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## Study on Vegetation Structure, Biomass Production and Regeneration of Broad Leaved Forest in the Eastern Himalayan Region, Nepal

ANJANA GIRI, KLAUS KATZENSTEINER

*University of Natural Resources and Applied Life Sciences (BOKU), Institute of Forest Ecology, Austria*

### Abstract

The main aim of the study was to assess the anthropogenic impact on vegetation composition, biomass production and regeneration of tree species in mixed broadleaved forest of the Sargamatha National Park buffer zone areas. The forests were mainly differentiated into broadleaf disturbed forest (BLDF) and broadleaf semi-disturbed forest (BLSDF) considering the scale of anthropogenic disturbances such as percentage of biomass extraction, lopping, trampling coverage and grazing intensity. For each forest type, 10 m radius circular plots were laid for sampling trees, 5 m circular plots for sampling & shrubs, and 1 m x 1 m plots for seedling and herbs. In both forests, *Quercus semicarpifolia* and *Rhododendron arboreum* were the main dominant tree species; however, the extent of dominance of tree species differed considerably in each forest types. In both forest type density and basal area was high for *Q. semicarpifolia*. The distribution of *Q. semicarpifolia* and *R. arboreum* along with diameter classes showed high stem density mainly concentrated in 2–10 cm dbh class. In general, seedling-to tree ratio was high for *R. arboreum* in both types of forests. Seedlings of *Q. semicarpifolia* were almost absent in disturbed forest, and its ratio of seedling to tree was very low even in the semi-disturbed forest. The absence of regeneration of *Q. semicarpifolia* was reflected by the absence of seedlings in diameter class below 5 cm. The absence could be associated with the practice of biomass removal. Overall, tree species richness was high in less disturbed forest. The Shannon and Simpson indices were also high in less-human-impacted forest. The lower species diversity in the disturbed forest was probably due to comparative high human disturbance. The study found that *Rhododendron* species in the study sites were not frequently cut, browsed, or lopped due to religious believe and its ornamental value. Thus *R. arboreum* is expected to be slowly expanded if biotic pressure is maintained less. This may cause change in the vegetation structure. On the whole, managing the forest in an equitable and sustainable basis could satisfy basic needs and improve the livelihood of rural people in the study area.

**Keywords:** Broadleaved disturbed forest, broadleaved semi-disturbed forest, *Quercus semicarpifolia*, regeneration, *Rhododendron arboreum*, vegetation structure