

PEMODELAN SPASIAL GENANGAN AKIBAT LUAPAN BANJIR DI SUNGAI PEMALI, KABUPATEN BREBES, PROVINSI JAWA TENGAH

Kukuh Tri Jayanto^[1] Puji Utomo., S.T., M.Eng^[2]

Program Studi Teknik Sipil Fakultas Sains dan Teknologi Universitas Teknologi Yogyakarta;
e-mail:[1] kukuhjaya182@gmail.com, [2] mr.pujiutomo@gmail.com

ABSTRAK

Sungai Pemali memiliki aliran yang cukup besar pada saat musim hujan dan sering menimbulkan banjir yang menggenangi daerah bantaran sungai Pemali. Penelitian ini bertujuan untuk mengetahui kondisi genangan akibat luapan banjir yang terjadi. Manfaat penelitian ini dapat mengetahui debit maksimum yang dihasilkan debit rancangan, mengetahui titik luapan sungai Pemali akibat debit banjir. Dalam menghitung debit banjir sungai Pemali berbagai periode kala ulang digunakan metode HSS Snyder terhadap data curah hujan yang diambil dari stasiun Dukuh Jeruk tahun 2010-2019. Hasil dari simulasi dibuat dengan program *HEC-RAS 5.0.7* dan di tampilkan secara peta *spasial* dengan program *ARCGIS 10.8* dengan kala ulang 2, 5, 10, 25, 50, dan 100 tahun. Rata-rata genangan akibat luapan yang di dapat ialah 1,0336 m di kala ulang 2 tahun, 1,0338 m di kala ulang 5 tahun, 1,0663 m di kala ulang 10 tahun, 1,1471 m di kala ulang 25 tahun, 1,2481 m di kala ulang 50 tahun, dan 1,4429 m di kala ulang 100 tahun. Dampak genangan akibat luapan paling parah berada di kecamatan Larangan yang mengalami banjir setinggi 3,028 m dikala ulang 2 tahun, 3,95 m dikala ulang 5 tahun, 4,974 m dikala ulang 10 tahun, 5,714 m dikala ulang 25 tahun, 6,776 m dikala ulang 50 tahun, dan 7,171 m dikala ulang 100 tahun. Dalam penggunaan tanggul dampak genangan akibat luapan paling parah juga masih berada di Kecamatan Larangan yang mengalami banjir setinggi 1,781 m dikala ulang 2 tahun, 2,454 m dikala ulang 5 tahun, 3,72 m dikala ulang 10 tahun, 4,537 m dikala ulang 25 tahun, 6,776 m dikala ulang 50 tahun, dan 6,078 m dikala ulang 100 tahun.

Kata kunci: Debit Banjir, HSS Snyder, HEC-RAS 5.0.7, ARCGIS 10.8

SPATIAL MODELING OF FLOOD DUE TO FLOOD OVERLOAD IN THE PEMALI RIVER, BREBES REGENCY, CENTRAL JAVA PROVINCE

ABSTRACT

The Pemali River has a relatively large flow during the rainy season and often causes floods that inundate the area along the Pemali River. This study aims to determine the condition of inundation due to flooding. The benefit of this research is to know the maximum discharge produced by the design discharge and the overflow point of the Pemali river due to flood discharge. In calculating the flood discharge of the Pemali river for various return periods, the HSS Snyder method was used for rainfall data taken from the Dukuh Jeruk station in 2010-2019. The simulation results were made using the HEC-RAS 5.0.7 program and displayed on a spatial map using the ArcGIS 10.8 program with a return period of 2, 5, 10, 25, 50, and 100 years. The average inundation due to overflow obtained is 1.0336 m at the 2-year return period, 1.0338 m at the 5-year return period, 1.0663 m at the 10-year return period, 1.1471 m at the 25-year return period, 1.2481 m on the 50th birthday, and 1.4429 m on the 100th birthday. The impact of inundation due to overflow was the most severe in the Larangan sub-district, which experienced flooding as high as 3,028 m on the second anniversary, 3.95 m on the fifth anniversary, 4,974 m on the tenth anniversary, 5,714 m on the 25th anniversary, 6,776 m on the 50th anniversary. And 7.171 m on the 100th anniversary. In using the embankment, the impact of inundation due to the worst overflow is still in Larangan District, which experienced flooding as high as 1,781 m on the second anniversary, 2,454 m on the fifth anniversary, 3.72 m on the tenth anniversary, 4,537 m on the 25th anniversary, 6,776 m on the 50th anniversary, and 6,078 m on the 100th birthday.

Keywords: Flood Discharge, HSS Snyder, HEC-RAS 5.0.7, ARCGIS 10.8