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Role of Traditional Enclosures on the Diversity of Herbaceous Vegetation in a Semi-arid Rangeland, Southern Ethiopia

AYANA ANGASSA¹, GUFU OBA², ANNA C. TREYDTE³

¹Hawassa University, Department of Animal and Range Sciences, Ethiopia

²Norwegian University of Life Sciences, International Environment and Development Studies, Norway

³University of Hohenheim, Dept. of Plant Production and Agroecology in the Tropics and Subtropics, Germany

Abstract

The use of traditional enclosures locally known as *kalo* is widely practiced by pastoralists in East African rangelands for dry season grazing by calves. Traditional range enclosures can be used as a method of rangeland restoration where rangelands are often heavily grazed to allow the herbaceous vegetation diversity to recover. Generally, grazing management and seasonality strongly influenced the recovery potential of herbaceous vegetation in semi-arid rangelands of southern Ethiopia after history of heavy grazing. Despite the expansion of range enclosures in the communal rangelands of southern Ethiopia, only few studies have documented the role of range enclosures and seasonality on the conservation of herbaceous vegetation diversity. We investigated effects of management (enclosures versus grazed landscapes), age of enclosures and seasonality related to rainfall (*i.e.*, independent variables) on herbaceous biomass, grass basal cover, herbaceous species abundance, species richness and diversity in a savannah rangeland of southern Ethiopia. We further assessed the relationship between the herbaceous biomass and species richness. Management significantly affected most of the herbaceous response variables (*i.e.*, comparing enclosures and open grazed). Herbaceous biomass, grass basal cover, herbaceous species richness and diversity were greater in enclosures than in grazed areas. Rainfall was also influential on herbaceous biomass, grass basal cover, abundance of herbaceous species, herbaceous species richness and diversity. Herbaceous biomass, abundance and diversity did not however vary with the age of enclosures, while herbaceous species richness appeared to decrease as the age of enclosures advanced. Grass basal cover initially decreased and later on increased with the age of enclosures, so that the older enclosures disclosed improvement of grass basal cover.

Keywords: Herbaceous layer, rainfall variability, savannahs, southern Ethiopia