



Tropentag, September 18-21, 2016, Vienna, Austria

“Solidarity in a competing world —
fair use of resources”

Understory Tree Diversity and Regeneration Pattern in Four Land-Use Systems in Tropical Rainforests, Nigeria

JONATHAN C. ONYEKWELU¹, ADEOLA A OLABIWONNU²

¹The Federal University of Technology, Dept. of Forestry and Wood Technology, Nigeria

²Federal University of Technology, Akure, Forestry and Wood Technology, Nigeria

Abstract

Biodiversity assessment in tropical rainforests has focused mainly on the overstory components with limited attention accorded to understory species. The diversity and composition of understory tree species and tree regeneration pattern were examined in four forest land-use systems: primary, degraded, enriched and *Gmelina arborea* plantation forests in Ondo State, Nigeria. Overstory species were inventoried in eight 400 m² temporary sample plots randomly laid across two hectare plots in each land-use system. Sapling and seedling species were investigated in 25 m² and 4 m² quadrants and sub-quadrants, respectively in all plots. Tree species totaled 53 in 25 families and disproportionately distributed among the land-use systems. The most important species were *Mansonia altissima*, *Cola gigantea*, *Bosqueia angolensis* and *G. arborea*, in primary, enriched, degraded and *Gmelina* plantation forests, respectively. The Shannon-Wiener diversity index of the overstory layers of the four forest land-use systems was higher than those of the sapling layers. A significant variation was observed in species diversity of understory species in the four land-use systems. Some abundant species in understory layers include *Strombosia* spp, and *Sterculia* spp, (primary forest); *Lecaniodiscus cupanioides* and *Carpolobia lutea* (enriched forest); *C. lutea*, and *Macaranga barteri* (*Gmelina* plantation); *S. pustulata*, and *Bridelia ferruginea* (degraded forest). The order of species richness in sapling layer is: *Gmelina* plantation (13) < primary forest (15) < degraded forest (16) < enriched forest (21) while it is enriched forest (18) = primary forest (18) < *Gmelina* plantation (24) < degraded forest (25) in seedling layer. When understory (seedlings and saplings) species richness was pooled together, species richness in the understories of the four land-use systems compared favourably with those of the overstories, except in *Gmelina* plantation, indicating the bright prospects of the ecosystems if degradation activities are minimised or halted. Knowledge of understory species diversity and regeneration pattern is essential in planning sustainable forest management and biodiversity conservation.

Keywords: Biodiversity, conservation, forest plantation, land-use system, natural forest, regeneration, understory species