



Land-use induced dynamics of C, N and P in mountain soils of South Ecuador

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The mountain rainforest region in South Ecuador is characterised by sites subjected to forest clearing by slash burn for pasture production. Repeated burning of pastures is a common management practice in South Ecuador. With ongoing pasture age bracken (*Pteridium arachnoideum*) outcompetes the pasture grass (*Setaria sphacelata*), pastures are abandoned and a vegetation succession develops. Along a land-use gradient (natural forest, young and old pasture, abandoned pasture with successional vegetation) the dynamics of C, N and P in the mountain soils were investigated.

The study sites were located close to the “Estacion Científica San Francisco”, about halfway between the province capitals Loja and Zamora, in the Cordillera Real, an eastern range of the South Ecuadorian Andes at about 2000 m above sea level. The mean annual air temperature is 15.3°C with an average annual rainfall of 2176 mm.

The land-use change induced an increase of total P in the top soil (0-30 cm) of young and old pastures. An increase in SOC stocks in the top soil of the old pasture was combined with an increase in the proportion of NaOH extractable organic P. In the young pasture soil the mineralization of SOC and the amounts of microbial biomass C, N and P were highest. In 0-5 cm depth gross N mineralization and gross NH₄ consumption rates were significantly higher in the young pasture compared to forest and abandoned pasture. Thus, the initial increase in microbial activity after forest to pasture conversion seems to slow down with increasing pasture age. Burning on the abandoned pasture site induced a short-term and short-lived increase in gross N mineralization rates. First results indicate that the land-use induced changes in mineralization rates were connected with changes in the microbial community structure.