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Landslide Susceptibility Mapping: A Comparison between Logistic Regression and Multivariate Adaptive Regression Spline Models in the Municipality of Oudka, Northern of Morocco

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Abstract : The logistic regression (LR) and multivariate adaptive regression spline (MarSpline) are applied and verified for analysis of landslide susceptibility map in Oudka, Morocco, using geographical information system. From spatial database containing data such as landslide mapping, topography, soil, hydrology and lithology, the eight factors related to landslides such as elevation, slope, aspect, distance to streams, distance to road, distance to faults, lithology map and Normalized Difference Vegetation Index (NDVI) were calculated or extracted. Using these factors, landslide susceptibility indexes were calculated by the two mentioned methods. Before the calculation, this database was divided into two parts, the first for the formation of the model and the second for the validation. The results of the landslide susceptibility analysis were verified using success and prediction rates to evaluate the quality of these probabilistic models. The result of this verification was that the MarSpline model is the best model with a success rate (AUC = 0.963) and a prediction rate (AUC = 0.951) higher than the LR model (success rate AUC = 0.918, rate prediction AUC = 0.901).

Keywords : landslide susceptibility mapping, regression logistic, multivariate adaptive regression spline, Oudka, Taounate
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