Assessment of Ecosystem services under changing climate in the Bagmati Basin of Nepal

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Abstract

The 2006 Millennium Ecosystem Assessment (MA) defines ecosystem services (ES) as "the benefits people obtain from ecosystems". Identifying where ES originates, whom it benefits and how it is changing over a period of time is critical in rapidly developing country like Nepal, where the risk of ES loss is high. In the context of various ecosystem services provided by watershed, this study, particularly deals with water yield, Soil loss and Carbon sequestration computation and evaluation in Bagmati Basin of Nepal. As Bagmati Basin incorporates capital city Kathmandu of nepal, land use change is significant over decades and mapping of ES is crucial for sustainable development of Basin in future. In this regard, the objectives of this study are 1) To compute the total and sub-watershed scale water yield of the basin, 2) Computation of soil loss and sediment retention in the basin, and 3) Computation of carbon sequestration in the basin. Integrated Valuation of Environmental Services and Tradeoffs (InVEST), a popular model for ecosystem service assessment based on Budyko hydrological method is used to compute Ecosystem services. The scenario of ES in two periods of time can be referenced for various approaches of prioritization and incorporation of their value into local and regional decision making for management of basin.

Key words: Ecosystem service valuation, InVEST, water yield, soil loss, carbon sequestration, climate change.

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