

## INTISARI

Sungai Dengkeng yang melintasi Kecamatan Cawas mengakibatkan banjir setiap tahunnya. Sungai yang berhulu di Gunung Merapi dan bermuara di Sungai Bengawan Solo ini menimbulkan kerugian ekonomi akibat banjir yang menggenangi permukiman, lahan pertanian dan pusat perekonomian di Kecamatan Cawas. Lokasi penelitian berada pada 3 desa yaitu: Desa Plosowangi, Desa Bawak dan Desa Cawas.

Tujuan dari penelitian ini yaitu 1) memodelkan sebaran spasial luapan banjir periode ulang 2, 5, 10, 25, dan 50 tahun; 2) menganalisis besaran kerugian ekonomi sektor pertanian, permukiman, industri dan UMKM berbasis skenario luapan banjir kala ulang. Model 1D *Unsteady Flow* HEC RAS digunakan untuk mensimulasi banjir. Data yang digunakan meliputi: DTM dan Orthophoto dari akusisi UAV, peta jaringan sungai, peta RBI, data curah hujan, serta informasi kejadian dan lamanya banjir aktual. Analisis kerugian ekonomi akibat banjir menggunakan pendekatan pendapatan yang hilang untuk rumah tangga, biaya penanaman untuk lahan pertanian, dan omzet harian untuk industri dan UMKM.

Hasil penelitian menunjukkan bahwa model HEC RAS cukup baik mensimulasikan banjir kala ulang 5 tahun. Hasil simulasi menunjukkan bahwa luas area dan kedalaman banjir akan meningkat dengan bertambahnya periode ulang. Besarnya kerugian di sektor UMKM lebih tinggi dibandingkan sektor pendapatan rumah tangga, industri dan pertanian. Total kerugian ekonomi akibat banjir untuk sektor IKM, UMKM dan pendapatan rumah tangga untuk skenario banjir 1 hari pada kala ulang 2, 5, 10, 25 dan 50 tahun masing-masing sebesar Rp217,96 juta, Rp224,57 juta, Rp227,82 juta, Rp237,19 juta, dan Rp240,22 juta. Sedangkan Total kerugian ekonomi akibat banjir untuk sektor IKM, UMKM, pendapatan rumah tangga dan pertanian untuk skenario banjir 3 hari pada kala ulang 2, 5, 10, 25 dan 50 tahun masing-masing sebesar Rp856,87 juta, Rp911,72 juta, Rp942,45 juta, Rp1,012 milyar, dan Rp1,091 milyar.

Kata Kunci: UAV, UMKM, DEM, model hidrologi, Sungai Dengkeng

## ABSTACT

The Dengkeng River that crosses Cawas District causes flooding every year. The river that originates from Mount Merapi and empties into the Bengawan Solo River causes losses due to flooding that inundates settlements, agricultural land and economic centers in Cawas District. The research location is in 3 villages: Desa Plosowangi, Desa Bawak and Desa Cawas.

The objectives of this study are 1) to model the spatial distribution of flood overflows with return periods of 2, 5, 10, 25, and 50 years; 2) to analyze the magnitude of economic losses in the agricultural, settlement, industrial and UMKM sectors based on flood overflow scenarios with return periods. The one-dimensional HEC RAS model is used to simulate flooding while the damage model is used to estimate losses due to flooding. The data used include: DTM and Orthophoto from UAV acquisition, river network maps, RBI maps, rainfall data, and information on the occurrence and duration of actual floods. Analysis of economic losses due to flooding using the approach of lost income for households, planting costs for agricultural land, and daily turnover for industry and UMKM.

The results showed that the HEC RAS model is quite good at simulating floods with a 5-year return period. The simulation results show that the area and depth of the flood will increase as the return period increases. The magnitude of losses in the UMKM sector is higher than the household income, industry and agriculture sectors. The total economic losses due to flooding for the UMKM, IKM and household income sectors for the 1-day flood scenario at return periods of 2, 5, 10, 25 and 50 years are respectively IDR217.96 million, IDR224.57 million, IDR227.82 million, IDR237.19 million, and IDR240.22 million. Meanwhile, the total economic losses due to flooding for the IKM, UMKM, household income and agricultural sectors for the 3-day flood scenario at return periods of 2, 5, 10, 25 and 50 years were Rp856.87 million, Rp911.72 million, Rp942.45 million, Rp1.012 billion, and Rp1.091 billion.

**Keywords:** UAV, UMKM, DEM, hydrological model, Dengkeng River.