

Vegetation Change Trends & Implications

Land cover, vegetation dynamics and fire in Uganda's SLM zones · Sustainable Land Management Uganda

I. Introduction

Vegetation forms the most important natural interface between the atmosphere and the land surface. Land degradation is therefore often associated with vegetation change, on both short and long time scales. Long-term changes are generally studied under land cover change; short-term changes concern seasonal and inter-annual variation.

II. Land cover & land cover change

According to the National Biomass Study (MWE, 1999), land cover for Uganda's SLM zones differs significantly between zones, dominated overall by cropland. High-intensity cultivation zones such as Eastern Uganda, the Lake Victoria Crescent and the Highlands are running out of options for lateral expansion, meaning production intensification is imminent (see land-cover table below).

Land cover change statistics for Uganda are relatively scarce, owing to inconsistent and incomplete vegetation map data over time — a major challenge for backward analysis of historical trends. A mapping process is underway to update, backdate, improve and harmonise the various datasets to arrive at more reliable conclusions on trends in vegetation dominance and area losses and gains. A first quick analysis for Uganda suggests substantial losses in forest, shrub and savannah grassland in favour of cropland expansion between 2000 and 2013.

III. Vegetation dynamics

Vegetation dynamics for Uganda are analysed using NDVI time series derived from the MODIS Terra satellite from 2000 to 2017, showing large variation in growth and growing seasons across evergreen, bimodal and mono-modal climate systems. Periods of drought are readily identifiable from non-green locations.

IV. Net primary production & carbon assimilation

Net primary production represents the actual carbon assimilation rate and carbon stocked in Uganda's vegetation growth, varying considerably between cropland and forested areas. Land management is one of the key factors determining carbon losses from these locations, ultimately affecting how much carbon remains for storage in soils — supporting a healthy soil system, soil fauna, and water and nutrient retention capacity.

V. Occurrence of fires & burning

Fire is an agent of change, and many long-term vegetation shifts are driven by burning. While fire is also a natural phenomenon, by far the largest share of burning in Uganda is human-induced. MODIS

satellite imagery analysed for 2016 shows, on a two-weekly basis, where and when fire acts as an active agent of change — from natural bush fires and hunting activity to slash-and-burn practice, forest clearing, wetland reclamation, and the burning of crop residues.

Land cover (%)	Lake Victoria Crescent	Eastern Uganda	Eastern & South-western Highlands	Cattle Corridor	Northern Uganda
Croplands	59	79	58	31	45
Wood & shrub lands	7	4	10	26	40
Forest lands	13	0	12	1	0
Grasslands	14	5	17	36	14
Wetlands	4	10	1	2	1
Inland water bodies	3	2	1	4	0
Bare & built-up areas	1	0	0	0	0