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Expansion of Crop Cultivation and its Impacts on Land Cover Changes in the Borana Rangeland Southern Ethiopia

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Abstract

Rangelands form one of the most important parts of the terrestrial ecosystem. The benefits of rangelands include regulation of ecosystem services, storage and sequestering of carbon, mitigation and support of extensive livestock production. However, such benefits are sometimes underestimated especially when crop cultivation is introduced into the rangelands. Unlike livestock production, which is the traditional form of land use, cultivation activities have been proven to deteriorate the ecology of the rangeland. Furthermore, it is one source of greenhouse gas fluxes. Activities such as clearing vegetation in favour of crop farms result in a loss of plant biomass, soil erosion, loss of soil organic carbon and land degradation. The pastoralists are engaging more in crop cultivation as an adaptation strategy against economic stress. However, the impacts of the new land use on land cover changes are not fully appreciated. The study examines the reasons for expansion of cultivated land and its impacts on land cover changes from 1985 to 2011. Data was collected from 265 agro-pastoral communities via interviews and integrated with rainfall data and satellite images. Landsat images of February 1985 and 2011 were also used to ascertain land cover changes. Results showed that inadequate household income and larger family sizes are the main causes of expansion of cultivation among the Borana pastoralists. Cultivated land increased by 12% and barren land by 2% while grassland, woodland and bush land decreased by 2%, 1% and 10% respectively. Unreliable rainfall and bush encroachment constrain pastoralism which necessitates livelihood diversification. Grass and woodland are in threat of degradation because they are decreasing in favour of farmland. To ensure sustainable rangeland management there is need to strengthening cooperation and communication among the pastoralists, policy makers and all other stake holders.

Keywords: Cultivation activities, land cover changes, rangeland ecosystems