ABSTRAK

PREDIKSI LIMPASAN PERMUKAAN PADA CURAH HUJAN NORMAL DAN CURAH HUJAN FENOMENA *EL-NINO* TAHUN 2023 DENGAN MENGGUNAKAN METODE *SOIL CONSERVATION SERVICE* (SCS) DI DAS WAY LIMA, PESAWARAN

Oleh

Gihon Tua Pardede

Fenomena *El-Nino* menyebabkan anomali iklim yang mengubah pola dan distribusi curah hujan sehingga mempengaruhi respon hidrologi daerah aliran sungai. Penelitian ini bertujuan membandingkan karakteristik curah hujan tahun normal (2022) dan tahun *El-Nino* (2023) serta menganalisis pengaruhnya terhadap limpasan permukaan di DAS Way Lima, Pesawaran. Penelitian menggunakan metode *Soil Conservation Service–Curve Number* (SCS-CN) dengan parameter curah hujan harian, penggunaan lahan, *Hydrologic Soil Group* (HSG), dan *Antecedent Moisture Condition* (AMC). Data curah hujan diperoleh dari empat pos hujan, kemudian dianalisis untuk menghitung limpasan bulanan dan tahunan. Hasil penelitian menunjukkan bahwa tahun *El-Nino* mengalami penurunan curah hujan yang diikuti penurunan limpasan permukaan. Total limpasan menurun dari 477,56 mm pada tahun normal menjadi 370,68 mm pada tahun *El-Nino* atau berkurang sekitar 22,4%. Namun, hujan berintensitas tinggi setelah periode kering tetap menghasilkan limpasan signifikan akibat menurunnya kapasitas infiltrasi tanah. Penelitian ini menyimpulkan bahwa variabilitas curah hujan akibat *El-Nino* berpengaruh nyata terhadap besarnya limpasan permukaan sehingga penting sebagai dasar pengelolaan sumber daya air dan mitigasi bencana hidrometeorologi di wilayah DAS.

Kata kunci : DAS Way Lima, Limpasan permukaan, Metode SCS-CN *Curve Number, El-Nino*, Variabilitas curah hujan.

ABSTRACK

PREDICTION OF SURFACE RUNOFF UNDER NORMAL RAINFALL AND EL-NINO–INDUCED RAINFALL CONDITIONS IN 2023 USING THE SOIL CONSERVATION SERVICE (SCS) METHOD IN THE WAY LIMA WATERSHED, PESAWARAN

By

Gihon Tua Pardede

El-Nino triggers climate anomalies that alter rainfall patterns and distribution, thereby affecting hydrological responses within a watershed. This study aimed to compare rainfall characteristics between a normal year (2022) and an El-Nino year (2023) and to analyze their influence on surface runoff in the Way Lima Watershed, Pesawaran. The Soil Conservation Service–Curve Number (SCS-CN) method was applied using daily rainfall data, land use, Hydrologic Soil Group (HSG), and Antecedent Moisture Condition (AMC) parameters. Rainfall data were obtained from four rain gauge stations and analyzed to estimate monthly and annual runoff. The results showed that the El-Nino year experienced reduced rainfall followed by decreased surface runoff. Total runoff declined from 477.56 mm in the normal year to 370.68 mm in the El-Nino year, representing a reduction of approximately 22.4%. However, high-intensity rainfall occurring after prolonged dry periods still produced considerable runoff due to reduced soil infiltration capacity. This study concludes that rainfall variability driven by El-Nino significantly influences surface runoff magnitude, highlighting its importance for water resource management planning and hydrometeorological disaster mitigation in watershed areas.

Keywords : *Way Lima Watershed, Surface runoff, SCS-CN method, Curve Number, El-Nino, Rainfall variability.*