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Flora and Vegetation of East African Wetlands in the Context of Land Use Changes

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Introduction

Wetlands in East Africa are increasingly converted to cropland due to growing food demand and high fertility of wetland soils

Intensification affects land use Of **biodiversity** and **ecosystem functions** as well as provision of ecosystem services.

Total number of species however rises as agriculture creates new habitats which are occupied by pioneer species, some of them introduced.



Biodiversity and Ecosystem Services



Tall grasses and sedges of largely unused lands Used as **building** and thatching material, also for mats, baskets etc.

Temporary fishermen's hut built with the grass Vetivera nigritiana

Weeds on cropland with medical properties:

Disturbance also creates **opportunities** for invasive species.



Native Acmella caulirhiza (left): E.g. against toothpain Introduced Bidens pilosa (middle). E.g. to stop bleeding

Classification

Natural conditions (flooding regime, soil, climate etc.)

Land use (unused, cropland, fallow etc.)

Vegetation type Classification based on species composition

Many species are however only found in little disturbed environments

Key Findings

Land use changes

wetlands

increase the overall

floristic diversity of the

Most introduced species are restricted to croplands

Pristine vegetation lfakara

Pristine vegetation Namulonge

<u>Climate:</u>	Tropical savanna bioclimate (Aw)	Tropical rainforest to Tropical monsoon climate with bimodal rainfall distribution (Af / Am)	
<u>Natural</u> <u>Vegetation:</u>	Edaphic grasslands in the long and frequently flooded area, bushland in the fringe of the wetland	Papyrus marsh in the wetter, bushland and forest in the drier parts of the wetland	

and recent fallows, except invasive Mimosa pigra

Specific ecosystem services are only provided by natural vegetation

Phragmites mauritanus reed

Phragmitetum afro-lacustre Lebrun 1947

Cyperus papyrus- marsh with **Cyclosurus** interruptus Cypero papyri-Dryopteridetum gongylodes (Germain 1951) Schimtz 1963

Seasonally flooded riverbanks

Permanently flooded/wet areas

Ongoing work:

Floristic classification of further communities, especially of **croplands** and **fallows**

Regeneration Dynamics



Diversity and land use











Introduced species *Mimosa pigra* (Fabaceae)

Origin: South America **Invasive** in parts of **Africa**, Asia and Australia

Frequent in Namulonge Esp. on fallows from 2nd year.

Frequency (%) of selected neophytes in relation to land uses									
Species	Origin	Ifakara			Namulonge				
		crop	fall	unuse	crop	fall	unuse		
Ageratum conyzoides	America	16	13	-	90	50	5		

cropland (n=19) fallow (n=23) unused (n=24)

cropland (n=20) fallow (n=44) unused (n=19)



Number of species in cropland and unused plots and their overlap

Bidens pilosa	America	-	4	-	40	41	-
Hyptis spicigera	America	21	35	-	-	-	-
Ischaemum rugosum	Asia	37	13	-	-	-	-
Mimosa pigra	America	-	-	13	5	27	11
crop: cropland	n (semi-)n	atural ve	egetation				

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	I	I	1	I	1	I					
	0	100	200	300	400	500	600	700			
Time after Last Disturbance (days)											

Ageratum conyzoides • Leersia hexandra Selected • Cyperus difformis species: Ludwigia abyssinica • Cyperus distans Mimosa pigra Fuirena pubescens Paspalum scrobiculatum

--- ambiguous herbaceous species annual herbaceous species — perennial herbaceous species ·-·- woody species **Dynamics of Species Abundances in Namulonge:** Experiment at different positions in the wetland. Values are mean values of 4 plots (2x2m) each.

