

An analysis of the impacts of human activities and management strategies on wetland processes in southern Zimbabwe

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ABSTRACT

Wetlands are one of the most productive ecosystems in the world, as they provide benefits to humans and the environment. Despite their value, wetlands are being degraded at an unprecedented rate. Whilst explanations have been sought from natural and human perspectives, the debate surrounding wetland loss continues, and wetland loss remains a problem, especially in developing countries. A number of strategies on wetland use and management have been developed and implemented at various scales in response to wetland degradation and loss, although spatio-temporal variations were noted, as were varying levels of success, shown to be influenced by differences in existing land use, institutional structures and wetland hydrogeomorphic types. Whilst several studies focusing on specific facets of wetlands have been conducted in Zimbabwe, so far none have been carried out to document the impacts of various land uses and management strategies on wetland conditions. The present study therefore assessed the spatio-temporal impacts of human activities and related management strategies on wetland processes in six wetlands located in three rural districts in the southern part of Zimbabwe so as to address this knowledge deficit.

To achieve the objectives of the study, changing land use patterns in wetlands were assessed for the period between 1985 and 2013 from aerial photographs and RapidEye images; and the benefits derived by surrounding communities determined, complemented by information obtained from household surveys with 123 respondents. Results show that there was no major change in land use as cultivation dominated throughout and increased by only 7.7% between 1985 and 2013. This result prompted the need to assess the impact of cultivation on wetland biophysical conditions (hydrology, geomorphology and vegetation) using the WET-Health framework. Results show that not all, but some cultivation methods negatively affected the present hydrological state of the wetlands. It was observed that broad ridges and broad furrows and concrete canals were largely responsible for drying. Vegetation structure and composition has been seriously modified by cultivation as evident in invasion by non-wetland species.

In order to understand how management strategies influenced use and conservation of wetlands, the study used stakeholders' perceptions to investigate the effectiveness of existing institutional arrangements in regulating wetland protection. The results show that the degree

of wetland protection depends on the number, frequency and relations of institutions operating at each site. Although government departments, traditional leaders, wetland committees and non-governmental organizations participated, generally there was no uniformity in the existing institutional structures at each wetland. Conflicts and discord were sometimes apparent between institutions due to divergent institutional mandates torn between socio-economic and environmental considerations. Traditional leaders and wetland committees were present at each site and where they were effectively involved, wetlands were better conserved as shown by their ecological conditions with little evidence of soil erosion and hydrological alterations as in the case of Chebvuterambatemwa, Dufuya, Madigane and Tugwi.

The study further investigated the gap between policy and practice, especially in light of the new legal dispensation which encourage wise use of wetlands, dating back to 2003. The results show that most of the people (61.8%) were not aware of national wetland law; hence there was a disjuncture between legal provisions and practical implementation resulting in little impact on wetland conservation. Poor implementation of national wetland law may be ascribed to a number of socio-economic factors and institutional challenges. The results of the study further showed that in better conserved wetlands, such as Chebvuterambatemwa, Dufuya and Tugwi, effective soil and water conservation measures were in place and their implementation was effectively monitored by local institutions. Food security of most households adjacent to these wetlands was stable.

Overall, the findings of this study highlighted the importance of understanding the effects of cultivation and related institutional arrangements and policy frameworks on wetland conservation. The study demonstrates the need to adopt a holistic, people-centered approach in wetland management that also considers the environment. The results further provide insights for Zimbabwe to shift towards an integrated approach, to facilitate effective and sustainable utilization of wetlands. It is in this context that this research provides baseline information that can be utilized in the formulation of wetland resources management frameworks based on an understanding of the interaction between anthropogenic, socio-economic and ecological processes.