

Odivelas - Vialonga cuestras, and the formation of large depressions, like Arruda dos Vinhos and Loures basins.

In this area, we can identify active sheet-wash, rill-wash and rockfalls processes; nevertheless, the landslides have the most important role in the actual slope evolution. The geomorphological mapping at a very large scale, already performed, by one of us (J.L.ZÉZERE,1988) at Lousa -Bucelas cuesta (fig.3), identify the locations of mass movements and evaluate the natural hazards, important in this area subjected to an irregular urban growth.

3. MASS MOVEMENTS AND OTHER EROSIONAL PROCESSES.

3.1. PASSIVE AND ACTIVE FACTORS.

Mass movements are the result of slope instability passive and active factors. In the passive factors we can include lithology, structure, topography and geomorphological heritages. In fact, the presence of clays and marls, with plastic behavior, or the alternation between permeable and impermeable layers or, even, clayish superficial deposits, contribute to slope instability. These conditions added to bedding planes concordant with slope, declivity higher than 5° and the presence of old landslides, represent the major favourable situations for mass movements processes.

Among the active factors we can point out the anthropic activity and the rainfall regime. The human activity, creating changes on slope gradient, degradation of vegetal cover, occupation of flood plains and changes on river beds, is one of triggering conditions in slope instability. On the other hand, through the researches carried on by A.B.FERREIRA (1984) and A.B.FERREIRA, J.L.ZÉZERE and M.L.RODRIGUES (1987), in the north of Lisbon, is possible to point out two different situations about climatological factors : torrential showers concentrated on few hours (November 1967, fig.4A, or even November 1984, fig.4C), produce catastrophic flash floods in small valleys (with undercutting of river banks and foot of slopes), induce small sheet slides, rockfalls, rill and gully erosion and multiple earth slides; long rainy periods, during the cold season (February 1979, fig.4B), induce flood plain inundations in the large valleys, the development of translational and complex slides and strong soil degradation, namely by laminar erosion.

This winter we lived also, in November and December 1989 (fig.4D), persistent and heavy precipitations, that in several cases overtake the annual average. Though its character are similar to February 1979, it seems to have, sometimes, mixed characteristics, partly due to its exceptional persistence.

3.2. EXAMPLES.

The case studies although involving restricted areas, present a wide range of mass movements and other erosional processes which inhibit its presentation in this paper. So we choose some examples trying to include several sorts of mass movements, the most frequent ones and, at the same time, those which are responsible for the lion's share in the economic and social damages.