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Floristic Composition, Diversity, and Structure in the Changing Landscape of the Bale Mountains National Park, South-eastern Ethiopia

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Abstract: Bale mountains national park (BMNP) is one of the 34 International Biodiversity Hotspots that comprise a variety of life forms. However, it faces a critical challenge from illegal settlements and livestock grazing. This study aimed to estimate the plant composition and structure in the changing landscape of BMNP. The vegetation and environmental data were collected systematically from 96 plots laid along 24 line transects. Vegetation hierarchical clustering and landscape structural analysis were made using R software version 3.5.2 and FRAGSTATS version 4.2.1, respectively. A total of 205 species that belongs to 153 genera and 71 families were identified. The overall Shannon diversity and evenness index was 4.34 and 0.81, respectively. Both species richness and Shannon diversity index were significantly higher in the edge habitat than the interior at p <0.05. However, the basal area was higher in the interior habitat (173.79 m^2 ha^{-1}) compared to the edge (64.15 m^2 ha^{-1}). This study revealed that BMNP is a biologically diverse and ecologically significant area that provides a variety of ecological and economic benefits to the surrounding communities. Though its habitats are changing alarmingly and urgent restoration and conservation action needs to be taken to reverse this situation.

Keywords**:** Basal area, Floristic composition, Hierarchical clustering, Illegal settlements