Evaluation of Forest Water Storage by changing Land Cover in Korea Peninsula

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Water security depends on forests. Forest return less water to soil compared with grasslands or cultivation land because of their higher contribution to atmospheric moisture content via evapotranspiration. Water infiltration and retention are encouraged in forest soil by root systems. They are vital for reducing soil erosion and reducing drought by capturing fog water, reducing surface water run-off and promoting groundwater recharge. Deforestation and Afforestation in Korea Peninsula may cause change of water yield on precipitation storage and erosion control. This study is focus on how much water is contented in the changing land cover, especially forests. SWAT (Soil and Water Assessment Tool) model needs some data for simulation of water yield for example DEM, climatic data, land cover, soil data, etc. In this study, evaluation of water yield was performed at two time, 2005 and 2018 using SWAT model. Land cover was classified by using GEE (Google Earth Engine) which is useful tool for classification about enormous data. Through GEE, we got the two land cover maps, 2005 and 2018, these data were used for input data in SWAT model. Soil data is used by FAO Soil. To calibrate result data, we controlled some parameters like soil depth, porous volume which have stronger correlation between forests and soil properties. We can find that forest can store more water than other classes such as city, agriculture, and so on. In this study, we quantitatively estimated the water content by changing land cover. This study present functional positive effects of forests to store water. This study can be used in preparing various forest strategy in South Korea. Above all, this result maybe useful background data for supporting North Korea in afforestation.