AN EXPERIMENTAL USE OF SLASH-AND-BURN CULTIVATION IN KARULA NATIONAL PARK, ESTONIA

Kersti Kihno [1]; Liisi Jääts [2, 3]; Marge Konsa[3]; Pille Tomson[4, 5]

[1] University of Tallinn, [2] Estonia National Museum, [3] University of Tartu, [4] Estonian University of Life Sciences, [5] Valga Museum

Slash-and-burn, also known as swidden cultivation means a clearing of forest for agriculture by cutting and burning the vegetation. Plots are cultivated for a few seasons and then abandoned as fertility declines. Such plots become used as pastures, later forest recovers. Swidden cultivation has played an important role in land use for about 4000 years in Estonia. It survived the longest, up to early 20th century, in Eastern and South-Eastern Estonia. As all traditional cultivation systems, slash-and-burn has also shaped the modern landscapes but the impacts are still unexamined.

Karula National Park has been chosen as the slash-and-burn experiment site. In this region of extensive forests and the traditional settlement pattern of single farms swidden cultivation has historically been an important land-use strategy. To study the impacts of slash-and-burn cultivation the interdisciplinary approach is essential.The experimental sites will serve as base for long-term research as some developments relevant from the viewpoint of historic land-use as well as that of environmental effects occur on the site 10-20 years after the end of cultivation.

The project objective is to study:

- the impact of burning practices and slash-and-burn cultivation methods on soil and vegetation;
- the dynamics of crop yields during the years;
- vegetation regeneration after cultivation, that enables to draw conclusions about the impact of slash-and-burn cultivation on formation of plant communities;
- how slash-and-burn cultivation and the subsequent changes of vegetation show in pollen spectra;
- atmospheric transportation capacity of microscopic charcoal particles, used in palaeoecological reconstructions;
- the specific structure of soil and burning remnants, that will serve as comparative material for archaeological interpreting of ancient swidden fields;
- the technology, tools and amount of workforce in traditional swidden cultivation.

Activities and analyses in the experimental fields

The experimental plots have been burned and seeded with rye in traditional way in 2006, 2007 and 2009. Archaeological inspection has been carried out on the chosen sites. Soil analyses and vegetation mapping have been completed in the fields I and II prior burning to get background material for the forthcoming studies. The effect of burning was analysed using the soil samples: the first taken immediately after burning and the second two months later and the soil temperature was measured during the burning process. To study atmospheric transportation of microscopic charcoal particles during burning and ploughing glycerol jelly covered glass plates were used.