

Analysis of Climate Influences on Distributions and Trends of Net Primary Production focusing on Cropland Areas in Ethiopia

Josef Kaiser, Bachelor Thesis

Abstract

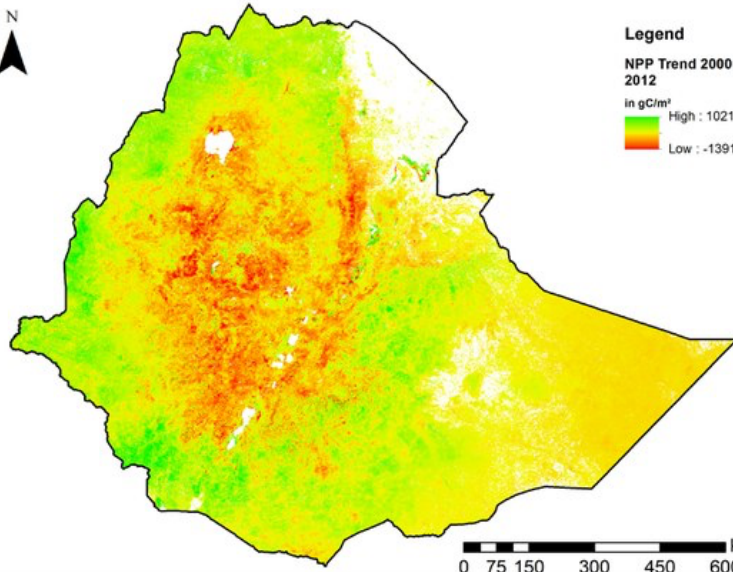
Net primary production (NPP) shows even on a local scale differing trends mainly due to climate and human influences. Human activities like deforestation, urbanization or degradation on agricultural areas are strongly connected to decreasing NPP values. Especially on cropland areas it is indispensable to stabilize or even increase the production while taking sustainable aspects into account. This challenge particularly concerns countries in Sub-Saharan Africa. The study aims to investigate the relationships between NPP and climate factors and, as the first analysis of this type it sets the focus on Ethiopia as investigation area. With a novel approach the influence of different climate components is assessed using partial correlation analyses to explore the differences of cropland and non-cropland areas. Generally the results show diverse NPP trends in Ethiopia, which can often be explained by climate variabilities. It can clearly be seen that NPP on cropland areas is less affected by climate fluctuations than on non-cropland areas. Furthermore it becomes apparent that negative NPP trends can be less explained by climate influences. Thus it is likely that many NPP decreases are connected to human influences. Hence this study gives interesting insights on the influencing factors on NPP, which can provide a basis for further analyses for the purpose of a better understanding of the productivity of different agricultural use scenarios and potential NPP intensifications under sustainable conditions.

NPP Trends in Ethiopia within the Period 2000 - 2012
Calculated by Ordinary Least Square Regression
NPP versus Time



Legend

NPP Trend 2000 -
2012
in gC/m^2
High : 1021,42
Low : -1391,74



0 75 150 300 450 600 Kilometers