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RAINFALL INFLUENCE ON LANDSLIDE DYNAMICS (CARPATHIAN FLYSCH AREA, Romania) (**)

ABSTRACT: SURDEANU V., RUS I., IRIMUS I.A., PETREA D. & COCEAN P.,
Rainfall Influence on Landslide Dynamics (Carpathian Flysch Area, Romania). (IT ISSN 0391-9838, 2009).

This study brings forward two important aspects concerning landslides that have an important role in the contemporary morphogenesis of the hilly and mountainous areas in Romania.

The first topic refers to the recurrence of the landslides reactivation. The existing works proved that the starting point and the recurrence of landslides are mainly connected with the climatic periodicity, especially with the pluviometric surplus. For the mountainous flysch area, the periods with surplus of precipitation were recorded between 1912-1913, 1941-1943, 1970-1972, 2000-2005. Recent field studies, during the last two periods, show (on the background of a natural vulnerability) an extension of the area affected by active landslides.

The second aspect that was taken into account is connected with the implications of the meteoric water on the landslide dynamics. In order to emphasize this relationship, the analysis was based on the measurements of the rainfall regime, moisture of the slope deposits as well as the landslide dynamics made in two experimental catchments. In order to measure the landslides dynamics, repeated topographical and inclinometric measurements were taken. The research was carried out over two years so as to identify the influence of the precipitation on two types of superficial deposits affected by active landslides.

The investigations helped us reach the conclusion that the daily precipitation influences the moisture of the slope deposits only up to a depth of 50-60 cm. Between the date when the rain occurs and that when the landslides are accelerated, there is a difference of 10-15 days according to the infiltration rate which depends on the grain size of the deposits and their degree of disintegration.

KEY WORDS: Precipitation, Slope deposits, Natural humidity, Landslide dynamics, Eastern Carpathians, Romania.

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(**) 12th Belgium-France-Italy-Romania Geomorphological Meeting - IAG «Climatic change and related landscapes» (Savona, 26-29 September 2007).

INTRODUCTION

Among the factors that determine the genesis and maintenance in a dynamic state of the landslides, most of the researchers point out the role of the precipitation (Tufescu, 1966; Flageollet, 1989; Panizza, 1995). If some of the authors explain the mechanisms through which the landslides take place in the presence of water and under its influence, in most of the cases it is not explained “how” and “when” water interferes in the landslide dynamics. Therefore, our aim, based on field experiments, is to elucidate some of the aspects connected with precipitation and the landslide dynamics.

Our research was carried out beginning with 1970 till present days in the Eastern Carpathians (the flysch area) and was aimed to point out the extension of the active landslides, the triggering factors that led to the reactivation of the previous surfaces affected by landslides over time and their impact on the local economy (fig. 1).

Ranging in longitudinal strips from north to south, with widths that exceed 100km in the southern part, the flysch formation consists of lithological entities with ages beginning with the Cretaceous up to the Neozoic, represented by rhythmical alternations of marls, clays, sandstones, marly- limestones and aggregations (Bancila, 1958).

The Bistrita valley represented the main focus of our research as it crosses, from north-west to south-east, all the morpho-lithological units of the above mentioned mountains, having a roughly transversal direction in its middle part.

Beginning with the 1950s, the Bistrita valley has been highly transformed due to the hydro-energetical constructions that have been developed here. Five reservoirs have been built so far. Under these circumstances, some direct impacts could be identified, such as: village removal, road