

Referência Completa do Artigo:

Gumbo, Davison, Jessica Clendenning, Christopher Martius, Kaala Moombe, Isla Grundy, Robert Nasi, Kondwani Y. Mumba, Natasha Ribeiro, Gillian Kabwe, and Gillian Petrokofsky. 2018. "How Have Carbon Stocks in Central and Southern Africa's Miombo Woodlands Changed over the Last 50 Years? A Systematic Map of the Evidence." *Environmental Evidence* 7(1):16.

Resumo Original (Abstract):

Miombo woodlands cover \approx 2.7 million km² of central and southern Africa between dry (650 mm mean annual rainfall) and moist miombo (1400 mm) and are currently threatened by land use and land cover changes that have intensified over the last 50 years. Despite the miombo's global significance for carbon (C) storage and sequestration, there has been no regional synthesis that maps carbon stocks and changes in the woodlands. This information is crucial to inform further research for the development of appropriate policies and management strategies to maintain and increase C stocks and sequestration capacity, for conservation and sustainable management. We assembled a systematic map to determine what evidence exists for (1) changes in carbon stocks in miombo woodlands over the period 1960-2015; (2) differences in carbon density in miombo with different conservation status; (3) trends in carbon stock recovery following human disturbance; and (4) fire management impacts on carbon stocks and dynamics.

We screened 11,565 records from bibliographic databases and grey literature sources following an a priori research protocol. For inclusion, each study had to demonstrate the presence of miombo-typical species (*Brachystegia*, *Julbernardia* and *Isoberlinia*) and data on above- or below-ground carbon stocks or plant biomass. A total of 54 articles met the inclusion criteria: 48 quantitative and eight qualitative (two of which included quantitative and qualitative) studies.

The majority of studies included in the final analyses are largely quantitative in nature and trace temporal changes in biomass and carbon in the miombo woodlands. Studies reported a wide range (1.3-95.7 Mg ha⁻¹) of above-ground carbon in old-growth miombo woodland. Variation between

years and rainfall zones and across conservation area types was large. An insufficient number of robust studies that met our inclusion criteria from across the miombo region did not allow us to accurately pool carbon stocks and trends in miombo old growth. Thus, we could not address the four questions originally posed in our protocol. We suggest that future studies in miombo woodlands take longer term observational approaches with more systematic, permanent sampling designs, and we identify questions that would further warrant systematic reviews, related to differences in C level recovery after disturbance in fallow and post-clearing re-growth, and the role of controlled fire management.

Palavras Chave (Keywords):

Biomass, Brachystegia, Carbon stocks, Conservation area status, Fire management, Isoberlinia,

Julbernardia, Old-growth, Re-growth, Soil organic matter.

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