landslide disaster impacts for Uganda (1933–2014).

Source: DesInventar

Year	Deaths	Missing	Houses Destroyed	Affected	Relocated	Education Centers Damaged	Hospitals damaged	Crops Damaged (ha)	Roads damaged (Meters)
1933	25	0	0	0	0	0	0	0	0
1964	36	0	0	0	0	0	0	0	0
1970	120	0	0	0	0	0	0	0	0
1997	100	0	97	0	0	0	0	0	0
1998	5	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	17	0	224	582	0	15	0	236	0
2010	1310	600	6	305677	50	4	1	41	0
2011	3	0	4	0	0	0	0	0	4080
2012	8	0	0	735	0	0	0	0	0
2013	1	0	21	117	0	0	0	0	0
2014	1	0	0	1680	0	0	0	0	0
<b>TOTAL</b>	<b>1626</b>	<b>600</b>	<b>352</b>	<b>308791</b>	<b>50</b>	<b>19</b>	<b>1</b>	<b>277</b>	<b>4080</b>

what extent have the landslide disaster risk reduction measures recommended by the NDPDM been implemented? The findings of the study will inform future implementation of the NDPDM.

## 2. Methodology

### 2.1. Study setting

Bududa district is located on the south western slopes of Mount Elgon in Eastern Uganda along the Kenya boarder (Fig. 2). The district lies between latitude 2° 49'N and 2° 55'N, and longitude 34° 15'E and 34° 34'E. It covers a total land area of about 274 km<sup>2</sup>. The study area receives very high annual rainfall (above 1500 mm), is characterized by high altitude ranging between 1250 m to 2850 m above sea level, and the steep concave north-east facing slopes that coincide with the dominant rainfall direction have favoured land sliding. With exception of the Central Bukigai zone, the study area is dominated by vertisols which are “problem soils” i.e. where slope failure can occur even without human intervention. The soils have a high amount of clay, are fine textured and highly plastic, resulting in low permeability, excessive water retention, high susceptibility to expansion and sliding. The most common types of landslides in the study area include; debris slumps, bottle slides, mudslides and sheet slides [26–36].

Bududa is a highly populated and predominantly rural district

(97%). Between 2002 and 2014, the population grew by 72% (Author, 2016) from 123,103 to 211,683. The population is largely distributed among households 37,028, with an average household size of 5.7 far above the national average of 4.7. The annual population growth rate is very high (4.52%), far above the national average of 3%. The population density is also very high (499 persons per km<sup>2</sup>) compared to the national average of 173. The population is relatively homogeneous and traditional with a predominant household population of 99%, and the Bagisu or Bamasaba constitute the major ethnic group (99%). The largely traditional nature of the population makes it conservative and less willing to accept birth control programmes or relocate to other areas. Although Mount Elgon national park covers 40% of the district, the fertile volcanic soils support intensive subsistence farming and a high population density. Both rapid population growth and intensive agriculture are key drivers of landslides in the study area. In terms of administrative units, Bududa district has one town council, 15 sub-counties, 36 parishes and 336 villages [27,28,32,37–39].

### 2.2. Research design

The study used a survey design since the aim of the researcher was to describe and explain events as they are. Such a design enabled extensive and rapid data collection, and understanding of the study population from part of it [40,41]. The study used a mixed method



Source: Wanasolo, 2012

**Fig. 1.** The March 1, 2010 landslide disaster in Nametsi village, Bududa District. Source: [23].

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