

An overview and scope of Tanzanian wetlands

G .L. Kamukala

Director General
National Environment Management Council P.O.
Box 63134
Dar es Salaam

Introduction

Tanzania is very rich in wetland resources which include the Great Lake systems, major river networks and deltaic mangroves. The major lakes and floodplains have long provided a fertile resource base as they include alluvial plains of great agricultural potential.

Wetlands in Tanzania support an extensive trading and transport system, fishing grounds, agro-pastoral activities, hydrological processes and, more recently, the harnessing of the river flows for irrigation and hydroelectric power.

As wetland systems are developed, multiple values inherent in these systems are either ignored or underestimated during their planning in favour of a single interest or sector. With hindsight, there is increasing awareness not only of the free benefits accruing from intact wetland systems but also of the social, environmental and socio-economic costs of disruption of those systems. Degradation and loss of natural systems can increase the already intense pressures on rural communities.

Well managed, these productive ecosystems can help meet the needs of a rising population with increased demands and can alleviate environmental problems.

Overview of Tanzania's wetlands

General outline

Tanzania is the largest country in East Africa and she enjoys a significant proportion of the wetlands. The Indian Ocean coast is 1,000 km long with a highly indented coastline. In the southwest, there is a shoreline of 305 km on Lake Nyasa and another of 650 km on Lake Tanganyika in the west. To the northwest, 1,420 km of Lake Victoria's shoreline lies in Tanzania (NEMC/WWF/IUCN,] 990).

Wetlands of Tanzania

Tanzania is drained by a number of rivers and streams. Because of the general declination from the western and central highlands towards the coast, much of the country drains to the ocean. A few large rivers drain away from the coast, for example, the Kagera and Mara Rivers drain into Lake Victoria and the Malagarasi River drains into Lake Tanganyika. Swampy basins and floodplain wetlands are common in Tanzania; estimates indicate that almost 10% of the country's surface area is covered by wetlands (NEMC/WWF/IUCN, 1990).

The principal wetland systems are: the Western and Eastern Rift Valley lakes, Lake Victoria, numerous minor lakes, riverine floodplains and permanent swamps, coastal mangrove systems with intertidal mudflats, and a number of artificial impoundments constructed for hydropower and irrigation.

Approximately 2.7 million hectares are covered by areas of permanent or seasonal freshwater swamps and seasonal floodplains, distributed over almost all of the country's major river systems. Another striking feature is the mangrove forests which support a richly varied environment and occur along the Tanzanian coast from the Kenyan border in the north to the Mozambique border in the south.

Wetland values and functions

Research and surveys have provided empirical evidence to show that wetlands are among the most productive ecosystems of Tanzania (Lorna, 1979; LRDC and aDA, 1987; Bwathondi and Ngoile, 1990; Mwalyosi, 1990; Semesi, 1990). These fabulous natural resources are continually being depleted and only rarely is sustainable utilisation considered. Wetlands are multifunctional with diverse values and functions. They include agricultural, hydrological, ecological, logistical and social values.

Fisheries

It is estimated that over 110,000 artisanal fishermen are engaged in the fishing industry (DANIDA, 1989). The fishery potential in the large lakes is not known, while fish biomass in Tanzanian coastal waters is 100,000-200,000 t. Swamps, rivers and reservoirs play a very important role in total fish supply because of their wide distribution throughout the country. Mangroves, estuaries, deltas and shallow offshore waters are vital for maintaining coastal finfish, shrimp and mollusc fisheries.

Agriculture

In many floodplain areas rice has been grown for centuries. Maize is often grown as a flood recession crop during the dry season. Most of these crops are grown without additional fertilisers and rely on the natural fertility of wetlands and alluvial soils.

Irrigated systems seek to intensify rice production using improved varieties, mechanised techniques, improved water management and appropriate fertilisers

and pesticides. Other crops, such as cotton and sorghum perform well in lowlands which have black cotton soils and silty soils respectively.

Livestock

Wetlands play an important role in the ecosystem supporting livestock herds, especially in the semi-arid grassland areas. Floodplains in the northern part of the country can support densities of 1-2 head/ha. This is because the dynamics of floodplain systems continually makes new pastures available as others dry out; cattle are thus permanently on the move and cause less damage than if they remained in one location. Extensive herding could be an excellent use of floodplain resources during the dry season and, if adequately planned and controlled, can be completely compatible with other land uses.

Hydrology

Wetlands, when in their natural state, can play an important role in the water cycle through their numerous functions summarised below:

1. Groundwater recharge

Water filters down *from* the wetland into an underground aquifer which stores potable water.

2. Groundwater discharge

Water that has been stored underground moves out of the aquifer to become surface water.

3. Flood control

By storing precipitation and releasing the water slowly, wetlands can diminish the destructive effects of flood crests downstream.

4. Nutrient cycling

Wetlands can filter and recycle soil nutrients, preventing eutrophication of rivers and lakes.

5. Micro-climate stabilisation

The overall hydrological, nutrient and energy cycles of wetlands may stabilise local climatic conditions, particularly rainfall and temperature. This in turn influences agricultural or resource-based activities (Dugan, 1990).

6. **Storm protection and shoreline stabilization**

Mangrove forests help to dissipate the force of storms and lessen damage to the ecosystem. Wetland vegetation can stabilize shorelines by reducing the energy of waves, currents, or other erosive forces.

7. **Biomass export**

Many wetlands support dense populations of fish, cattle or wildlife which feed on the nutrient rich waters, substrates, or graze on the lush pastures.

8. **Sediment retention**

Although it is upland areas which suffer soil loss, it is the downstream system which has to cope with high sediment loads. In 1990, torrential rains clogged otherwise fertile fields in the southern zone of Tanzania.

Wildlife resources

Many of the species which have made Tanzania renowned for its wildlife are migratory and have well-defined dry and rainy season habits which include wetlands. Many wetlands are rich in wildlife which provides important recreational and food resources and commercial products including hides, skins and trophies. Unfortunately, human activities have caused some species to become endangered while others are threatened with extinction.

Water supply,

Wetlands have always been a source of water for human and livestock consumption, and to supply agriculture and industry. They are often oases in areas of low rainfall, making such places habitable.

Biological diversity

Many wetlands support spectacular concentrations of flora and fauna. For example Lakes Victoria, Tanganyika and Nyasa support over 700 species of endemic fish (NEMC/WWF/IUCN, 1990). Moreover, wetlands are important as genetic reservoirs for certain plant species, including waterlilies and wetland rice. Without proper conservation many species could be lost.

Threats to wetlands

The following activities are threats to the integrity of wetlands in Tanzania:

1. Cutting of aquatic and other vegetation for fuel, housing, commercial activities, etc.
2. Overgrazing and overcultivation by pastoralists and farmers.
3. Illegal and improper fishing practices.
4. Pollution by domestic sewage, industrial effluent, and agro-chemicals.
5. Development activities, including dam construction, coastal development, mining and quarrying.
6. Eutrophication may be caused by point 4 and leads to oxygen depletion.
7. Establishment of new human and livestock settlements.
8. Hunting and killing of wildlife.
9. Introduction, illegally or otherwise, of non-traditional or alien species into wetlands (e.g. water hyacinth, Nile perch).

Major issues in wetland development

To halt or minimise degradation of wetland resources, legislation must be linked to an improved understanding of the resources and ecosystems. This entails increased public sensitisation and awareness of the benefits of wetlands. The caB for crosssectoral awareness of wetland values and functions is important. Projects need centralised or inter-ministerial coordination to ensure harmonised endeavours. Environmental assessment should be carried out for the sustained management of development projects.

People should be made to appreciate the true socio-economic, biological and scientific importance of wetlands and assisted to change from a harvesting to a management approach. In order to change national policies, which are deficient in the promotion of wetland conservation, a policy which takes care of sustainable wetlands management is already under way. Many wetlands are lost because of faulty planning methods. Inter-sectoral planning, which involves appropriate tools and approaches, should be developed to facilitate this process.

There is not enough data on wetland ecosystems, their functions or their possible responses to different forms of development pressure. More information is needed in order to ascertain the extent of wetland development and utilisation, and to establish wetland monitoring.

Conclusion

The wetlands scattered throughout Tanzania are the product of many years of geological, hydrological and climatological processes, combined with the activities of living organisms and overlain by human land use patterns. Wetland management should take into account the dynamic nature of wetlands. Therefore, for any changes to be effective, the wise use of wetlands requires a broad view of all parties concerned.

Sectors with activities related to the utilisation of wetlands should join hands. It is thus expected that participants at this meeting will generate recommendations on how wetland conservation should become part of the national conservation effort.

Plans for the wise use of wetlands should be coordinated to include a whole basin approach (including uplands and coastal areas) for management and protection of the complex and diverse systems. The understanding of wetlands, as highly productive ecosystems with a wide range of functions which are important to people, is growing along with the recognition that losses and threats to these systems have severe consequences.

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