Wetland Action

STRIKING A BALANCE

Policy Briefing Notes

5. Wetland Use as an Adaptive Response to Climate Change in E & S Africa: Sustainable Wetland Management & the Functional Landscape Approach

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KEY POINTS

- **Wetlands are key resources for adapting to climate change in East and Southern Africa.**
- **Increased cultivation of wetlands is a common adaptive strategy already, but with this comes the threat of wetland degradation.**
- **The "Functional Landscape Approach" can help communities sustain the multiple benefits from wetlands.**
- **A win-win scenario for wetlands and catchments, livelihoods as well as the environment, has been developed & tested in sites in East & Southern Africa.**

Wetlands are areas where for some part of the year the water table is above or near the surface. They include swamps and seaonlly flooded valleys such as *dambos*

Multiple use of wetlands for some combination of dry-season cropping, fish farming and the collection of craft, medicinal and relish plants is an increasingly common adaptation to the impacts of climate change.

SUMMARY

Wetlands are a key resource which, if properly managed, can help communities cope with climate change and mitigate negative effects. They are often important stores of carbon which will be released if these areas are degraded. Less secure harvests due to climate change will lead to increased use of wetlands for agriculture. While this is an increasingly common adaptive strategy, it can increase the chances of wetland degradation, and so undermine livelihood benefits and the storage of carbon.

A coordinated response, which can ensure both increased and sustained wetland agricultural production, as well as maintaining the environmental functioning of these areas, has been developed at sites in East and Southern Africa. This "Striking a Balance" approach focuses on the re-establishment of a "functional landscape" recognising the links between upslope areas and wetlands, and the importance of the infiltration and retention of water. The approach is based on enhanced local knowledge and should be linked to village institutions to ensure socially fair, and ecologically sound and sustainable land management for wetlands and catchments.

1. Climate Change in East and Southern Africa

The greatest threats to the well-being of people and the development of livelihoods in East and Southern Africa are the predicted impacts of climate change. According to the Inter-governmental Panel on Climate Change, Africa can expect more erratic rainfall, longer dry spells and a shorter growing season. In addition, temperatures, and evapo-transpiration will increase, while storms will be more severe, and heavy rainfall more concentrated.

The impacts of climate change will be made worse by the environmental degradation which has occurred in many parts of the region. Natural vegetation cover has been reduced as land is cleared for farming or for fuelwood collection, and in many places this leads to increased runoff and erosion. Erosion from farmland has increased especially where repeated hoeing and ploughing have caused soil compaction and so caused reduced infiltration of rainfall.

Land degradation together with climate change will inevitably lead to poorer harvests from rain-fed fields in the uplands, increased erosion and loss of top soil from these catchments, and growing deposition of sandy sediments in stream valleys and wetlands. Worsening food insecurity, poorer nutrition and declining water supplies, mean that the incidence of ill health will increase. In particular, the development of AIDS, amongst people who are HIV positive, will accelerate. This situation will worsen the burden on women as the providers of fuelwood, relish (non-starch food items such as vegetables) and domestic water. For many people climate change will mean a spiral of deteriorating conditions and declining well-being unless adaptive and mitigating strategies are developed.

2. Wetlands and Adaptation to Climate Change

While some reports suggest weak adaptive capacity in Africa, there are many people adapting to climate change already. One widely adopted practice has

WETLANDS INTERNATIONAL

The SAB project was a demonstration project of the Wetlands and Poverty Reduction Project of Wetlands International (2006-2008). The Project was carried out with financial support from Wetlands International under its Wetlands and Poverty Reduction Project . This was financed by the Netherlands' Ministry of Foreign Affairs (DGIS). This PBN was developed subsequently by Wetland Action and draws on data from the SAB work and from the experience of other Wetland Action projects in Eastern and Southern Africa.

been the use of wetlands for cultivation, with the fringes of large permanent wetlands and extensive parts of smaller seasonal wetlands brought into use. Indeed, wetlands are a "new agricultural frontier" in Africa today.

This trend will accelerate as the impacts of climate change intensify. Wetlands will be increasingly attractive because the availability of water can ensure several successful harvests in a year, especially in the dry season when food is scarce. The inherent fertility of most wetland soils will provide an added attraction as expensive chemical fertilisers are not needed. These reliable harvests, achieved at little direct financial cost, can be critical both for food security and for building economic assets, when crop surpluses can be sold. Indeed over the next few decades, wetland agriculture will be one of the most commonly applied adaptations to climate change, and one which many rural households can use. Hence, although wetlands account for less than 4% of the area in many East and Southern African countries, the food security contribution they make means that these areas are becoming vastly more important than their size suggests.

Intensive vegetable cultivation is now widespread in seasonal wetlands using residual moisture

3. Threats to Wetlands under Climate Change

However, wetlands are fragile and as agricultural intensity increases in these areas there will be a growing danger of degradation. This will undermine livelihood activities and can often involve the release of carbon where drainage occurs. Hence there is a need for further adaptation by developing land husbandry practices and management methods which can maintain these valuable areas with their specific ecosystem services.

The pressures on wetlands will come from four different directions as climate change intensifies:

1. less rainfall will mean that wetlands decline in size, and become drier, assuming no other changes occur;
2. the expansion of wetland agriculture may lead to increased extraction of water from wetlands and growing desiccation of these areas;
3. overuse of soils for cultivation will make these areas less fertile and make them more prone to erosion, especially if the cultivated areas are extensive and include the middle of the wetlands where gullies typically form; and
4. increased erosion from degraded uplands / catchments, as a result of more intensive rainfall, will lead to increased sediment deposition in the wetlands burying the fertile soil.

Treadle pumps extract more water from wetlands & require monitoring

Together these developments will reduce the utility of wetlands for cropping and domestic water supply, and so undermine one of the key adaptive strategies of rural communities in the face of climate change. This scenario will also intensify the situation reported in the Millennium Ecosystem Assessment where wetlands were identified as the most seriously degraded and threatened ecosystem.

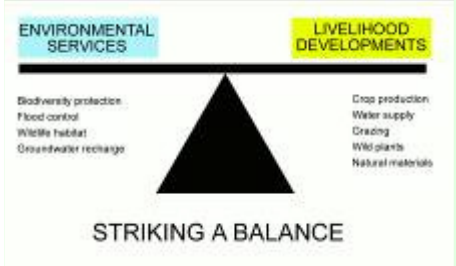
Gulley formation is common in wetlands which are overused and where there are degraded catchments

Wider implications of wetland damage are the loss of the environmental functions of wetlands such as the reduction in flood peaks, the recharge of aquifers, and the storage of carbon - mostly in permanent wetlands. Wetland loss will also have biodiversity implications as the ecological gradations around wetlands are vital for the survival of many wild plants, birds and animals.

Another threat to development goals due to wetland use may come from the way communities respond to the situation of increasingly scarce resources. Access to wetlands will be increasingly valuable as farmers want to supplement their declining rain-fed harvests, either by growing crops for domestic use in a subsistence manner or by growing ones for sale. This is likely to see increased "privatisation" of formerly "open access" resources by a rural elite, and increased differentiation in rural society.

Afforestation of degraded upland sites is one of many land management measures which can be applied to improve water storage in catchments

Maintaining natural vegetation in the centre of wetlands is essential for protecting these areas

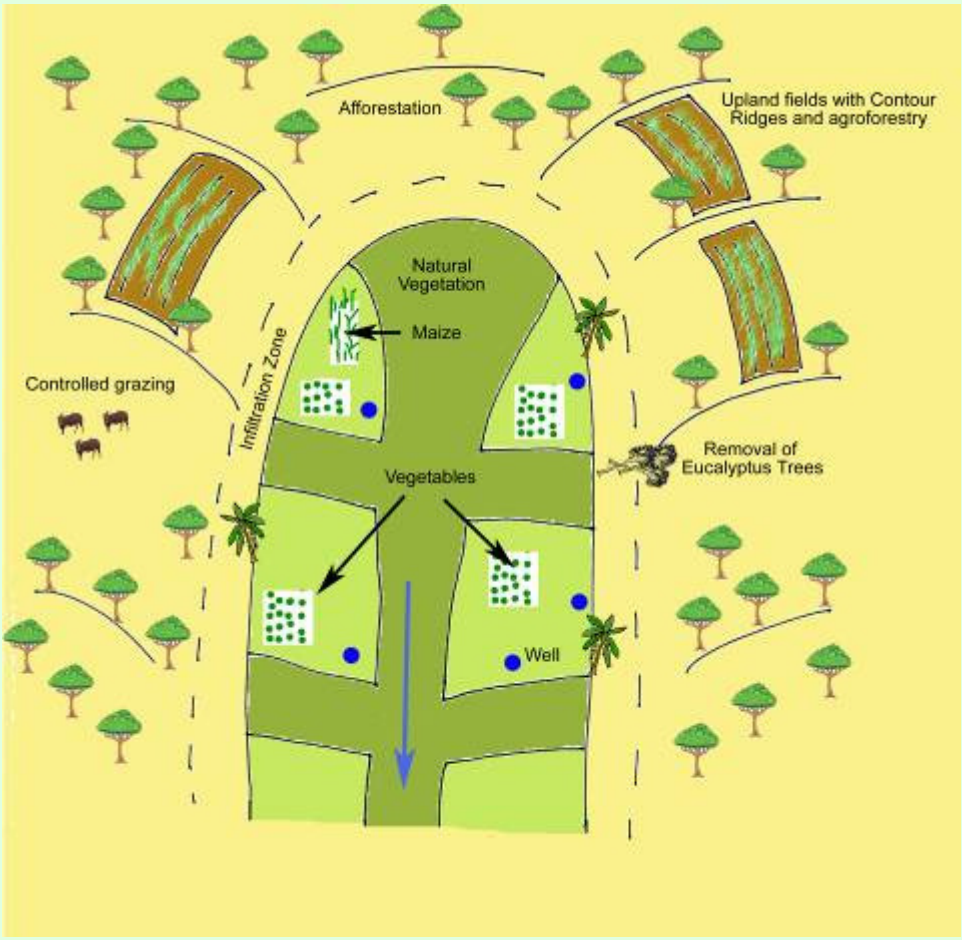


The SAB approach seeks to encourage management practices which allow the sustainable use of wetlands for livelihood development while maintaining environmental services.

4. Sustaining Wetland Use and Environmental Functions under intensifying Climate Change

The challenge with this already unfolding scenario is how to maintain access to these critical wetlands for the bulk of rural society and how to sustain and enhance other livelihood benefits from these areas, while maintaining their ecosystem services, despite the adverse effects of climate change.

The "functional landscape approach" offers a coordinated and community-based way of addressing the environmental, livelihood and social issues being faced. This approach has been developed through the accumulation of the local knowledge from communities using permanent and seasonal wetlands in several different parts of eastern and southern Africa. It draws on local conceptualisations and understandings of wetlands and their functioning which are well established in these societies.



A functional wetland and catchment landscape

The functional landscape approach has four major elements:

A. Catchment- Wetland Linkage

The understanding of the link between catchment and wetlands is critical. Good land management in the upland, rain-fed fields and catchments, with soil and water conservation measures and conservation agriculture, will reduce runoff and erosion, and improve infiltration of rainfall and water storage in these areas. This will help increase the period for which water is available in the wetlands. An infiltration zone of natural vegetation at the wetland / upland interface can also act as a buffer for sediment deposition and a biodiversity adaptation area.

B. Land Management of the Wetlands

Managing the pattern of cultivation in the wetland, especially avoiding creating

SAB APPROACH

The SAB model has five elements:

- developing understanding and building on local knowledge;
- formulating key concepts of wetland – catchment linkage, and using them to guide action;
- applying technical measures to add value to wetlands and sustain their value;
- building local institutions to strengthen wetland management;
- influencing the policies to support the farmers' perspective. (See PBNs 1, 2 and 4).

Wetland food production is helping improve the nutritional status of communities, especially children and adults suffering from HIV/AIDS.

STRIKING A BALANCE
POLICY BRIEFING NOTES (PBN)

1. **Valuing wetlands for livelihoods as the basis for sustainable management: the SAB Approach**
2. **Local institutions and wetland management**
3. **Ecological assessment of wetland health to guide sustainable use**
4. **Wetland policies and policies for wetlands**
5. **Wetland use as an adaptive response to climate change**

gardens or wells in the centre, can help reduce the risk of gully formation. Keeping natural vegetation in key areas, such as the wetland centre, can help maintain the wetland micro-climate, as well as other contributors to livelihoods such as fish, wild relish plants and natural plants used for crafts (e.g. reeds).

C. Community Organisation

Coordinating land use in the wetland and catchment requires pro-active measures. These are best achieved through a Village Natural Resource Management Committee (VNRMC), a sub-committee of the existing Village Development Committee. This reports to the village headman and through him to the chief. Such elected committees can undertake training, demonstration activities and organise community actions – such as afforestation or land management, to achieve a functional landscape. They should develop by-laws for land management and to ensure equitable access to wetlands.

D. Incentives System

Critical in supporting the development of a functional landscape is the creation of economic incentives from sustainable use of the wetland which motivate community members to follow the guidance of the VNRMC. In this approach developing an understanding of the environmental processes and catchment-wetland linkages is critical, especially the way good land management in the upland fields can support increased wetland crop production and livelihood improvement. Overall a win-win situation can be created from these incentives, rather than from external support - such as payment for environmental services.

5. Creating a Positive Landscape Scenario with Climate Change

Sustaining wetlands as functioning ecological units is essential for mitigating the livelihood and environmental impacts of climate change and developing appropriate adaptive strategies. To achieve this, the SAB approach for integrated wetland and catchment management has been developed and tested. It seeks to re-establish functional landscapes and help communities develop the social institutions and environmental understanding needed to apply these ideas.

FURTHER INFORMATION

The **SAB Project** seeks to reduce poverty among wetland-dependent communities in central Southern Africa. It achieves this by developing and testing strategies for the sustainable management of seasonal wetlands, including technical measures related to land husbandry and the maintenance of a functional landscape, and by influencing policies at the NGO, national and international levels, so that the role of wetlands in poverty reduction is better recognised.

Wetland Action is a not-for-profit NGO which provides technical support and training to field level organisations working on wetlands and livelihoods, as well as policy support for lobbying and advocacy work. The aim of Wetland Action is to support the ecologically sound and socially sensitive use of wetlands for sustainable livelihoods. Wetland Action has experience of working with organisations in several East and Southern African countries, notably Burundi, Ethiopia, Malawi, Rwanda, Zambia. WA has also worked with the Ramsar Convention Secretariat and the UN Food and Agriculture Organisation (FAO) – see FAO Water Resources Report 33 *"Scoping agriculture-wetland interactions; Towards a sustainable multiple-response strategy"*. Wetland Action has collaborating experts in several African countries, as well as in Europe.

For further details see: **www.wetlandaction.org**
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Other partners in the SAB Project are:

- **Self Help Africa**: www.selfhelpafrica.org
- **MALEZA:** Malawi Enterprise Zones Association
- **NLWCCDP**: North Luangwa Conservation & Community Development Programme