



3D Virtual Reality Applied in Tectonic Geomorphic Study of the Gombori Range of Greater Caucasus Mountains

Lasha Sukhishvili (1) and Zurab Javakhishvili (2)

(1) Ilia State University, Institute of Earth Sciences, Department of Geography, Tbilisi, Georgia (lasha.sukhishvili@iliauni.edu.ge), (2) Ilia State University, Institute of Earth Sciences, Tbilisi, Georgia (zurab_javakhishvili@iliauni.edu.ge)

Gombori Range represents the southern part of the young Greater Caucasus Mountains and stretches from NW to SE. The range separates Alazani and Iori basins within the eastern Georgian province of Kakheti. The active phase of Caucasian orogeny started in the Pliocene, but according to alluvial sediments of Gombori range (mapped in the Soviet geologic map), we observe its uplift process to be Quaternary event. The highest peak of the Gombori range has an absolute elevation of 1991 m, while its neighboring Alazani valley gains only 400 m. We assume the range has a very fast uplift rate and it could trigger streams flow direction course reverse in Quaternary.

To check this preliminary assumptions we are going to use a tectonic and fluvial geomorphic and stratigraphic approaches including paleocurrent analyses and various affordable absolute dating techniques to detect the evidence of river course reverses and date them. For these purposes we have selected river Turdo outcrop. The river itself flows northwards from the Gombori range and nearby region's main city of Telavi generates 30-40 m high continuous outcrop along 1 km section. Turdo outcrop has very steep walls and requires special climbing skills to work on it.

The goal of this particularly study is to avoid time and resource consuming ground survey process of this steep, high and wide outcrop and test 3D aerial and ground base photogrammetric modelling and analyzing approaches in initial stage of the tectonic geomorphic study. Using this type of remote sensing and virtual lab analyses of 3D outcrop model, we roughly delineated stratigraphic layers, selected exact locations for applying various research techniques and planned safe and suitable climbing routes for getting to the investigation sites.