Human impacts on macrophyte diversity, water quality and some soil properties in the Madikane and Dufuya wetlands of Lower Gweru, Zimbabwe.

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Abstract

This study investigated how the exploitation of wetlands, locally known as dambos, changes their vegetation composition, soil properties and how that in-turn affects the water quality. We therefore compared diversity and soil conditions between a protected (Madikane) and exploited (Dufuya) dambo impacted by communal agriculture and grazing in Lower Gweru, Zimbabwe. Species diversity was higher in Madikane ($H'=2.52$) than Dufuya ($H'=2.14$). Species that were present in Madikane indicated a permanent or semi-permanent wetness compared to species tolerant to arid conditions, reflecting disturbance in Dufuya. Dambo utilization also indicated a change in dominance from perennials to annuals and an increase in exotic species. There was no significant difference in the physical structure of the soil between the rather pristine and exploited sites (% clay and % silt, $p>0.05$). A significant difference was recorded in the chemical properties of the soil (pH, phosphorus, nitrate-N, ammonium-N and organic carboncontent). Water quality was good in the protected dambo than the exploited dambo as indicated by the differences in calcium ions and conductivity. The protection of wetlands is shown to be important in conserving biological diversity.