



Ecological economic evaluation of the degraded natural vegetation restoration after water transfer to the lower Tarim River, Xinjiang region of northwestern China

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The emergency ecological water transfer has been implemented for 12 years since 2000 in the lower Tarim River with the goal of restoring the impaired ecosystem and protected habitat environment. It is necessary to evaluate the ecological economic benefits of the vegetative system in order to measure the success of the rehabilitated ecosystem. Based on a hypothesis that the growth of the natural vegetation has a hysteresis with increased groundwater level, this paper suggests that the ecological economic value of the natural vegetation response to groundwater level elevation theoretically includes two parts: the direct value resulting from the increased aboveground biomass of the natural vegetation and the potential value resulting from the natural vegetative restoration in the future. The ecological economic analysis method is applied to calculate assess the ecological economic benefits of the natural vegetative restoration in Kaogan area. The total investment cost of increased groundwater level after seven years is 867 US Dollars in the 100-metre-wide, 2000-metre-long sample belt. The direct value is 1491 US Dollars and the direct input-output ratio is 1:1.7. While the potential value is 4989 US Dollars and the total input-output ratio is 1:7.5. The results indicate that the ecological economic benefits of natural vegetative response are significant after seven years of groundwater level elevation in the lower Tarim River. It also provides a theoretical reference for quantifying the benefits of the degraded ecosystem restoration.

Keywords: The lower reaches of Tarim River; ecological water transfer project; ecological economic value; the potential value