Geophysical Research Abstracts
Vol. 19, EGU2017-3846, 2017
EGU General Assembly 2017

Assessment of Land Degradation and Greening in Ken River Basin of Central India

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Natural systems have significant impact of land degradation on biodiversity loss, food and water insecurity. To achieve the sustainable development goals, advances in remote sensing and geographical information systems (GIS) are progressively utilized to combat climate change, land degradation and poverty issues of developing country. The Ken River Basin (KRB) has dominating land cover pattern of agriculture and forest area. Nowadays, this pattern is affected due to climate change and anthropogenic activity like deforestation. In this study, land degradation and greening status of KRB of Central India during the years 2001 to 2013 have been assessed using MODIS land cover (MCD12Q1) data sets. International Geosphere Biosphere Programme (IGBP) land cover data has been extracted from the MCD12Q1 data product. Multiple rasters of MODIS landcover were analyzed and compared for assigning unique combination of land cover dynamics employing ArcGIS software. Result reveals that 14.38% natural vegetation was degraded, and crop land and woody savannas were greened by 9.68% to 6.94% respectively. Natural vegetation degradation have been observed in the upper KRB area, and resulted to increase in crop land (3418.87 km2) and woody savannas (1242.23 km2) area. Due to transition of 1043.6 km2 area of deciduous broadleaf forest to woody savannas greening was also observed. Moreover, both crop land and woody savannas showed inter-transitions of 669.31 km2 into crop land to woody savannas, and 874.09 km2 into woody savannas to crop land. The present analysis reveals that natural vegetation has more land conversions into woody savannas and crop land in the KRB area. Further, Spatial change analysis shows that land degradation and greening has occurred mostly in the upper part of the KRB. The study reveals that the land transition information can be useful for proper planning and management of natural resources.