Soil erosion estimation based on gis and remote sensing for supporting integrated water resources conservation management

Gusta Gunawan, author

Abstrak

Soil erosion is a crucial environmental problem in the Manjunto watershed, Bengkulu Province, Indonesia. It has economic implications and environmental consequences. Assessment of potential soil erosion rate is useful in designing soil conservation strategies within the framework of integrated watershed management. Information obtained from Remote Sensing (RS) and Geographic Information System (GIS) framework supports decision makers in preparing more accurate spatial maps in less time and cost. The aim of this research is to assess the average annual rate of potential soil erosion in Manjunto watershed for each soil mapping unit using remote sensing data, namely Normalized Difference Vegetation Index (NDVI) and Slope. The NDVI value obtained from satellite imagery processing while slope value obtained from Digital Elevation Model-Shuttle Radar Topographic Mission (DEM-SRTM) processing. The results showed that the eroded catchment area increased significantly. The average annual rate of potential soil erosion in Manjunto watershed in the year 2000 amounted to 3.00 tons ha- 1 year-1, while in the year 2009 there was a significant increase to 27.03 ton ha-1year-1. The levels of erosion hazard in soil mapping unit numbers 41, 42 and 47 are classified in the very heavy category. Soil mapping unit numbers 41, 42 and 47 should be a first priority in soil and water conservation activities.