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Watershed Management Practices and Their Long-Term Impacts in the Uva Basin, Sri Lanka: A Case Study of the Upper Watershed Management Project

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Abstract

The Uva basin of Sri Lanka, with its unique geomorphology and dominance of Uma Oya and Badulu Oya sub-catchments is identified as one of the most eroded sub-basins in the country. The area imposes considerable sedimentation to the Rantambe Reservoir, which has lost nearly 56% of its original storage capacity. To address these issues, the Upper Watershed Management Project (UWMP) was implemented from 1998-2006 under the Ministry of Environment with financial support from the Asian Development Bank. This study aimed to evaluate the long-term effectiveness of watershed management interventions, community adoption, and their effect on sustainable land productivity in Uma Oya sub-basin's Hibiliagolla Grama Niladari Division. Participatory observation, direct measurements, farmer interviews, and interaction with a social mobilizer were undertaken at Mahagandowa village, which was the project focus area. A total of 25 farmers were interviewed. A combination of qualitative assessment by participatory observation and quantitative measurement of land and terraces were made to determine the effectiveness of conservation. Findings revealed that nearly 60% of the soil and water conservation measures introduced under UWMP are still practiced even after 17 years since project completion. Mechanical, biological, and cultural measures such as terrace farming, stone bunding, block spill drains, grass ridges with *Cymbopogon citratus* (lemon grass), and wind-controlling tree strips have been effectively sustained by farmers. Terraces widths ranged between 7-13 feet, depending on slope and soil condition, indicating effective design guideline adaptation. Farmers reported increases in vegetables such as carrots, potatoes, and onions following soil stabilization. Besides, regular maintenance of above mountain forest cover and riparian zones increased infiltration and reduced the runoff velocity. The interviews revealed that the reward and participation-based approaches and social mobilizers increased community ownership and long-term sustainability of the project impact. Inadequate post-project impact evaluation and narrow replication of the model in other erosion sites were documented as key weaknesses. Finally, the study concludes that the Upper Watershed Management Project has resulted in concrete environmental and socio-economic benefits and reveals the advantages of participatory watershed management and community-based conservation in sustainable land and water management.

Keywords: *Uma oya*, *Uva basin*, *Soil conservation*, *Sustainable watershed management*