

**EFFECT OF COLLABORATIVE FOREST MANAGEMENT ON CARBON  
STOCKS, SPECIES DIVERSITY AND STEM DENSITY IN MABIRA  
CENTRAL FOREST RESERVE, UGANDA**

**BY**

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## DECLARATION

I, **Phillipson Mugumya**, hereby declare that the work contained in this dissertation is a true copy of my work effort except where has been referenced and has never been submitted for any degree award at this or any other University or institution of higher learning.

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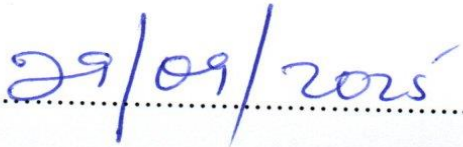
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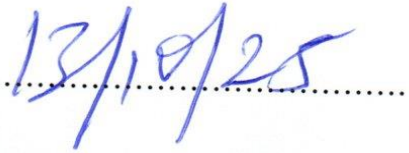
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## ACRONYMS

AGB	Above ground biomass
Asl	Above sea level
CFLRP	Collaborative forest landscape restoration program
CFM	Collaborative forest management
CFR	Central forest reserve
CO <sub>2</sub>	Carbon dioxide
CYC	Carbon yield coefficient
DBH	Diameter at breast height
<i>Et al</i>	And others
FAO	Food and Agricultural Organization
FC	Forest Certification
FTEA	Flora of Tropical East Africa
GPS	Global Positioning System
IUCN	International Union for conservation of Nature
JFM	Joint Forest Management
Km	Kilometers
Ms Excel	Microsoft excel software
MWE	Ministry of water and environment
NFA	National Forest Authority
REDD+	Reduced emission through degradation and deforestation
VYC	Volumetric yield coefficient

## ABSTRACT

Collaborative forest management (CFM) is a form of forest governance in which local communities are involved in the superintendence and administrative processes related to forest resources. It is believed that forests under such management are better in tree diversity and conservation status thus hold more carbon stocks. The study assessed the influence of CFM on carbon stocks in Mabira central forest reserve. This was achieved through measuring carbon stocks in forested areas under CFM viz a viz non-CFM areas, determining tree species diversity in forested areas under CFM viz a viz non-CFM areas, and determining tree stem-densities in areas under CFM viz a viz non-CFM areas in Mabira Central Forest Reserve. Data were collected from alternating plots laid along transects running from north to south in the different purposively selected forest areas. Field carbon stock assessment followed the procedure described by Asseffa *et al.*, (2013) Tree species diversity included species richness and species evenness as sampled among plots in the selected forest areas. Tree stem-density assessment was hinged on the method described by Eilu *et al.*, (2004). The study findings show that non-CFM areas have a greater variability and wider spread carbon stock values compared to CFM areas. CFM areas also had lower species richness compared to non-CFM areas. CFM areas however, exhibited more species diversity and variability than non-CFM areas. CFM areas had higher average stem density stands (309 stems per hectare) compared to non-CFM areas. Recommendations for improving collaborative forest management (CFM) areas include implementing targeted interventions to enhance carbon sequestration, such as promoting reforestation and afforestation with high-carbon-storing species, and strengthening monitoring and evaluation frameworks to assess carbon stock changes over time. Additionally, efforts should focus on enhancing biodiversity conservation by implementing more stringent protection measures and reducing human disturbance, while encouraging community participation in biodiversity monitoring and conservation education.

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