PLANNING FOR OPTIMUM SOIL EROSION MANAGEMENT BASED ON REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM: CASE OF WATERSHED IN NEPAL

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Abstract: Soil erosion is considered a serious threat to long-term viability of agriculture in many parts of the world. Land resources undergo degradation due to landslide, accelerated soil erosion and declining fertility. The objective of this study is to estimate an economic impact of water induced soil erosion in Phewa watershed, Nepal and to identify optimum soil erosion management plan. Environmental impacts were examined using a combination of Revised Universal Soil Loss Equation (RUSLE), remote sensing and Geographic Information System (GIS) while an economic model and mathematical programming were used to assess the economic value of soil erosion. The analyses were showed that the total income of the watershed citizen was reduced with the effects of soil erosion in the comparison with baseline scenario (without erosion) and alternative scenario. Scenario result of soil erosion showed that erosion by water loss had a negative impact in the agriculture productivity. The first scenario showed that total income reduced about 20% and total area of rain fed crop was decreased. The second scenario showed that total income of watershed was reduced with 30% because of lack of water in winter season. The result of this study can help decision makers to plan optimum soil erosion management and conservation measures to soil and water resources. Mapping of soil erosion risk is also useful to identify the vulnerable areas. Decision maker can use economic values of soil erosion to prioritize areas of soil conservation.

Keywords: RUSLE, Soil erosion, Economic values, GIS