



## **Afro-alpine forest cover change on Mt. Guna (Ethiopia)**

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High mountain forests, such as the afro-alpine *Erica arborea* L. forests in Ethiopia, are very important for the livelihood of local communities, in relation to their impacts on the water balance of mountain ecosystems and surrounding agricultural areas. On volcanoes, the dominance of volcanic tuffs on the slopes, as well as that of gelifractions near the top further enhances infiltration, making it recharge areas. Earlier forest cover change studies in the Ethiopian highlands mainly deal with the lower vegetation belts. In this study, 3.37 km<sup>2</sup> on the western slopes of Mount Guna (one of the dozens of Miocene shield volcanoes that exist on top of the Ethiopian plateau) was mapped. The slope has an elevation between 3200 at its base and 4113 m a.s.l. at the peak. The present forest cover was recorded from high-resolution georeferenced satellite imagery from Google Maps and field data (2015), while historical forest cover was studied from georeferenced aerial photographs of 1982. In addition, key informant interviews were conducted to identify the trend of forest cover change and management practices. Whereas burning of the *Erica* forest for sake of land clearance (a typical practice on all Ethiopian mountains until the 1980s) most strikingly took place for three consecutive days in 1975, large-scale deforestation resulting from agricultural expansion and livestock pressure continued thereafter. However, between 2000 and 2014, due to active involvement of local and governmental institutions there was a slight regeneration of the vegetation and the *Erica* forest. Protection and regeneration of the forest was particularly efficient after it was given into custody of an orthodox church established in 1999 at the lower side of the forest. Overall, the study revealed that human and livestock pressures are the strongest drivers of deforestation. Furthermore, the study indicated that integrating the actions of local and governmental institutions is key for the protection of the afro-alpine vegetation on the other parts of Mt. Guna.