

link; <file:///C:/Users/HP/Downloads/24987-Article%20Text-92988-1-10-20250717-1.pdf>

Mitigating Flood Peak Discharge with Biopore Absorption Holes (BAH) to Reduce Surface Runoff: Case Study of the Tanralili Sub-watershed

Amrullah Mansida*

Master of Water Resources Department, Faculty of Engineering, Universitas Muhammadiyah E-mail: amrullah.mansida@unismuh.ac.id

Farida Gaffar

Civil Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Makassar E-mail: farida@unismuh.ac.id

Muh. Amir Zainuddin

Civil Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Makassar E-mail: amirzainuddin@unismuh.ac.id

Abstract

Land use changes in the Tanralili Sub-DAS, Maros Regency, South Sulawesi Province have a significant impact on hydrological dynamics, increasing surface runoff and accelerating the peak flood discharge period. Most of the land, 75.51%, is converted into mixed dryland agriculture and rice fields, leaving 24.49% for econdary dryland forests, industrial plantation forests, shrubs, vegetation on grass and open land, so that this land becomes critical. This study examines the performance of Biopore Absorption Holes (BAH) in reducing flood risk by increasing infiltration and reducing runoff. The experiment was conducted on soil with moderate permeability (0.00178 cm/s), utilizing PVC BAH units with a diameter of 10 cm and a length of 100 cm, with biopores ≥ 10 mm. BAHs were placed at three points on mixed dryland agriculture, shrubs, and open land. These BAHs were placed on a slope of 0.23% and tested under various rainfall intensities (I2, I5, I10). Using Mononobe equation for surface runoff, peak discharge with Nakayasu HSS. The results showed a decrease in peak flood discharge by 58.12% and an increase in infiltration by 60.16%. The findings indicate the potential of BAH as an environmentally friendly solution for flood mitigation.

Keywords: Surface runoff, infiltration rate, peak flood discharge, performane biopore absorption holes.