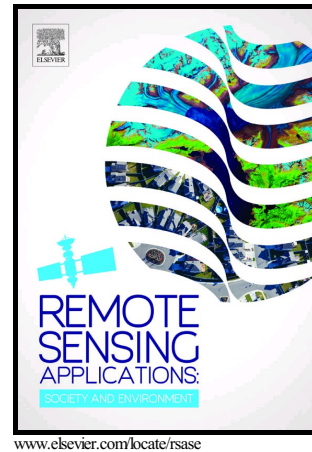


Author's Accepted Manuscript

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PII: S2352-9385(18)30147-2
DOI: <https://doi.org/10.1016/j.rsase.2018.09.002>
Reference: RSASE165

To appear in: *Remote Sensing Applications: Society and Environment*

Received date: 27 April 2018
Revised date: 6 September 2018
Accepted date: 13 September 2018

Cite this article as: Mesfin Sahle and Kumelachew Yeshitela, Dynamics of land use land cover and their drivers study for management of ecosystems in the socio-ecological landscape of Gurage Mountains, Ethiopia, *Remote Sensing Applications: Society and Environment*, <https://doi.org/10.1016/j.rsase.2018.09.002>

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Dynamics of land use land cover and their drivers study for management of ecosystems in the socio-ecological landscape of Gurage Mountains, Ethiopia

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Abstract

This study analyzed the land use and land cover (LULC) dynamics with their main driving factors for management of ecosystems in the socio-ecological landscape of Wabe River catchment in Gurage Mountains, Ethiopia. The study used 1986, 2000, and 2017 Landsat satellite images to detect trends, and group discussions with local experts to identify and describe the drivers of changes. Digital satellite image processing and accuracy assessment were conducted using ERDAS Imagine software. The result shows that there has been a dynamics of LULC between 1986 and 2017. The rate of change was higher from 1986–2000 than from 2000–2017. While forest and Afro-alpine vegetation decreased at the highest rate, shrub land and cereal crop land increased in reverse. Large parts of grazing land were converted to cereal crop land. The change of LULC was higher in cool agro-ecology areas than warm and humid agro-ecology areas. These changes were produced as the result of direct and indirect drivers. This study through satellite images based land use change analysis acquired a solid information on the status of ecosystem in the catchment which is required for many aspects of land use planning and policy development. Thus, efforts are needed to manage the Wabe River catchment through well integrated landscape planning based on the information derived in this study to address the effects of drivers and to reduce the deterioration of natural resources.

Keywords:

Image classification, Rate of change, Agro-ecology, Causes, Land use planning

1. Introduction

Land use and land cover (LULC) change is the alteration of Earth's terrestrial surface mainly by anthropogenic activities (Turner and Meyer, 1994). Humans have modified the earth for resources which contribute to their livelihoods and provide essential materials for thousands of years. However, the extent, intensity, and rate of

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