

Land Use and Spatial Distribution of Two Gum And Incense Producing Tree Species In The Blue-nile Valley of Wogidi District, Ethiopia

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ABSTRACT The study was conducted in the Blue-Nile valley of Wogidi district in Ethiopia, where woody vegetation degradation associated with intensive land use activities has become a national concern. It was undertaken with an overall objective of documenting the impacts of land use and topography on the spatial distribution of two gum and incense producing tree species, *Boswellia papyrifera* (Del.) Hochst and *Commiphora africana* (A. Rich.) Engl.. Five land use units, each with two slope categories ($\leq 25\%$ and $> 25\%$) were subjected to a 5x2 factorial arrangement and a total of 50 sample points were employed to measure density, crown cover, and age ratio of trees. Analysis of vegetation attributes revealed that, except for density of *C. africana*, all the vegetation attributes did show lower status in the heavily populated land use units than the control site reflecting the differential impact of intensive land use pressure against protection. In the heavily populated land use unit (Luu-3) for example, density, cover and age ratio of *B. papyrifera* trees were as low as 8.3 trees/ha, 7.7% and 0.21 respectively. In contrast to this, i.e. in the site of low population pressure (the control) the same attributes appeared to be measured as 77 trees/ha, 7.7% and 0.51 respectively. However, attached to the proximity ecological position, density and crown cover of *B. papyrifera* showed no significant difference ($P > 0.05$) between Luu-1 and Luu-2. Density of *C. africana*, most likely due to its affinity to a specific microhabitat, it did not differ among all land use units ($P > 0.05$). Between the slope aspects of the area, *B. papyrifera* and *C. africana* were found to dominate the steep ($> 25\%$) and gentle ($\leq 25\%$) slopes respectively. Regarding density of *B. papyrifera*, while it was 196 trees/ha in the steep slope, 146 trees/ha were documented from the lower slope aspect. Inversely related to this, *C. africana* had 68 and 102 trees/ha on $> 25\%$ and $\leq 25\%$ slopes respectively. Age ratio analysis of *B. papyrifera* trees, however, did not show significant difference ($P > 0.05$) between these two slope categories. In the study area therefore, land use and slope were identified as determinant factors to the spatial distribution of woody vegetation and policy frameworks to account these factors are suggested to be substantial in the management of such resources.

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