



## **Land use and landslide activity in the Rocchetta San Antonio area (Daunia region, Italy)**

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We use a series of historical and recent orthorectified airphotos as well as satellite imagery to investigate the influence of land use (and land cover) changes on the variations in the landslide activity occurred in the last three decades in the municipal territory of Rocchetta Sant'Antonio (Daunia region, southern Italy). This predominantly rural area is known for recurrent landslide problems and there is evidence that landsliding has increased in recent years. Although quantitative studies are lacking, a currently popular view is that the climate change is to be blamed. The region, however, has experienced considerable changes in agriculture and farming practices in the last decades. In an attempt to reveal the effects of agricultural and land use changes on local slope instability, we examine the temporal series of landslide frequency and land use maps. Our results show that the land-use changes in the last 30 years correlate well with the increase in landslide activity in Daunia. In particular, the comparison of the 1976 and 2006 landslide inventories shows the increases in aerial frequency of active landslides of nearly 50%. In the same period the most pronounced variation in land use involved the sown fields, whose percentage (in terms of areal frequency) has increased from about 53 to 72%. Furthermore, the results demonstrate that the current (2006) high density (5.2%) of active landslides in the areas that have become sown after 1976 can be linked to the originally high susceptibility of those areas to landsliding (3.1%), exceeding even the areal frequency of failures in fields already sown in 1976 (2.0%). It is thus likely that the new agricultural activities involving deep ploughing have altered the mechanical properties of soils and further increased the susceptibility of the slopes to landsliding. Acknowledgements We thank the municipal administration of Rocchetta S. Antonio and in particular Dott. A. Magnotta, providing some of the data used in this study. We are also grateful to Dott. G. Rampino for his support.