Carbon Sequestration Modeling in the Implementation of REDD+ Programmes in Nigeria

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Abstract : The forest in Nigeria is currently estimated to extend to around 9.6 million hectares, but used to expand over central and southern Nigeria decades ago. The forest estate is shrinking due to long-term human exploitation for agricultural development, fuel wood demand, uncontrolled forest harvesting and urbanization, amongst other factors, compounded by population growth in rural areas. Nigeria has lost more than 50% of its forest cover since 1990 and currently less than 10% of the country is forested. The current deforestation rate is estimated at 3.7%, which is one of the highest in the world. Reducing Emissions from Deforestation and forest Degradation plus conservation, sustainable management of forests and enhancement of forest carbon stocks constituted what is referred to as REDD+. This study evaluated some of the existing way of computing carbon stocks using eight indigenous tree species like Mansonia, Shorea, Bombax, Terminalia superba, Khaya grandifolia, Khaya senegalenses, Pines and Gmelina arborea. While these components are the essential elements of REDD+ programme, they can be brought under a broader framework of systems analysis designed to arrive at optimal solutions for future predictions through statistical distribution pattern of carbon sequestrated by various species of tree. Available data on height and diameter of trees in Ibadan were studied and their respective potentials of carbon sequestration level were assessed and subjected to tests so as to determine the best statistical distribution that would describe the carbon sequestration pattern of trees. The result of this study suggests a reasonable statistical distribution for carbons sequestered in simulation studies and hence, allow planners and government in determining resources forecast for sustainable development especially where experiments with real-life systems are infeasible. Sustainable management of forest can then be achieved by projecting future condition of forests under different management regimes thereby supporting conservation and REDD+ programmes in Nigeria.
Keywords : REDD+, carbon, climate change, height and diameter

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