



Deep seated gravitational slope deformation and hydraulic vulnerability of the low Biferno valley (Southern Italy)

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Geological and geomorphologic features of low Biferno valley are affected by a deep seated gravitational slope deformation produced by the orogenesis of Apennines with a fulcrum located next to confluence with Cigno's stream. As a consequence of this deep deformation the low river Biferno valley is particularly vulnerable to alluvial phenomena.

The work provides an analysis of this deep gravitative deformation that characterizes the examined zone: the interpretation of a Digital Elevation Model and some geological sections (produced with the aid of Geographical Information System) has shown as both basin's morphology and plano-altimetric variation of Biferno river have been affected by this phenomenon. The aim is a description of the DSGSD and the consequences on morphology of the basin and on the Biferno's course.

The tectonic action has compressed and fractured this area, which is afterwards collapsed by means of a deep slide with a rupture surface probably at the interface between blue-gray clays and clayey sands. The deformation is attested by a great scarp, in which Cigno stream positioned itself at the toe, by the collapse of the zone between streams and by the features of plano-altimetric pattern of Biferno river. Biferno has to deviate its course: in order to cross the obstacle characterized by the toe of the deep slide, the river shifts from the right riverside to the left and causes erosional processes and consequent landslide. After the confluence with Cigno stream, the river has to regain energy and makes a meandering path.

In this new configuration, floods can hardly get canalized in this meanders and naturally come out from the bed of ordinary flow, invading a wide zone of the valley. Then, it emerges as the presence of deep seated gravitational slope deformation could constitute an aggravating element for the vulnerability of the territory and predisposes the zone to alluvial phenomena and landslides.