

INTISARI

Banjir yang terjadi pada 25 Desember 2007 akibat meluapnya Sungai Glugu telah melumpuhkan aktifitas kehidupan selama ± 1 minggu di Kota Purwodadi Kabupaten Grobogan. Banjir tersebut merupakan banjir terbesar setelah kejadian banjir serupa pada tahun 1992. Berdasarkan kondisi tersebut diperlukan kajian terhadap faktor penyebab banjir ditinjau berdasarkan fenomena riil hidrologi dan karakteristik hidraulika sehingga didapatkan upaya pengendaliannya secara optimal.

Analisis faktor penyebab banjir meliputi pengaruh curah hujan, tata guna lahan, *bank full capacity* dan kontribusi *backwater*. Pengaruh hujan dianalisis dengan membandingkan debit (Q) Sungai Glugu akibat *high outliers* dengan Q sesuai *threshold* seri hujan. Pengaruh tata guna lahan diperoleh dengan membandingkan Q berdasar CN tahun 1999 dengan CN tahun 2007. Pengaruh *backwater* Sungai Lusi yang merupakan muara Sungai Glugu dianalisis dengan melihat pengaruhnya terhadap Sungai Glugu. Simulasi permodelan aliran hidraulika dilakukan dengan menggunakan *software* HEC-RAS versi 4.0.

Hasil penelitian menunjukkan bahwa faktor dominan penyebab banjir Sungai Glugu adalah *backwater* Sungai Lusi, *bank full capacity* yang kecil, dan pengaruh hujan 25 Desember 2007. *Backwater* menaikkan elevasi muka air maksimum sebesar 20%-100% sepanjang 3.10 km dan banjir akibat *backwater* membutuhkan waktu 4.3 kali lebih lama untuk surut. Penanganan banjir jangka pendek ($Q_{10} = 260 \text{ m}^3/\text{s}$) dan jangka panjang ($Q_{25} = 373 \text{ m}^3/\text{s}$) berupa normalisasi dan peninggian tanggul mampu menurunkan elevasi muka air sekitar 35 % dan meningkatkan kecepatan sepanjang ruas mencapai 55 % dibanding sebelum penanganan.

Kata kunci : faktor dominan penyebab banjir, HEC-RAS, penanganan banjir

ABSTRACT

Flood happened on 25th Dec 2007 as result of bubbling up Glugu River has paralysed life activity during \pm 1 week in Kota Purwodadi Kabupaten Grobogan. The flood is the biggest one of similar flood expost in the year of 1992. Based on the condition, it is required to study the cause of flood which is evaluated based on real phenomenon of hydrology and hydraulic characteristic to obtain optimal flood control.

This research is conducted to analyse flood cause factors including rainfall effect, land use change, bank full capacity and backwater contribution. Rainfall effect is analysed by comparing discharge (Q) of Glugu River as result of high outliers with discharge (Q) based on threshold rain series. The influence of land use change is obtained by comparing discharge calculated based on CN of 1999 and CN of 2007. Backwater influence of Lusi River as estuary of Glugu River is analysed by checking its influence to Glugu River. Simulation of hydraulic flow model is done by using HEC-RAS version 4.0 software.

Result of this research indicates that dominance factor of flood are backwater of Lusi River, bank full capacity which is small, and rain influence on 25th Dec 2007. Backwater increases elevation of maximum water surface equal to 20%-100% along the length of 3.10 kms and flood as result of backwater requires 4.30 longer times to withdraw. Flood control of short term period ($Q_{10} = 260 \text{ m}^3/\text{s}$) and long-range ($Q_{25} = 373 \text{ m}^3/\text{s}$) in the form of river normalization and flood levee can reduce elevation of maximum water surface around 35 % and increases channel velocity along the length of river station until 55 % compared to existing one.

Keywords : dominance factor of flood, HEC-RAS, flood control