

Land use effect on carbon accumulation in ecosystems from the region of Central Stara Planina mountain

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Summary

Forest ecosystems in Bulgaria are mainly located in the mountainous regions of the country. These ecosystems provide essential ecosystem services. Carbon accumulation is a prime function of mountain forest ecosystems, which is sensitive to changes. The components of mountain ecosystems – the essential carbon pools - are aboveground biomass, dead organic matter (including forest floor, dead wood and turf/sward), soil and underground biomass. The efficiency of the carbon accumulation process in the main ecosystem pools depends to a large extent on the planned forestry practices.

The aim of the present study is to investigate the impact of land use, land use change and different management on carbon accumulation in essential carbon pools of the mountain ecosystems in the region of Central Stara Planina mountain.

To achieve this goal in 2013, 8 / eight / experimental sample plots were selected, which are representative of the region and assured with data. Established methods for sampling and analysis of collected samples from the main components of ecosystems are applied. Through laboratory analysis and calculations, the main characteristics of the studied ecosystem components are determined in order to obtain reliable and relevant information for discussing the issues pointed in this thesis, in its scientific completeness.

As a result of the current scientific research, contemporary and recent information on the impact of changes in land use and forest management on carbon accumulation in principal components of mountain ecosystems and on the qualitative and quantitative composition of soil humus based on original experimental data. Relevant data have been obtained for the above-ground organogenic horizons (layers) of the soils, formed under the influence of different vegetation from the middle mountain hypsometric and forest vegetation belt (1000 - 1600 m above sea level) of the Central Stara Planina. It has been confirmed that thinning activities in different forests has a weak effect on both – carbon accumulation and the qualitative and quantitative characteristics of the soil organic matter in the forest soil. The need to observe moderate and balanced management of pastures and meadows in mountainous areas to stimulate the processes of carbon accumulation in the soil component and turf has been emphasized.