

Evaluation of ecosystem services of Kahe forest reserve, Northern Tanzania

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ABSTRACT:

Changes of land use/cover caused by human pressure on protected landscape can significantly alter the provision of ecosystem services. Estimating the multiple services, particularly those obtained from forestry systems, is seldom attempted. A combined approach of geospatial technology, cross-sectional field investigations, and economic evaluation of natural capital was used to estimate changes in the Ecosystem Services Valuation (ESV) of Kahe Forest Reserve at Northern Tanzania from 1998 to 2018. Benefit transfer method was employed using adapted local and global ecosystem Value Coefficients (VCs) of 2007 US\$/ha from TEEB foundation. The study landscape with 749 ha was categorized into five land use classes, which yielded an annual total Ecosystem Services Valuation (ESV) of \$ 837, 038.7 or \$ 1, 565, 967 in 1998 and \$ 713 176.5 or \$ 1,630, 883 in 2018 using local and global VCs respectively. Local estimates showed decrement of ESV of 14.8% compared to global estimate of 4.1% increment ESV in a decade. However we observed losses of forest class ESV by 236.1% per annum in a decade due to deforestation. Appreciating the importance of forest in climate change mitigation and provision of ecosystem services, the study strongly recommend that their economic value should be included in management regime and policy implementation for the sustainability of the ecosystem.

Keywords:

Ecosystem services; Ecosystem service valuation; Kahe forest reserve; Land use and conservation policy.