

Farmstead Planning for Federal University of Technology, Gidan Kwano Campus, Minna, Using Geographic Information System (GIS)

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Abstract

Functional geospatial-based farmstead planning is essential for the optimum utilisation of space, material, land, human and financial resources at the 10,650-hectare Main Campus of the Federal University of Technology (FUT), Minna; both in the short and long term, in order to enhance sustainable agricultural food production in the area. To realise these objectives in planning a farmstead, geographic information system (GIS) is useful, as it simplifies and enhances easier, faster and flexible database handling with precision and reliability in planning and monitoring. Therefore, this study used GIS technique to generate, convert and manipulate the topographic, surface and subsurface soils and geological databases for farmstead planning and decision support system for the Gidan Kwano (Main) Campus of the FUT, Minna. The physiographic analysis of the study area shows that the higher and lower terrain elevations are in the northern and southern wings of the study area respectively. It was observed that water erosion is predominant during the initial rains, such that if the soils are exposed, they are easily washed away by runoff water and by wind erosion when the soils are dry. Sediments which cap the surface soils occur on the middle to lower slope which occupies a greater percentage of the area. The sediments limit soil aeration, soil micro-biological activities and productivity. It was also found out from the soil test that the nutrient status of the area is low. Suitable locations for livestock shelter, farmhouse, processing house, waste sites and cropping zones were identified in the farmstead plan for the area. The result of the study is useful for the sustainable and effective agricultural and land use partitioning of the campus.

Keywords: Farmstead, Agriculture, Planning, Geographic Information System

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