Malagarasi-Moyovosi (MM) and Kilombero Valley (KV) Ramsar Sites in Tanzania Africa

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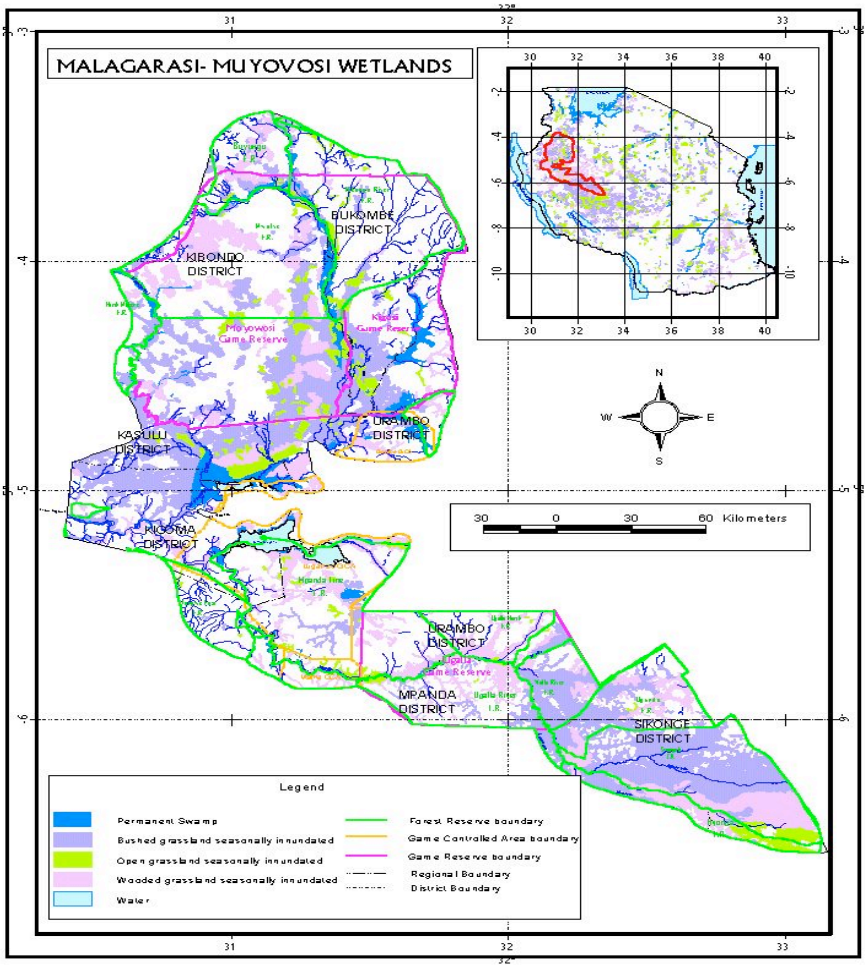

Figure 1: Map showing the location of the Malagarasi-Muyovosi (MM) Ramsar Site from Kauzeni (2009)

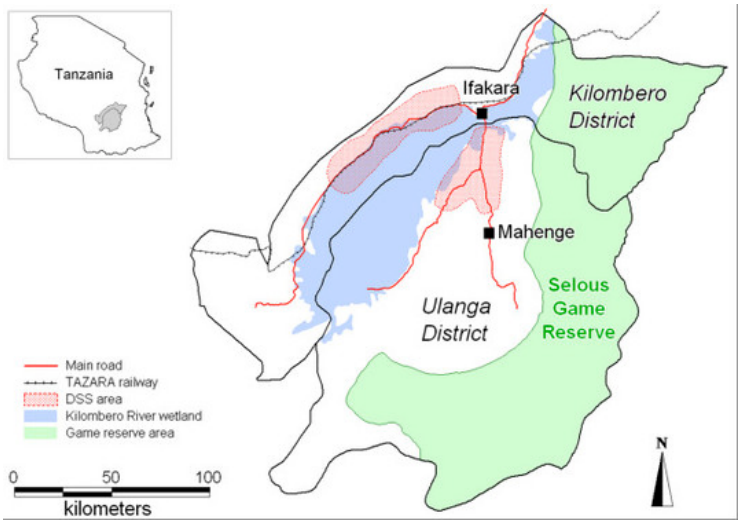

Figure 2: Map showing the location of the Kilombero Valley (KV) Ramsar Site from Hetzel et al. (2008)

Background Information

The MM lies within longitudes 30°15'S to 60°10'S and latitudes 30°40'E to 32°30'E (Figure 1). It covers an estimated area of 3.25 million ha. The core area of the Ramsar Site comprises lakes and open water in the dry season covering about 250,000 ha, together with a permanent papyrus swamp of about 200,000 ha with large peripheral flood plains that fluctuate on a yearly basis, depending on the amount of rainfall, but cover up to 1.5 million ha.

The KV site (Figure 2) is located in the two districts of Kilombero and Ulanga, it covers an area of 596,908 ha. The area is rare and unique because it comprises a myriad of rivers, which make up the largest seasonally freshwater lowland floodplain in East Africa. The Kilombero Valley Floodplain is of global, national, regional and local importance in terms of its ecology and biodiversity. The site is a key feature in the Selous-Kilombero seasonal wildlife migrations. The valley contains almost 75% of the world's population of the wetland dependent Puku antelope Kobus vardonii.

Main research and management problems

In MM, the current status of the Wildlife Dispersal Areas (WDAs) and the potential impact on animals due to degradation of WDAs as well as various social and environmental factors affecting their sustainability have not been adequately studied and are therefore not well understood. Further, the inherent coupling between the movements of large animals or interactions between animals and their environment in relation to the seasonal variations in wetland extent must be understood to efficiently project future habitats and location of prime importance for protection and conservation. In addition, there are numerous issues regarding usage and allocation of the limited resources in the region.

Tanzania has several river basins which if adequately developed from an agricultural perspective could contribute improved food security and reduction of poverty. While Tanzania has about 0.9 million hectares irrigable land, only 15% is currently under irrigation, with 80% of these being traditional irrigation systems (FAO, 2002). As such, developing dry land irrigation agriculture to extend growing seasons has potentials for development of the economic base of Tanzania (ERB, 2006). This is particular true for the KV where there is estimated to be about 329,600 ha of land

suitable for irrigated agricultural development (ERB, 2006). The potential pitfalls associated with initiating dry land irrigation, however, are numerous including problems of environmental degradation (ERB, 2006), depletion of groundwater resources (Shibuo et al., 2007), and increased incidence of water borne diseases such as malaria (Hetzel et al., 2008). Further, KV is an area heavily influenced and impacted by the development of hydropower in the region. In general, both changes in local-regional land-water management and coupled influences of global climatic change have impacts on water resources that need to be understood and considered to insure an equitable, efficient and sustainable use of water resources (i.e., integrated water resources management) (Kangalawe and Lyimo, 2010).

Possible end-users

In addition to being relevant to the people of the region, addressing the above questions in MM are relevant for the Tanzania Ministry of Natural Resources and Tourism (Wildlife Department), Tanzania Wildlife Research Institute (TAWIRI), the Ramsar Site office (human-wildlife conflicts during drought and floods incidences), research institutes (e.g IRA for communities coping/adaptation strategies in Western Tanzania).

The Institute of Resource Assessment (IRA) at the University of Dar es Salaam (UDES) is a main participant involved here from a research perspective. IRA is running, with Stockholm University as one partner, the SIDA/SAREC funded 'Integrated Natural Resources Management' research program.

This program includes research at both MM and KV. Further, Stockholm Environmental Institute (SEI) has an ongoing project looking at the governance structures in place to regulate and modulate the chain of production from agricultural land in Tanzania through biofuel production in Europe.

KV Ramsar Site management has been under the support of the Belgium Technical Cooperation (BTC) since November, 2006.

Site conditions

For MM, the region is located in the sub-humid tropical zone. The mean annual temperature in the region of Tabora is 23,4ºC (Acres, et al., 1984), temperature under the tropics oscillates slightly all along the year but no more than three or four degrees in average, showing small annual ranges (Hazelhurst and Milner, 2007). Temperatures are the lowest from May to August; the hottest month is October (Acres, et al., 1984). The wet season is approximately six months long with 90% of the precipitation occurring between November and April (McGregor and Nieuwolt, 1998). Yearly precipitation over the area averages between 800 and 1000 mm (McGregor and Nieuwolt, 1998). The precipitation pattern depends mostly on the Inter Topical Converge Zone (ITCZ), which brings rains, depending on the latitudinal position of the overhead sun with a time lag of about four to six weeks. In Eastern Africa, there are two rainy seasons: the long one (March and April) and the short one (November and December). Rainfall variability in East Africa is very high and the arrival of rainy season varies greatly between years (Nicholson, 1988 cited in McGregor and Nieuwolt, 1998).

The MM wetland is draining a large part of north western Tanzania (approximately 3,25 million hectares) and is constituted of numerous rivers and streams (Hughes et al., 1992). The main rivers

in the wetlands flow southward. The Malagarasi River has its headwaters in the highlands of Burundi and the Muyovosi headwaters are located close to the southern shore of Lake Victoria, as are those of the Kigosi River. The southern part of the wetlands is drained by the Ugalla and Wala Rivers, with headwaters in central Tanzania near Tabora. The Zimbwe River, which feeds and drains Lake Sagara before its confluence with the Ugalla River to the west, is an extensive swamp/lake/floodplain system reaching 24 km in width above Lake Sagara (5°14'S/31°07'E). The Zimbwe is encompassing 93,000 ha of wetlands and 8,000 ha of permanent swamps (Hughes et al., 1992).

Variation of land cover and vegetation in MM can be observed with miombo woodlands as the typical land cover of the area. They are large and discontinuous woodlands covering most of the elevated areas. The miombos can be interspersed with mbugas grasslands constituted mostly of hyparrhenia grass (approximately one meter high). Areas of lower elevation are principally covered by savannah. Swamps and marshes develop in the lowest parts of the landscape. Seasonally inundated floodplains (Bondeni in Swahili) have specific features i.e. riparian plants develop around seasonal ponds and water crosses roads. At the catchment scale encroachment and deforestation are common especially for the purpose of increasing the size of settlements and agricultural fields. Deforestation mostly results from fuel-wood gathering and livestock grazing in the miombos. The use of fire to regenerate grasslands is practised haphazardly and frequently resulting in a decreasing fertility of grasslands for livestock grazing (Hazelhurst & Milner, 2007). Farmers in the catchment areas typically grow staple crops such as cassava and beans, but also earn some money from the sale of cash crops such as tobacco, maize, and rice. Rice paddies are located in the mbugas (Planning Commission Dar Es Salaam, 1998).

Detailed survey of KV (similar to the above) is currently underway in connection to ongoing MS thesis work and the start up of research.

Monitoring and Data

For MM, the main physical data is from the Tanzanian Meteorological Agency in Dar Es Salaam. The daily precipitation data is available for four cities which are Tabora (5°01’13.96’’S 32°48’16.32’’E), Urambo (5°04’17.12’’S 32°04’13.99’’E), Nzega (4°12’54.51’’S 33°11’07.57’’E) and Kasulu (4°34’22.28’’S 30°05’48.44’’E), they are all situated in the Malagarasi-Muyovosi catchment area. The length of the data is varying regarding the cities but three of them (Tabora, Nzega and Kasulu) cover the period 1970-2003, while the Urambo record covers 1978-2003.

The temperature data currently in hand consists of monthly records for two stations, with the mean minimum temperature and mean maximum temperature for every month between year 1970 and 2003 available. Tabora station (5°01’13.96’’S 32°48’16.32’’E) is located in the Malagarasi-Muyovosi catchment area and the other station, Kigoma (4°53’02.80’’S 29°40’07.16’’E), is located on the shore of Lake Tanganyika.

For KV, there are several climate stations, stream gauges and groundwater wells in the area. We are currently accessing this data and undergoing quality control.

Publications

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