Addressing Sustainability of Fresh Water Lake: The Ecosystem Valuation of Vellayani Lake in South India

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Abstract

Fresh water lakes are sources of non saline water that can provide a manifold of direct and indirect ecosystem services to people. In a developing country like India, where availability of good quality water is crucial in determining the health security of people the presence of a freshwater lake benefits many stakeholders. A failure of information and lack of understanding on the economic value associated with any natural resource is the major reason for the degradation negative effects on sustainability. The Total Economic Value (TEV) encompasses the measure of the economic benefits of any environmental asset. The conflicting nature of interests by various stake holders is the major trap in addressing the sustainability issues. Vellayani lake, is the only fresh water lake in the Thiruvanathapuram district in Kerala state of India and is subjected to degradation due to urban pressures. So it is attempted to evaluate the TEV and prioritise the stakeholders based on the dependence on lake. The TEV is composed of provisioning service, cultural service, regulating and supporting functions. The provisioning ecosystem services are measured using market price and opportunity cost method were fishing, lotus collection, duck rearing, drinking water, irrigation water and bathing, which together contributed Rs.392.58 crore per year. The cultural services estimated using public pricing method included the services used by Centralised Sports Hostel for Canoeing and Kayaking and the annual boat race. The recreational and spiritual services value estimated using Travel Cost Method and the aesthetic value estimated using Hedonic Property Pricing accounted to Rs. 0.56 crore per year and Rs. 275.92 crore per year respectively. The Contingent Valuation Method revealed the value of regulating and supporting function as Rs 2.91 crore per year. Thus TEV of Vellayani lake estimated by the summation of economic value of various services was Rs 672.28 crore per year The value of ecosystem services expressed in the present study is an estimate of the benefits to the society and guides in prioritising the stakeholders. So these values can serve as communication tools for balanced decision making with respect to resource use and thus overcoming the traps in stakeholder management.

Keywords: Contingent valuation method, fresh water lake, hedonic property pricing method, sustainability, total economic value, travel cost method, Vellayani lake

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