Streamflow sensitivity to land cover changes: Akaki River, Ethiopia

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Abstract

The impact of land cover changes on streamflow of the Akaki catchment will be assessed using Soil and Water Assessment Tool (SWAT) model. The study will analyze the historical land cover changes (1993 to 2016) that have taken place in the catchment and its effect on the streamflow of the study area. Arc GIS will be used to analysis the satellite images obtained from the United States Geological Survey (USGS). To investigate the impact of land cover change on streamflow the model set up will be done using readily available spatial and temporal data, and calibrated against measured discharge. Two third of the data will be used for model calibration (1993–2000) and the remaining one-third for model validation (2001–2004). Model performance will be evaluated by using Nash and Sutcliff efficiency (NS) and coefficient of determination (R2). The calibrated model will be used to assess two land cover change (2002 and 2016) scenarios and its likely impacts of land use changes on the runoff will be quantified. The evaluation of the model response to these changes on streamflow will be presented properly. The study will contribute a lot to understand land use and land cover change on streamflow. This enhances the ability of stakeholder to implement sound policies to minimize undesirable future impacts and management alternatives which have a significant role in future flood control of the study area.

Keywords : Streamflow, SWAT, Land Use Change, Model Performance

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