Modelling of Land Use Land Cover Dynamics for Water Yield Using Remotes Sensing within a watershed

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Abstract: Deforestation, agricultural expansion and infrastructural development as a result of human induced land use land cover (LULC) are declining watershed conditions. This phenomenon, which is occurring at an amazing rate, and its significant environmental influence have become an essential area of research for scientist. Remote sensing is applied to study land use land cover dynamic and its influence on water yield. Hence, a wide range of methods and models have been developed to identify and forecast these alterations among which are soil water assessment tools (SWAT) due to its wide range of coverage in evaluation of water properties in the past, current and future. The land use changes in the period of 2000-2005; 2006-2010 and 2000-2010 were obtained from post-classification comparison analysis of land use acquired by classification of Landsat-7 Thematic Mapper plus (ETM+). Consequently, the result demonstrates an increase in water yield and a decrease in evapotranspiration (ET), which indicated linked to factors of deforestation and an increase in agricultural activities. Likewise, the water yield has increased by 7.96% from 2000 to 2010, while ET decreases by 3.10% in the same period. The variations in the forest are found directly proportional to water yield ($R^2 > 0.85$, $p < 0.001$). It is then concluded that land use land cover dynamics using Remotes sensing is the best for monitoring the corresponding water yield in this study and its influence on water resources. This provides a significant input for decision makers, planners and sustainable for management of surface water resources.

Keywords: Evapotranspiration, Land use change, Water yield, SWAT, Remote sensing