عنوان مقاله:

Estimation of peak current as a basis for sustainable watershed conservation using the number-curve land conservation

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خلاصه مقاله:

BACKGROUND AND OBJECTIVES: Peak flow in watershed is important in designing and controlling soil erosion, as well as assessing the potential water yield. It also serves as a basis for assessing and managing the risk of environmental damage. However, there is no accurate information on peak flow to ensure sustainable management and conservation of Wuno Sub-Watershed in Palu Watershed which serves as a buffer for the capital of Central Sulawesi Province. Therefore, this study aimed to assess and determine the potential runoff and peak flows in watershed using soil conservation service-curve number.METHODS: Soil conservation service-curve number method was calculated to analyze rainfall from runoff as a function of cumulative rainfall, land use, soil type, and humidity. This method was developed by the United States Soil Conservation Service in ۱۹۷۲ and applied in this study with due consideration for several variables, including (a) land use classification and intensity for settlements, rice fields, plantations, rivers, etc., (b) basic physical conditions of the area such as rainfall and hydrology, as well as (c) classes of soil hydrology significantly influencing carbon-nitrogen value.FINDINGS: The result showed that carbǒn-nitrogen values for all types of land use or cover were in normal conditions from ۵ to ۲۵ years. Moreover, carbǒn-nitrogen range was observed to have significantly large quantitative consequences on direct runoff. The trend showed the need for precision and effectiveness in planning watershed management and conservation. Soil conservation service also had a positive influence on land use, specifically runoff, as observed in carbǒn-nitrogen values for return periods of ۲, ۵, ۲۵, and ۱۰۰ years. However, several other factors were identified to influence land use such as land cover and soil texture.CONCLUSION: Soil Conservation Service presented an analysis of how land use affected runoff, specifically with a focus on carbon-nitrogen values. Land use was not only affected by carbon-nitrogen values but other factors such as land cover and geomorphometric properties. The trend showed the need for a more comprehensive exploration of soil conservation service-curve number method in accurately predicting runoff patterns in sub-watershed areas to ensure effective and sustainable management and conservation practices.

کلمات کلیدی:
Peak flow, Rainfall, Soil conservation service - carbó n-nitrogen (SCS-CN), Surface Runoff, Watershed conservation