# Assessing population exposure for landslide risk analysis using dasymetric cartography

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Exposed Population is a major topic that needs to be taken into account in a full landslide risk analysis. Usually, risk analysis is based on an accounting of inhabitants number or inhabitants density, applied over statistical or administrative terrain units, such as NUTS or parishes. However, this kind of approach may skew the obtained results underestimating the importance of population, mainly in territorial units with predominance of rural occupation. Furthermore, the landslide susceptibility scores calculated for each terrain unit are frequently more detailed and accurate than the location of the exposed population inside each territorial unit based on Census data. These drawbacks are not the ideal setting when landslide risk analysis is performed for urban management and emergency planning. Dasymetric cartography, which uses a parameter or set of parameters to restrict the spatial distribution of a particular phenomenon, is a methodology that may help to enhance the resolution of Census data and therefore to give a more realistic representation of the population distribution.

Therefore, this work aims to map and to compare the population distribution based on a traditional approach (population per administrative terrain units) and based on dasymetric cartography (population by building). The study is developed in the Region North of Lisbon using 2011 population data and following three main steps: i) the landslide susceptibility assessment based on statistical models independently validated; ii) the evaluation of population distribution (absolute and density) for different administrative territorial units (Parishes and BGRI – the basic statistical unit in the Portuguese Census); and iii) the dasymetric population's cartography based on building areal weighting.

Preliminary results show that in sparsely populated administrative units, population density differs more than two times depending on the application of the traditional approach or the dasymetric cartography.