

Conversion of a Tropical Rainforest to Other Forms of Land Use: Impact on Soil Properties



Oke D.O., Adesanya O.A. and Niniola R. A.

Department of Forestry and Wood Technology, Federal University of Technology, Akure, Nigeria

Oke D.O., Adesanya O.A. and Niniola R.A. Conversion Of A Tropical Rainforest To Other Forms Of Land Use: Impact On Soil Properties *Nigerian Journal of Forestry* 41(1), 2011

Abstract

This study examined the changes that take place in soil properties of a tropical rainforest ecosystem following its clearance and replacement with other forms of land use (plantation forest, cocoa agroforest, food crops cultivation). The study was carried out in Akure Forest Reserve. Soil samples were collected at two depths (0-20 cm and 20-50 cm) from undisturbed portions of the reserve and from the portions that had been converted into the various other land uses. Microbial population, bulk density, particle size distribution, organic carbon, total nitrogen, phosphorus, potassium, calcium and magnesium of the soil samples were determined in the laboratory. There was no significant difference in soil textural properties but bulk density was significantly lowest under the natural forest (0.72 g/cm^3). The highest value of topsoil organic carbon (2.63 g/100g) and available P (24.74 mg/kg) were observed under the natural forest, and the lowest (0.82 g/100g organic carbon and 11.91 mg/kg available P) in cropland. The results also revealed that total soil nitrogen was significantly higher in cocoa agroforest (0.30 %) and in undisturbed primary rainforest (0.22 %) than in areas converted to other forms of land use. There was no significant difference in fungi and bacteria population among the land use types. The results of this study suggest that soil properties are adversely impacted when natural forest is converted for agricultural purposes. The impact is however mild in practices involving minimal tillage and appropriate use of trees.

Keywords: Tropical rainforest, forest conversion, soil texture, soil nutrients, soil microbes