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Collective Management on Communal Grazing Lands: Its Impact on Herbage Production and Land Degradation in the Upper Blue Nile Basin, Northwestern Ethiopia

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Abstract

Collective action on communal grazing land has evolved in the highlands of northwestern Ethiopia to mitigate the critical problem of land degradation caused by overgrazing and to ensure sustainable production of natural pasture mainly for draught oxen feeding. However, large portions of the communal grazing lands are still managed under free grazing which has been practised continuously in the past. This study was undertaken to assess impacts of three different types of grazing land management (GLM) viz. a) freely open communal GLM, b) traditional collective management of communal grazing land locally named as ‘yebere sar’ GLM and c) private holding GLM. These were coupled with two slope gradients (<10%; 15–25 %). Parameters studied were water erosion and vegetation dynamics at Maynet Kebele in the upper Blue Nile basin, Ethiopia. The interaction effect of GLM and slope was found significant ($p < 0.05$) for hydrological responses. The average runoff coefficient was more than 20 % implying that about a quarter of the rainfall amount turns to surface runoff on grazing lands. Freely open communal GLM on a steeper slope of 15–25 % resulted in consistently highest cumulative runoff and soil loss amounting to 491 mm and 32 t ha⁻¹ y⁻¹, respectively. When the vegetation cover was below 40 %, runoff and soil loss dramatically increased. This suggests that freely open communal GLM is typically having a higher risk of water erosion in the study area. As expected, yebere sar GLM appeared to reduce surface runoff by more than 40 % and curb the rate of soil erosion by more than 50 % compared to freely open communal GLM. Its vegetation cover persisted above 70 % all the time, meeting a threshold level recommended to keep surface runoff and soil loss to minimum. Ground cover was the most significant factor determining the level of runoff and sediment loss on pastureland. Adequate resting of a pasture from grazing at the right time is an extremely important component to improve vegetation cover and herbage production that in turn arrest land degradation for which any grazing land management practice needs to give due emphasis.

Keywords: Collective action, communal grazing land, herbage production, land degradation, northwestern Ethiopia, vegetation cover, water erosion