



Impact of large slope movements on the construction of a major highway in the Constantine Province, North-East Algeria

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All over northern Algeria, mass movements represent a major hazard and frequently impact on infrastructure, causing significant losses.

This paper presents first results of the analysis of slope instabilities along a highway under construction in the Tafrent Region, Constantine Province. They show that many different types of failures characterized by a high degree of heterogeneity affect the road works. Some appear as clear landslides, others develop as diffuse movements in zones previously classified as stable areas. Most of the recent slope movements were triggered during the road works involving extensive removal of rock and soil masses. Some instabilities initiated within paleo-landslides and now affect entire mountain slopes larger than 50 ha. Due their large size (with a volume reaching more than 10^6 m³) it is likely that remediation measures will be very costly. Therefore, it is necessary to assess the full impact potential of these slope instabilities.

First, we started to make the inventory of all slope instabilities within a large corridor along the highway. Second, detailed geomorphologic and structural geology analyses using remote sensing (based on aerial photographs and SPOT imagery) and field observations are performed. Third, many geotechnical tests complemented by sedimentological analyses provide valuable data on the geomechanic behaviour of the soils that are mainly made of weathered marls and often exhibit viscous types of movements that affect the entire unstable mass.

The specific target of our work is to answer the following questions: how much did the road works modify the natural state of stability, could the reactivation of paleo-landslides be predicted, might it have been prevented and, finally, can further slope movements be predicted – and, thus, their impacts prevented?

The development of a robust methodology based on remote sensing, field observations and geotechnical-geophysical investigations is the general goal of our research. This methodology could then be applied to other regions since the need for assessing landslide hazards is very high all over the mountainous areas of Northern Algeria.