

Temporal changes in forest ecosystem dynamics: Borçka planning unit

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Abstract: Forest ecosystem dynamics are substantially influenced by human interventions and other natural processes. This dynamic change is driven by disturbances such as forest fires, clear cutting, insect infestation etc. leading to deforestation. Forest dynamics are also affected in a positive way via natural growth, regeneration, afforestation etc. and result in an increase on forest lands. Management and planning of forest resources in a sustainable manner is only possible by understanding and monitoring the changes carefully. Therefore, there is a need to compare the past and the present composition of the forest ecosystem to detect the spatiotemporal changes. Investigating this trend is of great importance for many fields such as sustainable forest management, climate change, global forest inventory, forest industry and timber supply. The aim of this study is to evaluate the spatiotemporal changes in Borçka Planning Unit (Artvin)'s forests for the last 35 years in terms of land use (ha), tree species composition, growing stock (m³), crown closure (%), and patches as well. To display the changes over the selected period, forest management plans of the study area from 1972 to 2006 and forest cover maps were used. Geographic Information System software, ArcGIS 10.1™, was utilized to perform spatial analysis and cartographic representation of the forest structure. The preliminary results show that there is an increase in forest area in the planning unit from 8535 ha in 1972 to 8982 ha in 2006. There is a drastic increase from the beginning of the 1980s in the productive forest areas (having crown closure >%10). Driven factor of this positive trend is the result of decrease in social pressure on forests through migration of population from rural areas to crowded cities. Furthermore, successful rehabilitation activities have also positive effects on improvement of productive forests. The results of this study are expected to help the forest managers and decision makers to understand the trends in forest resources, and sustain goods and services in the ecosystems.

Keywords: Spatiotemporal change, Forest management and planning, Geographic Information Systems (GIS), Borçka-Artvin