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The catastrophic geomorphological processes in humid tropical Africa: A case study of the recent landslide disasters in Cameroon

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Abstract

A retrospective analysis of data from the last three decades, clearly indicates an upward trend in the number of landslides and mudflows in Cameroon. Their impact on human beings, environment and properties has increased considerably. For example, since June 2001, several cases have been recorded, among which two resulted in significant human losses: twenty three deaths in June 2001 in Limbe town, twenty five others in July 2003 at Magha and its surroundings in the Bamboutos Mountains.

These last two events were really spectacular and may be sounding the alarm of a geomorphological crisis in the region. According to each case, several tens or hundreds of landslides of different types and magnitudes occurred within a few minutes or hours, extending over an area of several tens of square kilometres. The reasons for this catastrophic evolution in the geomorphological processes in Cameroon are natural and anthropogenic.

Among others, the natural factors are the changing climatic conditions, with the occurrence of very exceptional rainfalls and the uneven topography of the affected zones, for example with very steep slopes, as in the Magha zone of which area about fifty percent is above twenty degrees.

The anthropogenic factors are also very relevant, with the increasing human pressure on the environment, characterised by the extension and/or intensification of the agro-pastoral activities (in the rural areas) and the anarchical settlement on the sloping urban zones.

Keywords: Environment; Landslides; Mudflows; Disaster; Geomorphological processes; Climatic conditions; Human pressure

1. Introduction

Located at the interior of the Gulf of Guinea, Cameroon extends from latitudes 2° to 13° North and longitudes 9° to 16° East (Fig. 1). Better known as Africa in miniature, this country is characterised by the large diversity of its natural setting: relief, climate, vegetation, soils and geology etc.

Within the last three decades, Cameroon has experienced a number of catastrophic mass movements. These include rock fall, landslides and mudflows, both in the rural and urban areas. Examples of these events in urban areas occurred in 1978 at Dschang (Tchoua, 1983), in 1989, 1992, 1996, and 2001 at Limbe (Zogning, 1994; Zogning et al., 2003), 1978, 1985, 1986, 1990 and 1998 at Yaoundé in 1998 at Nkongsamba, and in 2003 at Poli amongst others. In rural areas they were registered at Fossong Wetcheng in the Dschang area in 1987, Pinyin in 1991, Bafaka in 1993 (MINAT/PNUD, 1999), Melong area in 1986, Kribi in

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Fig. 1. Location map of Cameroon in Africa. (From Laclavere, 1979)

1987, Awae in 1998, Nwa in 2000 and Wabane (Magha and its neighbourhood) in 2003.

In many cases, these events have caused enormous damage, notably on human lives, houses, agriculture, equipment and different infrastructures.

A retrospective survey of this phenomenon indicates a net increase in their occurrence and magnitude. These are not only more and more frequent, but also increasingly severe in terms of their extent and the damage caused. One can therefore raise the following questions: why is there an upsurge in the occurrence and magnitude of land mass movements in Cameroon?

2. An overview of catastrophic mass movements in Cameroon within the last three decades

In the course of the last three decades, precisely from 1978, about thirty known catastrophic landslides have been recorded in Cameroon, leading to the loss of some 128 human lives. This figure may appear less significant when compared to that from other calamities like AIDS, malaria, or traffic accidents that plague the African continent as a whole. When one however includes the immense damage caused in material form, often associated with these movements, and above all, the net increase in the phenomenon, this therefore becomes a real matter of concern.

2.1. Frequency and trend of the phenomenon

An analysis of the frequency and magnitude of landslides and mudflows in Cameroon makes it obvious that the phenomenon is on a net increase.

A total of seven known landslides were recorded during the 1978–1987 decade. From 1988 to 1997, the number recorded almost doubled, with twelve more cases reported. From 1998 to 2003, in only six years, seven