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Effects of Charcoal Production on Soil Properties and Vegetation Attributes

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Abstract

Pastoral and agro-pastoral communities in ASALs are currently faced by myriad of problems which directly or indirectly undermine their livelihoods and environments. These problems are attributed to by factors such as social-cultural, economic, environmental, ecological and policy changes. The area that has experienced dramatic changes is vegetation and soil. One of the major contributor is charcoal production in drylands. This study therefore assessed the impacts of charcoal production on vegetation biomass production, density, diversity and cover and soil PH, organic carbon, nitrogen, phosphorus and potassium. The experimental design used was Randomised Complete Block Design (RCBD), where blocking was done based on charcoal production sites. The charcoal production sites were then grouped into four classes reflecting the estimate age of kiln namely: <1, 1–2, 2–3, >3years, which were then replicated four times depending on the topography (upland or lowland) and season (rainy or dry). A transect of 50 m from the centre of the kiln in North, East, South and West direction were measured giving a plot measuring 90m × 90 m. Tree species were grouped into trees/shrubs, saplings and seedlings then distance sampling method done along the measured transect for vegetation attributes of interest. Soil properties comparison were done by comparing samples collected from burnt and un-burnt sites from each plot with assumption that the only factor for variation could be due to charcoal burning. Overall, the goal of this research is to inform interventions to ensure sustainable woodland management and at the same time can guide decision making process in wildlife resource management and provision of ecosystem services.

Keywords: ASALs, charcoal production, ecosystem services , sustainable woodland management

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