World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:17, No:10, 2023

The Influence of the Soil in the Vegetation of the Luki Biosphere Reserve in the Democratic Republic of Congo

Authors : Sarah Okende

Abstract : It is universally recognized that the forests of the Congo Basin remain a common good and a complex ecosystem, and insufficiently known. Historically and throughout the world, forests have been valued for the multiple products and benefits they provide. In addition to their major role in the conservation of global biodiversity and in the fight against climate change, these forests also have an essential role in the regional and global ecology. This is particularly the case of the Luki Biosphere Reserve, a highly diversified evergreen Guinean-Congolese rainforest. Despite the efforts of sustainable management of the said reserve, the understanding of the place occupied by the soil under the influence of the latter does not seem to be an interesting subject for the general public or even scientists. The Luki biosphere reserve is located in the west of the DRC, more precisely in the south-east of Mayombe Congolais, in the province of Bas-Congo. The vegetation of the Luki Biosphere Reserve is very heterogeneous and diversified. It ranges from grassy formations to semi-evergreen dense humid forests, passing through edaphic formations on hydromorphic soils (aquatic and semi-aquatic vegetation; messicole and segetal vegetation; gascaricole vegetation; young secondary forests with Musanga cercropioides, Xylopia aethiopica, Corynanthe paniculata; mature secondary forests with Terminalia superba and Hymenostegia floribunda; primary forest with Prioria balsamifera; climax forests with Gilbertiodendron dewevrei, and Gilletiodendron kisantuense). Field observations and reading of previous and up-to-date work carried out in the Luki biosphere reserve are the methodological approaches for this study, the aim of which is to show the impact of soil types in determining the varieties of vegetation. The results obtained prove that the four different types of soil present (purplish red soils, developing on amphibolites; red soils, developed on gneisses; yellow soils occurring on gneisses and quartzites; and alluvial soils, developed on recent alluvium) have a major influence apart from other environmental factors on the determination of different facies of the vegetation of the Luki Biosphere Reserve. In conclusion, the Luki Biosphere Reserve is characterized by a wide variety of biotopes determined by the nature of the soil, the relief, the microclimates, the action of man, or the hydrography. Overall management (soil, biodiversity) in the Luki Biosphere Reserve is important for maintaining the ecological balance.

Keywords : soil, biodiversity, forest, Luki, rainforest
Conference Title : ICAPQ 2023 : International Conference on Soil Productivity and Quality
Conference Location : Paris, France
Conference Dates : October 30-31, 2023