

Assessing the Role of Wetland Ecosystem Services and their Support for Sustainable Livelihood of Local Community: A Case Study in Kirala Kele Wetland, Matara

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Abstract

Wetlands are vital ecosystems offering valuable goods and services to the local community. However, there is a gap in understanding the economic contributions of the Kirala Kele Wetland (KKW), located in Matara District, Sri Lanka, to the nearby community. This understanding is important because demonstrating this economic value is necessary to drive policies that balance ecological conservation with sustainable livelihoods. Accordingly, this study assesses the direct economic role of KKW and analyzes the socioeconomic determinants affecting community dependence on wetland resources for their sustainable livelihoods. Additionally, this study aims to assess the perception of the local community on KKW's intangible ecosystem services and environmental concerns. A mixed-method research design was employed, consisting of survey of 184 households and 6 Key Informant Interviews (KII) in three Grama Niladhari divisions adjacent to KKW. This study used the market-price valuation method to estimate annual wetland-derived household economic value (WDHEV) and used statistical analyses (Mann-Whitney U tests, Spearman correlation, and multiple linear regression) to identify socioeconomic determinants of wetland resource use. Additionally, qualitative thematic analysis assessed community perceptions towards KKW. The key results show that 74.5% of households surveyed gain direct economic benefits from KKW. Among economically dependent households, the mean annual WDHEV was LKR 413,070, consisting of an average of 48.9% of their total annual household income. Further statistical analysis showed that KKW serves as a vital "safety net" for low-income households sustaining their livelihoods. The Regression analysis ($R^2 \approx 0.25$) showed that distance to the wetland and the presence of agricultural land significantly affected the WDHEV, whereas variables age, household size, education level, and involvement in wetland conservation activities had no significant effect. The qualitative thematic analysis identified the cultural, regulating, and supporting ecosystem services of KKW. At the same time, pollution, invasive species, illegal waste disposal, and governance failures were identified as leading to significant environmental degradation on KKW, which threatens the sustainability of local livelihoods. This study contributes an analysis about both the tangible and intangible benefits to local communities which urban wetlands provide, thus contributes an understanding of the importance in conserving them. The policy and practice implications are that evidence-based policies promoting community-based co-management are crucial to balance ecological preservation with community economic well-being. Further, management strategies should prioritize enforcing conservation regulations, control pollution, and promoting sustainable alternative livelihoods to reduce pressure on wetland resources.

Keywords: Wetland ecosystem services, sustainable livelihoods, Kirala Kele wetland, economic valuation, wetland dependency