



Palyno-ecological reconstruction of the impact of historical land use on soil erosion and colluviation in the basin of Brouch, Luxembourg.

Jan van Mourik, Ruud Slotboom, and Hubert Mettievier Meijer

University of Amsterdam, Biodiversity and Ecosystem Dynamics (IBED), Amsterdam, Netherlands (j.m.vanmourik@uva.nl)

The distribution in a complete soil catena in the basin of Brouch (Luxembourg) of stable soils (podzols and luvisols), truncated soils, colluvic regosols and terric histosols reflects the impact of historical land use on the hydrology, (accelerated) soil erosion and colluviation.

The sediment core of the histosols in the basin of Brouch shows input of sandy and loamy material (most probably transported by small creeks and short living rills) in the Preboreal (before the development of the deciduous forest), in the beginning of the Subboreal (due to climatic change, especially the decrease of evapotranspiration) and in the Roman younger cultural Times. The pollen diagram of the histosol, sampled in the central part of the basin, reflects clearly the Subatlantic anthropogenic deforestation and land reclamation. The earliest palynological evidence of deforestation originates from Roman Time. After a short period of recovering, the deforestation continued in the Middle Ages.

The deforestation affected landscape hydrology. In deforested higher parts of the landscape, soil water infiltration increases and causes soil wetting in depressions and valleys; consequently, the diagram of the histosol points to accelerated peat accumulation after the start of the deforestation. Especially the crop production on arable land promotes soil erosion and colluviation. The clastic lamina in the peat profile are most probably the result of transport of eroded soil in short living rills in the slopes, ending in the peat bog.

The (flat) higher parts of the landscape are characterized by not truncated soils, the upslope areas by truncated soils, the downslope part by colluvial soils. The palynological age of the colluvial deposits is Subatlantic. That allows the interpretation that the colluvic regosols developed after the start of deforestation and the introduction