



UNITED NATIONS
UNIVERSITY

UNU-LRT

Land Restoration Training Programme
Keldnaholt, 112 Reykjavik, Iceland

Final project 2017

THE IMPACT OF INTEGRATED WATERSHED MANAGEMENT ON LAND USE AND LAND COVER CHANGE IN THE BOHELE AND MEDHANITE WATERSHEDS IN NORTHERN ETHIOPIA

Birhane Etay Reda

Tigray Regional State
Ethiopia

birhanee23@gmail.com

Supervisors:

Jón Guðmundsson

Agricultural University of Iceland

jong@lbhi.is

Ingibjörg Jónsdóttir

University of Iceland

ij@hi.is

ABSTRACT

Soil erosion and land degradation affect the land. This problem is severe in Ethiopia due to its steep slope topographic features. Integrated watershed management and land restoration are very important for the sustainable agricultural development of the country. This research was aimed to estimate changes in land use and land cover change in the Bohele and Medhanite watersheds in northern Ethiopia. This study was carried out by using LANDSAT images from 1984, 2016, and 2017. In Bohele for 1984 the Normalized Difference Vegetation Index value < 0.20 was 46.79% and the Normalization Difference Vegetation Index value > 0.20 was 53.47% of the total area, but in 2017 value < 0.20 is 1.48%, and > 0.20 is 98.52% of the total area or an increase of 45.05%. The mean and standard deviation of the mean of 1984 were 0.2063 & 0.0275 and for 2017 are 0.3289 and 0.01800, respectively, while the in Medhanite Normalization Difference Vegetation Index value > 0.20 is 10.48% of the total area of the watershed. In Medhanite the mean and standard deviation of the mean were 0.1229 and 0.01849 for 1984 but 0.1821 and 0.0139 for 2017, respectively. The gap between the mean and standard deviation of the mean at Bohele was very high in 2017, whereas the gap at Medhanite was very low. The high gap shows a large vegetation cover change and vice versa. This change in the Normalization Difference Vegetation Index has led to changes in land use in both watersheds. The land use change at Bohele was that 246.09 hectares of bare land were converted to forest land, 25.09 hectares to cultivated land, and 8.74 ha from grassland to a dam and 10.78 hectares to cultivated land. In the Medhanite watershed the forest land decreased 12.47 hectares to grass, 388.18 hectares to cultivated land, and 247.04 hectares to bare land.