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Soil Physical and Hydraulic Properties of Irrigable Lands in the Northern Region of Ghana

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Abstract: The study was carried out to determine soil physical and hydraulic properties of irrigable lands in three selected irrigation schemes in the Northern Region of Ghana. Soil properties estimated were hydraulic conductivity, gravimetric moisture content, volumetric moisture content, soil texture, bulk density, soil infiltration and soil porosity. Data was obtained from both primary and secondary sources with methods used for data collection as detailed survey, desk study, remote sensing and GIS, laboratory and field work. Average hydraulic conductivities recorded were 2.52 x 10^{-6} m/s, 2.28 x 10^{-6} m/s, and 1.87 x 10^{-6} m/s for Bontanga, Libga and Golinga irrigable lands respectively. The average volumetric water content was 0.25, 0.31 and 0.19 cm^3cm^{-3} and with 0.18 [1], 0.15 and 0.18 gg^{-1} average gravimetric water contents for Bontanga, Golinga and Libga, respectively. Bontanga and Libga irrigable areas recorded the same average dry bulk density of 1.8 g cm^{-3} whilst Golinga recorded 1.7 g cm^{-3}. The soil texture was sandy loam for the Bontanga and Golinga irrigable lands whilst Libga was a loamy sand with average soil porosity ranging from 0.31 to 0.35%. There were significant difference for average soil temperature, sand and silt percent and volumetric moisture content of unsaturated soils in different sites. The soil physical and hydraulic properties presented good and desirable qualities for the cultivation of different tropical crops.

***Keywords*:** Hydraulic conductivity, Soil porosity, Gravimetric moisture content, Bulk density, Volumetric moisture content