

Analysing land cover and land use change in the Ruma National Park and surroundings in Kenya

Valeska Scharsich (1,2), Dennis Ochuodho Otieno (3), and Christina Bogner (1)

(1) University of Bayreuth, Ecological Modelling, Bayreuth, Germany , (2) University of Bayreuth, Soil Physics Group, BayCEER, Bayreuth, Germany, (3) Jaramogi Oginga Odinga University of Science and Technology, Bondo, Kenya

The change of land use and land cover (LULC) is often driven by the growth of human population. In the Lambwe valley, Kenya, the most important reason for accelerated settlement in the last decades was the control of the tsetse fly, the biological vector of trypanosomes. Since the huge efforts of tsetse control in the 1970s, the population of the Lambwe valley in Kenya increased rapidly and therefore the cultivated area expanded. This amplified the pressure on the forested areas at higher elevations and the Ruma National Park which occupies one third of the Lambwe valley. Here, we investigate possible effects of this pressure on the land cover in the Lambwe valley and in particular in the Ruma National Park.

To answer this question, we analysed the surface reflectance of three Landsat images of Ruma National Park and its surroundings from 1984, 2002 and 2014. To compensate for the lack of ground data we inferred past land use and land cover from recent observations combining Google Earth images and change detection. By supervised classification with Random Forests, we identified four land use and land cover types, namely the *forest* dominant at the high elevation; *dense shrub land*; *savanna*; and *sparsely covered soil* including bare light soils with little vegetation, fields and settlements. Subsequently, we compared the three classifications and identified LULC changes that occurred between 1984 and 2014.

We observed an increase of agricultural area in the western part of the Lambwe valley, where high elevation vegetation was dominant. This goes hand in hand with farming on higher slopes and a decrease of *forest*. In the National Park itself the *savanna* increased by about 8% and the proportion of *sparsely covered soil* decreased by about 10%. This might be due to the fire management in the park and the recovering of burned areas.