Understanding communities' perceptions, demographics and uses of wetlands in Vhembe Biosphere Reserve, South Africa

Article *in* Wetlands Ecology and Management · August 2022

DOI: 10.1007/s11273-022-09892-2

CITATIONS
0

READS
195

7 authors, including:

Mwazvita TB Dalu
University of Mpumalanga
33 PUBLICATIONS **807** CITATIONS
SEE PROFILE

Ross N Cuthbert
Queen's University Belfast
222 PUBLICATIONS **2,437** CITATIONS
SEE PROFILE

Thomas Marambanyika
Midlands State University
32 PUBLICATIONS **163** CITATIONS
SEE PROFILE

Florence Murungweni
University of Venda
13 PUBLICATIONS **139** CITATIONS
SEE PROFILE

Wetlands Ecol Manage
https://doi.org/10.1007/s11273-022-09892-2

ORIGINAL PAPER

Understanding communities' perceptions, demographics and uses of wetlands in Vhembe Biosphere Reserve, South Africa

Mwazvita T. B. Dalu · Onica Mukhuwana · Ross N. Cuthbert · Thomas Marambanyika · Ashley W. Gunter · Florence M. Murungweni · Tatenda Dalu

Received: 1 November 2021 / Accepted: 20 July 2022

Abstract Wetlands are amongst the world's most important ecosystems, providing direct and indirect benefits to local communities. However, wetlands worldwide continue to be degraded due to unsustainable use and improper resource management. In this paper, we assess the perceptions, importance, management and utilisation of wetlands among local community members using a household questionnaire and field observations within the seven Thulamela municipality wetlands, Vhembe Biosphere Reserve in South Africa. Seven wetlands were chosen for the study, with 140 household respondents randomly selected for a questionnaire survey. The study indicated that wetlands were beneficial in supporting local communities through resource provisioning. The unemployment rate and household respondents' income were the main contributors to increased wetland dependency and utilisation. We found that urban and rural developments, unregulated use and extensive agricultural practices (i.e., cultivation, livestock grazing) have resulted in wetland degradation. We observed that the local communities around the wetlands were interested in the benefits they receive from wetlands when compared to their conservation. Furthermore, the study observed poor wetland co-management or collaboration among the local stakeholders. This has resulted in a lack of openly known, active platforms to discuss wetlands management issues. These results highlight that centralized, top–down approaches to wetland use are insufficient for maintaining and managing wetland ecosystems,

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11273-022-09892-2.

M. T. B. Dalu · T. Dalu
School of Biology and Environmental Sciences, University of Mpumalanga, Nelspruit 1200, South Africa

O. Mukhuwana · F. M. Murungweni
Department of Geography and Environmental Sciences, University of Venda, Thohoyandou 0950, South Africa

R. N. Cuthbert
GEOMAR Helmholtz Centre for Ocean Research Kiel, 24105 Kiel, Germany

R. N. Cuthbert · T. Dalu
South African Institute for Aquatic Biodiversity, Makhanda 6140, South Africa

T. Marambanyika
Department of Geography, Environmental Sustainability and Resilience Building, Midlands State University, Gweru, Zimbabwe

A. W. Gunter
Department of Geography, University of South Africa, Pretoria 0001, South Africa

T. Dalu (✉)
Wissenschaftskolleg zu Berlin—Institute for Advanced Study, 14193 Berlin, Germany
e-mail: dalutatenda@yahoo.co.uk

Published online: 09 August 2022

posing a challenge to sustainable wetland management. Therefore, there is a need to develop a shared understanding through bottom-up approaches to wetland management nested within national regulatory frameworks, ideally combined with awareness building and knowledge sharing on ecological benefits and management of wetlands.

Keywords Wetlands · Ecosystem services · Local communities · Stakeholders · Wetland management

Introduction

Wetlands occupy over 1280 million hectares, approximately 6.2–7.6% of the Earth's land surface (Melendez-Pastor et al. 2010). Therefore, wetlands are among the world's most essential and productive ecosystems, internationally recognised for their various ecosystem services (Hu et al. 2017; Dalu and Wasserman 2022). However, these socio-ecological systems are highly complex due to varying hydrology (Ollis et al. 2013; Verones et al. 2013). Depending on the characteristics of each wetland type, they provide an array of critical ecological functions and services, ranging from flood control to groundwater recharge and discharge, water quality maintenance, habitat and nursery for diverse plant and animal species, soil components, carbon sequestration, and other life support functions (Barbier et al. 1997; Davies and Day 1998; Birol et al. 2006; Whiteoak and Binney 2012; Clarkson et at. 2013). Despite their importance, approximately 50% of the world's wetlands have been lost in the last ~ 100 years (Finlayson 2012; Davidson 2014; Dalu et al. 2017).

With many countries in the world facing increasingly severe water scarcity, and increased focus needs to be placed on wetlands as primary water sources through adequately developed and managed intervention strategies since most of these systems are the sources of our freshwater supply (Mancosu et al. 2015; Cosgrove and Loucks 2015; Wondie 2018). However, the intensity of wetland degradation problems varies among countries, depending on various factors such as settlement and infrastructural development, level of economic growth, legislation, population dynamics and geography (Gourbesville 2008; Hushulong 2012; Guppy and Anderson 2017). Fundamentally, human population increase inevitably exacerbates wetland degradation through several human activities (Harte 2007; Jogo 2010; Kometa et al. 2018). In developing countries, such as South Africa, water crises are rapidly increasing due to climate change and poor management of wetlands, which are the source of most freshwater systems (Herbst 2015; Rodda et al. 2016; Belle et al. 2018).

Wetlands are high-value ecosystems that make up only a tiny fraction (2.4%) of South Africa's surface area but provide many benefits to society (Jogo and Hassan 2010; Macfarlane et al. 2016; Skowno et al. 2019). They rank among the most fragile and threatened ecosystems, continuously degraded and improperly managed and utilised (Collins 2005; Macfarlane, 2016; Skowno et al. 2019). Most of South Africa's remaining wetlands have been identified as highly threatened (i.e., 48% critically endangered, 12% endangered, 5% vulnerable), with only 11% of wetland ecosystem types being well-protected and approximately 71% unprotected (Macfarlane et al. 2016). The remaining wetland systems suffer from degradation through anthropogenic activities such as increased residential and commercial developments, invasive alien species introductions, unsustainable exploitation, artificial drainage and damming, and pollution (Collins 2005; Thamaga and Dube 2018). Other factors contributing to wetland degradation and management include poverty and economic inequality, behaviour or perception, cultural and social conflicts (Skourtos et al. 2003; Phethi and Gumbo 2019). Poor wetland management potentially undermines their capacity to provide essential ecosystem services in the future, thus impacting local communities' livelihoods and wellbeing (Xulu 2014; Herbst 2015; Macfarlane et al. 2016).

Given that continued wetland degradation significantly impact biodiversity, ecological functions, and ecosystem services provision, it is crucial to prioritise South Africa's remaining wetlands, including those affected by current anthropogenic pressures, and develop strategies to avoid further loss, conversion and degradation (Herbst 2015; Skowno et al. 2019). Whereas wetlands are increasingly being recognised as necessary natural resources (Collins 2005; Kingsford et al. 2016), different wetland stakeholders struggle to find ways to work collaboratively to maintain and manage wetlands while also providing for the needs of multiple human interests (Darradi et al. 2006; Maze et al. 2016). Various studies (e.g.,