

# ESTIMATION OF FLOOD AFFECTED AREAS ALONG THE FLOW OF CODE RIVER

by Suhadi Purwantara, Nurul Khotimah, Dyah Respati Suryo Sumunar, Arif Ashari

## ABSTRACT

The rapid development of settlements around the Code River and supported by the presence of silt caused the drainage conditions in the Code River to become narrower so that the greater the impact of flooding and the extent of its distribution. This study aims to: (1) estimate the maximum rainfall occurring in the Code River, (2) predict the probability of flooding in the Code River, and (3) predict areas prone to flooding on the Code River.

The design of this research is descriptive research. The study was conducted on the Code River which flows along Sleman Regency, Yogyakarta City, and Bantul Regency. The study was conducted in February-August 2018. The variables used in this study were rainfall intensity and flowrate variables. The data used is collected through observation activities, interpretation of remote sensing images, library studies, and documentation. The data that has been collected is then analyzed using the Log Pearson Type III method for analysis of rain plans, Weibull formula for flood probability analysis, and rational methods for analysis of the maximum discharge plan.

The results of this study indicate that: (1) the maximum amount of rainfall in the Code River estimated using Pearson Type III Log, obtained data of planned rainfall with a return period of  $R_5 = 106.83$  mm,  $R_{10} = 116.67$  mm,  $R_{25} = 127.30$  mm,  $R_{50} = 134.25$  mm,  $R_{100} = 140.57$  mm, and  $R_{200} = 146.39$  mm, (2) the probability of flooding in the River Code predicted from the maximum discharge caused by the planned rain, for the return period  $Q_5 = 2,269,637$  m<sup>3</sup> / sec,  $Q_{10} = 4,957,381$  m<sup>3</sup> / sec,  $Q_{25} = 13,522,640$  m<sup>3</sup> / sec,  $Q_{50} = 28,521,829$  m<sup>3</sup> / sec,  $Q_{100} = 59,729,066$  m<sup>3</sup> / sec, and  $Q_{200} = 124,404,041$  m<sup>3</sup> / sec, (3) flood-prone areas in the Code River predicted from the inundation area of ??the flood target area show that flooding will occur in all return periods, namely 5, 10, 25, 50, 100, and 200 years. Inundation of the flood target area in the 5 year return period covering 24.09 km<sup>2</sup>, a 10 year return period of 53.14 km<sup>2</sup>, a 25 year return period of 145.74 km<sup>2</sup>, a 50 year return period of 307.89 km<sup>2</sup>, a 100 year return period covering an area of 645.27 km<sup>2</sup>, and a 200 year return period covering an area of ??1,344.46 km<sup>2</sup>.

Kata Kunci: *disasters, floods, estimation of flood affected areas, Code River*