Geomorphological analysis of Liro and Livo catchment basins in Northern Como Lake (Italy)

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Liro and Livo are two catchment basins located in the Northern Como Lake and they are characterized by several landslides. A geomorphological analysis of them occurred to understand the potential instability of the zone. The purposes of our studies are to produce cartographic documents on slope processes around Como Lake for risk assessment and to produce data sets that can be useful to understand slope dynamics. The geological and structural setting shows that in the study area land sliding affects weathered bedrock and non-cohesive surficial deposits. A selected number of such processes has been classified in two types: debris flows and rock avalanches. Rock avalanches are developed in steep slope conditions and they are characterized by a single event that involves solid material, water being negligible. In Liro and Livo catchment basins rock avalanches involve coarse grained soil, made from a combination of surficial deposits, rock fragments and vegetation. Debris flows are landslides in which high pore water pressures, typically following intense rainfall, cause the soil and weathered rock to rapidly lose strength and flow downslope. They commonly begin as a slide of a shallow mass of soil and weathered rock and they are especially sensitive to changes in water conditions in slopes. Precise mapping of individual landslides together with structural indications are analyzed and the possibility for rock degradation and cover variation instability to trigger slope processes is discussed. A cumulative frequency-area distribution of landslides is derived and its power law shape discussed.