

Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 20/1	Graz 2014
PANGEO AUSTRIA 2014	Graz, 14. September 2014 – 19. September 2014		

Land degradation in Madagascar: Beliefs and facts

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The study of land degradation in Madagascar is very important due to severe gully formation termed as lavakization. Lavakas are very abundant in the island and therefore have been subject of many studies in the past 60 years. Nevertheless many questions still remain concerning their formation and development.

The aim of this study was to assemble and review earlier lavaka researches to understand why these lead to limited success. Exact location of the field surveys, cited triggering factors and results of these scientific papers have been studied in detail. It seems that earlier lavaka researches have been restricted to the middle part of the Malagasy Highland because of the limited feasibility of field surveys. Furthermore, although lithology and climatic conditions are mentioned as key factors, their effect on lavaka density and characteristics have not been revealed in details yet.

Remote sensing and GIS methods have been used in 12 semi-random study areas (around 256 km² each) in order to quantify and characterize lavakas and study the correlation between their density and the different contributing factors such as the topography, vegetation, climate, geology, lithology and the possible human influence. Results for 7610 lavakas in 3090 km² showed that lavaka density, size and shape varies greatly, even locally. Gully abundance maps indicate strong correlation between lavaka distribution, elevation, slope angle, vegetation cover. Lavakas were found in the eastern part of the country at lower topographic levels, gentle slopes and sandy sediments notwithstanding with the fact that previous studies emphasized the importance of elevated topography, steep slope and lateritic soils as preconditions in lavakization.

This is ILARG-contribution Nr. 14.