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

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

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Abstract

Biodiversity and biomass are among the most important natural resources of wetlands worldwide. In East Africa, formerly undisturbed wetlands are increasingly used for agricultural production. Such changes occur at the cost of natural vegetation, impacting the biodiversity and biomass resources and hence the provision of related ecosystem services.

In order to assess the impact of long-term cultivation on wetland vegetation, we conducted a study in two different localities of East Africa, namely the inland valleys north of Kampala (Uganda) and the Kilombero floodplain, near Ifakara (Tanzania). Both study sites are mainly used for rice and vegetable cultivation, but differ strongly in their ecological properties and hence their potential natural vegetation. We sampled vegetation in a gradient of cultivation frequency from permanent croplands, to remaining areas of little disturbance. There we analysed species composition, structure, functional traits and potential uses. Additionally, we monitored the species turnover and biomass production after a strong disturbance event (tillage) in experimental plots.

Less disturbed vegetation in the Ugandan inland valleys is represented by marshes dominated by tall sedges, especially *Cyperus papyrus*, and swamp forests, while in the Kilombero valley the natural plant communities are tall grasslands of *Phragmites australis* and *Panicum fluviicola*. The dominating species of these communities can be sustainably used as resources for building or thatching material if their rhizomes and roots remain intact. The cropland flora consists to a large extent in pantropical weeds, often short-living sedges, while fallows often harbor some elements of regenerating natural vegetation. Plants used for food or medicinal purposes were found in all habitats. Invasive species such as *Mimosa pigra* and *M. pudica* were recorded at both sites, but they tend to be more frequent at the Ugandan study site. *Mimosa pigra* was frequent in fallows as well as in less disturbed sites.

Land use changes can increase the biodiversity of wetlands, because new habitats are emerging within the cultural landscape. These habitats are occupied by new species such as native pioneers or introduced or potentially invasive weeds. However, native species associated with undisturbed habitats are decreasing or even disappearing.

Keywords: Biodiversity, East Africa, ecosystem services, GlobE, land use changes, Tanzania, Uganda, vegetation, wetlands