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Mangrove cover and cover change analysis in the transboundary area of Kenya and Tanzania during 1986–2016

Fredrick Mungai[a], James Kairo[c], John Mironga[a], Bernard Kirui[b], Mwita Mangora[d] and Nico Koedam[e]

[a]Department of Geography, Egerton University, Njoro, Kenya; [b]Department of Natural Resource, Egerton University, Njoro, Kenya; [c]Kenya Marine & Fisheries Research Institute, Mombasa, Kenya; [d]Institute of Marine Sciences, University of Dar es Salaam, Dar es Salaam, Tanzania; [e]Laboratory of Plant Biology and Nature Management, Ecology and Biodiversity, Vrije Universiteit Brussel – VUB, Brussels, Belgium

ABSTRACT

Mangrove forests are among the most threatened ecosystems on earth. Some of these forests traverse national boundaries complicating their management due to differences in governance structures between countries. To improve the management of transboundary species regular monitoring is essential. Remotely sensed data were used to estimate forest cover and analyze conditions of mangroves in the proposed transboundary conservation area (TBCA) between Kenya and Tanzania. Image analysis was performed using unsupervised and supervised classification methods. The transboundary mangroves cover an estimated 11,906 ha; 55% being in Kenya, 45% in Tanzania. *Ceriops tagal, Avicennia marina*, and *Rhizophora mucronata* species co-dominate the mangroves of the transboundary area. The hotspot for loss and degradation of mangrove in the TBCA is Vanga in Kenya with a loss of 27 ha/yr. Harvesting of mangrove wood products have contributed to the loss of mangroves in the transboundary area. TBCA formation could play a critical role in ensuring sustainable mangrove resources utilization.

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Introduction

Mangroves provide benefits to humans through provision of a wide range of goods and services (Obura et al., 2017; UNEP, 2014). They filter land run-off, support coastal fisheries through provision of nurseries breeding sites to marine biota and through transportation of organic matter to the marine environment and they can protect the shoreline from erosion. However, around the world, losses of mangroves in the past decades was estimated at a rate of 1–2% per annum; which is significantly higher than the loss of any natural habitat (FAO, 2007; Giri et al., 2011; Spalding, Kainuma, & Collins, 2010); although other studies have shown a reduced rate of <1%/annum (Hamilton & Casey, 2016; Thomas et al., 2017). Losses of mangroves are disproportionately higher in South East Asia and

CONTACT Fredrick Mungai mburufredrickm@gmail.com Department of Geography, Egerton University, Box 536, Njoro, Kenya