

Features of gravitational rock deformation in Mizunesawa Basin, the upper reach of the Tama River, west Tokyo

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We describe the geology and geomorphology related to gravitational rock deformation (mass rock creep) in Mizunesawa Basin (MB), the upper reach of Tama River. MB is surrounded by several peaks ranging from ca.1000 m to ca.1600 m ASL, and the azimuth of the main course of MB displays NW-SE direction. The bedrock geology of MB mainly consists of Cretaceous sedimentary rocks of Shimanto Group that generally show NW-SE strike and east dip at 60 to 80 degrees.

Ridge-top linear depressions and antiscarps parallel to the main ridge are present. Depth and length of depressions are usually less than 10 m and up to 450 m, respectively. Features of valley bulging with minor antiscarps and gentle slopes are also found from valley side slopes immediately below ridge-top depressions and antiscarps. On the valley side slopes where bulging features occur, rock deformation caused by toppling can be observed. Although the features of gravitational rock deformation are well developed in MB, accumulation terraces or natural dams are not found at all. This fact requires further consideration about long-term geomorphic development in MB related to middle to large landslides affected by rock deformation.

Keywords: linear depression, antiscarp, mass rock creep, toppling, dip slope vs. scarp slope