

Sustainable Management and Conservation of Wetland Resources in Uganda: A Review

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Abstract

Wetlands cover 30,105 km² of Uganda's total land area of 241,500km². With the coverage of 13% of the total land area, they represent one of the most vital ecological and economic resources the country is endowed with. Unfortunately their importance is associated only with the direct consumptive use value like crop cultivation, human settlement and extraction of useful materials. The essential life support processes for example stabilization of hydrological cycle and microclimates, protection of riverbanks, nutrient and toxin retention and, sewage treatment are the least recognized. Destruction of these ecosystems is a serious environmental problem the country is currently faced with. The problem has reached alarming levels in Eastern Uganda where about 20% of wetlands have been destroyed. The underlying cause of this destruction is the insatiable desire of the poverty stricken population to derive livelihood from the wetlands. Some evident impacts of wetland destruction include adverse local climate modification which has contributed to 2-meter drop in River Nile and Lake Victoria water levels.

The other impacts are seasonal flooding and destruction of biodiversity and associated ecological processes. In attempt to address the problem, fairly comprehensive wetland legislation comprising the National Wetlands Policy 1995, the National Environment Statute 1995, the National Guidelines for Wetland Resource Developers 1995, and the National Environment Regulations 2000 (wetlands, River Banks and Lake Shore Management) have been put in place. The government has also established a national wetland inspection division to specifically deal with wetland management. Internationally, Uganda ratified the Ramsar Convention and has designated two internationally recognized wetlands as Ramsar Sites and in November 2005 Uganda hosted the 9th Ramsar Conference on wetlands. However, implementation of these measures is still at infant stages and is faced with many challenges like inadequate funding, political interference and limited awareness of the population on the existing wetland legislation and multivariate value of wetlands especially the ecological ones. Sensitization and educational programs to empower local communities with knowledge and awareness particularly on the ecological roles of wetlands need to be scaled up to influence a positive shift of attitude and practices towards these ecosystems.

Keywords: Sustainable management; Conservation; Wetland resources; Uganda

Introduction

Wetlands are defined as any permanently or seasonally wetland in valleys, depressions, or floodplains with open herbaceous vegetation, mainly grasses and sedges and an absence of trees (FAO, 1996). The common wetlands are open coasts, flood plains, fresh water swamps, lakes, peat lands and swamp forests (Mironga, 2005). Wetland ecosystems are the most diverse and productive ecosystems on Earth and include marshes, lakes, rivers, flood basins, estuarine deltas, ponds, rice fields, and marine water areas where the depth at low tide does not exceed 6 m (Convention on Wetlands, 1971).

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Wetland ecosystems are important from conservation and sustainable management viewpoints due to their rich diversity of flora and fauna. Tangible and intangible diverse resources and products of wetland functions such as fodder, fishes, fuel wood, non-timber forest products, ecotourism, and flood control provide a source of income and livelihood for human beings. However, population growth and associated anthropogenic interferences have depleted these resources and reduced the rates of flow of the ecosystem services. The loss of wetland ecosystem services damages the health and well-being of individuals and local communities and diminishes their development prospects (Millennium Ecosystem Assessment, 2005). This problem is of serious concern in many countries where ethnic communities are highly dependent on wetland resources. The problem is severe in countries with weak policy and management strategies, negatively affecting the conservation and sustainable management of wetland resources.

Wetlands as Source of Livelihood

It is widely recognized that wetlands provide several ecosystem services that contribute to human well-being. The major ecosystem services that wetlands provide include fish, fibre, water supply, water purification, climate regulation, flood regulation, coastal protection, recreational opportunities, and tourism (Millennium Ecosystem Assessment, 2005).

Worldwide, wetlands are known for their ability to support a large human population. A number of authors (Maltiby, 1986; Dugan, 1990; Kamukala et al., 1993) stress that wetlands are, and will continue to be essential to the health, welfare and safety of people. Wetlands in their natural state provide products for people (Wood, 2002).

The recognition of the wide range of ecological and economic benefits that natural wetland ecosystems provide to humans (Turner, 1991) has prompted increasing interest in the construction of human-made wetland ecosystems, which simulate the functions of natural wetlands in order to support human use (Hammer and Bastian, 1989). Wetland ecosystems are generally constructed with the aim of replicating wetland processes such as water storage, flood retention, and water quality improvement for human benefit (Kadlec and Knight, 1996).

The role of wetland resources in the livelihood of the poor is particularly important in developing countries. For example, in Uganda it provides > 50% of the monthly income of the dependent population (Opio et al., 2011).

In Uganda these include marshes, swamps and bogs. Wetlands occur all over Uganda and cover an area of 11 % of the land as follows: seasonal wetlands (7.7%), permanent (3.4%) and swamp forests < 0.1 % (MWE, 2013). At least 69 % of the total area under wetlands comprises impeded drainage, while swamps constitute 30 % and swamp forest, 1 % (NWCMP, 1991). There are two broad categories of wetlands, namely, those which are associated with lakes (lacustrine) and rivers (riverine). The lacustrine include: the Kyoga/Kwania Complex; Lakes George, Edward, and Albert; Bunyonyi Lake/Swamp Complex; Bisina and Opeta; Wamala; and other minor lakes. The riverine swamps include: the Okele, and Kafu Systems. The wetlands can further be differentiated based on altitudinal variations, as follows:

- above 3,000 m: swamps, bogs, and mires of mountainous areas like Rwenzori and Elgon mountains;
- 1,900-3,000 m: valley swamps (peat) of Kabale, as well as upland swamps in Bwindi forest, papyrus swamps, sedge-dominated (including *Pycneus* swamps, and *Syzygium* swamp forest);
- permanent swamps: *Cyperus papyrus*, sedges, *Typha*, swamp grasses, and swamp forest;
- Seasonal wetlands and temporary pools.

Wetlands in Uganda have been put under many uses since time immemorial including: hunting and fishing; shifting cultivation including rice growing; grazing; brick-making; and harvesting raw material for building houses. Other related primary roles and functions of wetlands include: sediment, nutrient and toxin retention; stabilization of the hydrological cycle and micro-climate (for example, Kiruruma valley in Kabale district, and the montane bogs of Rwenzori Mountains); biological diversity (habitat) and species richness; and biomass production (papyrus/reeds) Table 1.

Table 1: Categorization of wetlands by functions

Function (s)	Examples of Wetlands
Ground water recharge/discharge	Kiruruma valley, Kabale, Rwenzori montane bogs
Sediment and toxins retention	Lake George, Bushenyi and Masaka wetlands
Nutrient (Effluent) retention	Nakivubo and Luzira swamps, Kampala
Biomass export	Lake Victoria, lake George, Lake Kyoga swamps
Micro climate stabilization	Kabale district valley swamps
Water transport	Effluent arms of Lake Kyoga
Recreation and tourism	Lake George wetland

Source: *Wetlands and Water birds of E. Africa*

Major drivers of wetlands degradation in Uganda

Population explosion: The growing population is a major factor driving encroachment into wetlands for settlement, agriculture and for other resources. The recent census indicates that the population is growing at a rate of 3.2 % per annum and has almost tripled from 12.6 million in 1980 to 34.8 million in 2014 (UBOS, 2014) and estimated to be 45 million people in 2019. The country is rapidly urbanizing with the rate of urbanization at 6.6 % in 2014 (UBOS, 2014). The high population creates high demand for land and enormous pressure on the natural resources for food, medicines, fuel wood, clay mining for bricks and other raw materials.

Socio-economic pressures: The extent of wetlands encroachment is directly related to proximity to built-up area and roads, population density, market accessibility and market influence (Lwasa, 2005). Roads close to swamps offer an easy means to transport wetland goods to market. Erratic development plans also encourages wetlands degradation with investors and even government institutions being licensed to develop wetlands.

Industrial development: Wetlands have traditionally been seen as vast, cheap and unencumbered land available for development. The allocation of wetlands for industrial development, for instance through the Kampala Development Plan 1972 set the stage for wetland's encroachment in most parts of the country. Industries put pressure on wetlands through heavy pollution burden and drainage for infrastructure development. And recently most wetlands including Namanve swamp in central Kampala have been given to investors for industrial establishment for flood control, receiving effluents and climate modification and so forth.

Nature and Management of Wetlands in Uganda

During colonial and immediate post-colonial eras (before 1986 and after): In the colonial period (before 1962), the wetlands were designated as reserves. Much as the wetlands legally belonged to the central government, the traditional institutions through monarchical systems played a big role in their protection. These were almost exclusively based on traditional beliefs and spiritual attachment. With political changes since independence, the powers of traditional institutions were reduced and lost direct control over these resources. The communities also lost the sense of attachment to such resources. Consequently, it became difficult to understand the definite tenure and property arrangements of wetlands.

The RAMSAR Convention: Uganda became a signatory of The Ramsar Convention in 1987 for addressing the issues of the loss and degradation of wetlands by designating sites of international importance and making use of them (UNEP, 1988). The Convention is to address wetland issues at national policy level; and, at the level of individual Ramsar Sites (e.g. Lake George) through the National Wetlands Policy. Already, a national wetlands inventory has been conducted, and a national wetlands database established. The objective is to enhance monitoring of changes in the status of the country's wetlands resources.

Some of the wetlands proposed for protection as conservation areas with limited human use involving mainly controlled harvesting of resources are outlined below.

- Kachindo wetlands (Lutembe bay) with its abundant bird life. Its association with Lutembe beach makes it a tourist attraction. It is also a site that offers potential research opportunities on natural wetlands and their associated faunal and floral endowment.
- Nabajuzi wetlands (in Masaka municipality) for its water supply and as a habitat to wildlife in Sitatunga.
- Nakivubo and Kirinya swamps for their effluent water purification roles.
- The Sango Bay system which is the only extensive area of swamp forest in Uganda and has a diverse mosaic of wetlands vegetation. It provides a wide range of habitats for birds and mammals (including elephants); and, opportunities for sustainable use of resources by the local people such as grazing, cutting of grass, fishing, and timber extraction.
- The narrow strip of wetlands fringing the lakes to act as a buffer between the adjacent land activities and the lakes.
- Riverine wetlands whose waters feed directly into Lake Victoria and whose waters receive effluent from urban areas.

Another example is the Kooki Lakes Complex that receives effluent from Mbarara town via the River Rwizi.

Legal policy and institutional developments

1. In 1986, the Ministry of Environment Protection was established and it banned further wetland conversion until a National Wetlands Policy would be developed.
2. In 1988, the government of Uganda ratified the Ramsar Convention of 1971 on wetlands of international importance. Uganda is one of the parties with the largest surface of wetlands covering almost 30,000 km² (IUCN, 2005). In response to the requirements of the Ramsar convention Uganda has designated Lakes George and Nabugabo as Ramsar sites. Seven others are in the final stages of listing as Ramsar sites. A biocentric approach of ecosystems management is emphasized in the two Ramsar sites. Each of these sites has a management plan to combat wetland and biodiversity loss, while ensuring that benefits accrue to adjacent communities. Uganda also hosted the 9th Ramsar Conference on wetlands in November 2005.
3. In 1989, the government established the National Wetland Programme (NWP) under the Ministry of Environment Protection to develop a national wetlands policy to guide the use of wetland resources in the country. From then, NWP carry out sensitization and awareness campaign and consultation to enlighten the public on values and functions of wetlands and the need for their conservation and sustainable use. NWP also put in place a national wetlands inventory. However, the inventory is not comprehensive enough as it does not indicate which wetlands are managed sustainably.
4. In 1995, the Constitution of the Republic of Uganda 1995, guaranteed a place for the environment among the fundamental rights and freedoms of all people by providing every Ugandan citizen a right to a clean and healthy environment. The Constitution mandates the state to protect important natural resources, including land, water, wetlands, oil, minerals, fauna and flora on behalf of the Ugandans (Chapter XIII of the Constitution 1995). The Constitution encourages involvement of the public in the formulation and implementation of development plans and programs affecting them. Public participation is required in enactment of laws to promote environmental awareness and preserve the environment from abuse, pollution and degradation.
5. In 1995, the government adopted the National Wetlands Policy. The objectives of the Wetlands Policy are to enhance equitable distribution of wetlands benefits to all stakeholders. This policy describes how the government intends to deal with Uganda's wetlands. However there was no enabling law for its implementation. As a result in subsequent years, this led to enactment of laws such as the National Environment Statute (NES) 1995, the Local Governments Act 1997, the Land Act 1998, the Water Statute 1995 and The National Environmental (Wetlands, River Banks and Lake Shores Management) 2000. These reinforce and give further details of specific aspects of wetland management.
6. In 1995, wetlands were incorporated in the National Environment Statute, 1995. The National Environment Statute (NES) addresses all aspects of biological diversity conservation and brings together all sectoral environmental agencies involved

in the management of the environment under one forum to take collective decisions on environmental matters. The NES also provides various environmental legal requirements that are relevant to the sustainable management of wetlands. Some of these include:

- (a) The application of Environmental Impact Assessment (EIA) started in 1997 after its adoption by the National Environment Management Authority (NEMA). Since then, proposed developments in the wetlands have been subjected to EIA process to determine progress of such developments in addition to identification of the required environmental mitigation measures. This however, targets large-scale activities. Small-scale activities have potential cumulative negative impacts over time are not subjected to EIA.
 - (b) Environmental Audits are subjected to ongoing projects to determine the extent of their impacts on the environment and whether the degraded wetland can be restored.
 - (c) In July 2004 NEMA issued environmental restoration orders to wetland encroachers and in January 2005 it demolished a house that had been built in a wetland. This was an important event that demonstrates that wetland abuses would not be tolerated even from politicians. Requests for advice among project developers on how to utilize wetlands and whether to buy land or not have increased due to that sanction.
 - (d) Use of Environmental Easements is meant to facilitate the conservation and enhancement of burdened environment through imposition of some obligations. This has not yet been practically applied.
7. In 1997, wetlands were included in the Local Governments Act. This Act devolved wetlands management to district authorities for effective management purposes. They cannot however sell, lease or alienate wetlands under their jurisdiction. Districts manage wetlands according to all other relevant laws and legislation including the Constitution 1995, the National Environment Statute 1995, and Wetland Policy 1995. Technical officers mandated to implement wetland management activities have been appointed by the districts as provided for in the Local Governments Act, 1997. However, their capacity to effectively deliver is constrained by inadequate funds and political interference.
 8. The Land Act 1998 deals with issues of land ownership. According to this Act Wetlands in Uganda are 'held in trust' by Government and local Governments for the good of the citizens of Uganda in accordance with the Constitution 1995. Just like the Local Governments Act 1997, the Land Act 1998, also devolved responsibility of wetland management to the district authorities. There is however limited awareness about its provisions and therefore local communities still laid claim on wetland areas.
 9. In 2000, the National Environmental (Wetlands, River Banks and Lake Shores Management) Regulations, 2000 were developed and enforced. These Regulations recognize the ecological relationship among wetlands, rivers and the lakes. This provides integrated approach in the management of these ecosystems. These Regulations prohibit central government or local governments from leasing out or otherwise alienate any wetland. This has however been abused. For ex-

ample, the Ex-Army Officers (Veterans) in 2006 established a market in a wetland located in Wandegeya – a Kampala city suburb without carrying out Environmental Impact Assessment. This was a politically sensitive issue, which seems to have deterred intervention from the institutions implementing the wetland legislation.

10. The country implemented the National Wetland Sector Strategic Plan 2001- 2010. The vision of the Strategic Plan emphasized wise use to allow wetlands to provide sustainable benefits to the population of Uganda as a whole, mankind in general and the environment in the long-term and since then there has been several adjustments and reviews of all these Acts, policies and laws to ensure effective and sustainable wetland conservation in the country.

Conclusion

For a very long time, ownership of wetlands has been vaguely defined. The seemingly unwritten policy since the 1950's encouraged more or less controlled swamp drainage for pasture and growing of crops. It has been realized that ownership of wetlands is the most important factor affecting the management of wetlands; and this has been influenced by the prevailing land tenure systems (customary, mailo, freehold, and leasehold). Uganda's experience in wetland management has been interesting. Since 1986, a number of landmarks have been made in legal and institutional development in response to serious wetlands destruction. The Constitution and the subsequent laws are quite realistic and impermeable. The requirement for Environmental Impact Assessments for example has been used as a decision making tool in the use of some wetlands. However, a number of limitations and challenges such as political interference, corruption and general lack of awareness among the public on the multivariate values of wetland and the existing legislation still need serious attention. The under staffing in institutions, inadequate funding and limited coordination among the different sectors involved in the management process should also be addressed.

Recommendations

A specific wetland law and general sensitization of the general public is required to give focus and attention of the general public to wetland management and conservation.

More capacity building is required at district and lower levels to enable communities to increasingly take up the responsibilities of wetland management under the decentralized system of governance. This can address the funding constraints and inadequate staffing.

There is need for the various sectors involved in wetland management and conservation to put in place a memorandum of understanding to avoid poor coordination and institutional overlaps.

The scope of projects subjected to Environmental Impact Assessment should be widened to cover small-scale activities which collectively have significant negative impact on the wetland environment.

Knowledge-based building through research should be encouraged and with effective dissemination where the general population can be educated on wetland management and conservation issues.

The Government of Uganda and United Nations Development Programme (UNDP signed a financing agreement for the Green Climate Fund (GCF) project August, 2017 to restore degraded wetlands, improve ecosystems, strengthen climate information and early warning systems. This development should be followed and put into practice to ensure that the project's objectives are successfully met.

Conflict of Interest: The author declares no conflict of interest.

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