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Estimating the Water Conservation Value of Forest Ecosystems

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Abstract

Forests are one of the most valuable terrestrial ecosystems that provide variable goods and services. There is no market value for most of forest ecosystem services. One of the most important functions of the forest ecosystems is regulation of surface runoff water in watershed by holding the water and its gradual distribution to the rivers. To calculate the value of this function, it is necessary to estimate the forest contribution in surface water runoff controls, and then it is possible to calculate the value with using economic valuation methods. In this study, height and volume of surface runoff in the current status of the study area (natural forest) was calculated with using Justin experimental methods. Two scenarios have been defined including converting the forest area into degraded forest, and into an eroded pasture. The amount of water that has been hold in each scenario was calculated separately. Research results indicate that converting the study area into degraded forest will make the amount of surface water more than twice, and changed into eroded pasture will make the amount of surface water more than six times; this means reduction in amount of water stored in underground water table. The value of this forest ecosystem function has been estimated by using replacement costs method. The results shows that each hectare of the study area has a value as 102 Thousand Rials in the protection of water resources, compared with a degraded forest, and 464 thousand Rials compared with an eroded pasture. The map of this ecosystem service has been made by using geographic information system.

Keywords: Caspian forest, economic valuation, forest ecosystem services, replacement cost method, water resource conservation