

**Impact of Charcoal Production on Soil Properties and Vegetation in the Central Gonja  
District of the Northern Region, Ghana**

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**ABSTRACT**

This study assessed the impact of charcoal production on soil properties, vegetation and the perception of charcoal producers on the environmental impacts of their activities in the Central Gonja District of the Northern Region, Ghana. Data acquired suggest significant differences in the proportions (or fractions) of clay and sand in soils sampled within 0-30 cm depth at sites of charcoal production referred to simply (as burnt sites) and sites with no observable indications of charcoal production (or unburnt sites). Soil silt fractions from 0-30 cm and 30-60 cm depths were, however, quite similar at both burnt and unburnt sites. The hydraulic conductivity of soils from 0-30 cm and 30-60 cm depths at burnt and unburnt sites also exhibited distinct differences ( $P < 0.001$ ) and ( $P < 0.029$ ) respectively. Soil chemical properties such as potassium ( $P < 0.002$ ) and magnesium ( $P < 0.011$ ) showed significant difference at 0-30 cm between burnt and unburnt. There was, however, no significant difference between burnt and unburnt sites within the 30-60 cm for same soil chemical properties, potassium ( $P < 0.274$ ) and magnesium ( $P < 0.076$ ). In terms of land use and (land) cover change in the Central Gonja District, analysis and interpretation of Remote Sensing and GIS data from Landsat TM images of 1990, 2000 and 2010 suggest reduction in the pristine or original guinea savannah (woody) vegetation of the area from 22,662 to 11,739 ha over the twenty-year period from 1990 to 2010, with grass/herbaceous and built-up areas increased from 23,088 to 95,148 ha and 6,355 to 81,702 ha, respectively. Even though charcoal production and marketing/trade are important economic activities for people in the district, providing income to the charcoal producers especially women, it appears to have had several environmental challenges in terms of deforestation, impact on soil parameters especially at burnt sites, bushfires and soil erosion.

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