Impact of Reforestation on Stabilization of Water Level of River in Korea

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ABSTRACT

The main objective of this study is to investigate whether and to what extent reforestation contributes on stabilization of water level in river, one of the expected benefits from forest, using both time series and panel data obtained from three rivers in Korea. The time series analysis using daily data collected from each river for the period from 1985 to 2005 show that the impacts of lagged water level and rainfall decrease as the volume of growing stock in adjacent forest increases. However, it is not certain whether that change is contribution of reforestation or contribution of unknown variables with trend. The estimations using panel data of six water level observatories and five rainfall observatories in the three rivers for the same period confirms that the changes in impacts of lagged water level and rainfall cannot be explained by a trend but my reforestation. According to simulations based on the estimation results, when it rains one hundred millimeter per day at time zero, the water level rises by 16.7% on that day, if the volume of growing stock is 1 million m^3. In contrast, the water level rises by 10.7%, if the volume of growing stock is 5 million m^3. Then, the effects of rainfall gradually vanish.