PENGELOLAAN DAERAH ALIRAN SUNGAI MELALUI PEMANFAATAN WISATA ARUNG JERAM SERTA POTENSI BAHAYA BANJIR LAHAR DI SUNGAI TELAGAWAJA DAS UNDA, BALI

INTISARI

Sungai Telagawaja yang berada di DAS Unda dan secara administratif terletak di Kabupaten Klungkung dan Kabupaten Karangasem, Provinsi Bali. Sungai tersebut telah dimanfaatkan sebagai wisata arung jeram. Sungai Telagawaja belum memiliki informasi terkait karakteristik fisik sungai, sehingga membahayakan wisatawan dalam berwisata arung jeram. Sungai Telagawaja berada dalam kawasan rawan bencana (KRB) erupsi Gunung Agung sehingga ketika curah hujan tinggi, terjadi banjir lahar yang dapat membahayakan wisatawan, merusak tebing sungai serta menyebabkan perubahan terhadap morfologi sungai.

Penelitian ini bertujuan, (1) menganalisis sebaran spasial tingkat kesulitan sungai berdasarkan grade jeram, (2) menganalisis potensi bahaya banjir lahar melalui pemodelan dengan menggunakan *LaharZ*, (3) melakukan kajian strategi pengelolaan DAS berdasarkan potensi wisata arung jeram serta bahaya banjir lahar di Sungai Telagawaja, DAS Unda.

Metode yang digunakan dalam penelitian ini adalah deskriptif kuantitatif. Untuk memperoleh tujuan satu dilakukan survei lapangan menggunakan Global Positioning System (GPS) serta ekstraksi *DEM Terrasar-X*, selanjutnya dianalisis menggunakan Sistem Informasi Geografis (SIG). Untuk memperoleh tujuan dua dilakukan pemodelan banjir lahar skenario 1 jt m^3, 5 jt m^3 dan 10 jt m^3 dengan DEM TerrasarX melalui *Toolbox LaharZ* pada perangkat lunak ArcGIS 10.6. Tujuan ketiga dilakukan secara deskriptif berdasarkan potensi DAS sebagai sektor pariwisata serta potensi terhadap bahaya banjir lahar Gunung Agung.

Hasil penelitian ini menunjukkan bahwa wisata arung jeram Sungai Telagawaja mempunyai grade jeram tingkat I sampai dengan V. Grade I pada Sungai Telagawaja mempunyai panjang arungan 2.326,68 m, Grade II (2.753,02 m) , Grade III (2.876,32 m), Grade IV (3.237,61 m) dan Grade V dengan panjang arungan 2.361,03 m . DAS Unda masuk dalam KRB Erupsi Gunung Agung. KRB 1 mempunyai total luas sebesar 8.428,34 Ha, KRB 2 (1.687,39 Ha) dan KRB 3 (12.903,94 Ha). Skenario lahar dengan volume 1 jt m^3 mempunyai total luas genangan 202,63 Ha, Skenario volume 5 jt m^3 (389,31 Ha) dan 10 jt m^3 (227,70 Ha). Potensi banjir lahar sebagai dasar pengelolaan Sungai Telagawaja DAS Unda, sehingga memberikan kewaspadaan terhadap pengelola pariwisata serta sebagai dasar pengelolaan sungai Telagawaja akibat terjangan banjir lahar yang dapat merugikan terhadap pariwisata dalam DAS Unda. Arahan pengurangan dampak terhadap banjir lahar dapat dilakukan melalui zonasi kawasan lindung, pembuatan bangunan teknis penahan tebing, pengaturan masyarakat penambang pasir, serta integrasi kelembagaan mulai dari masyarakat setempat, pengelola wisata arung jeram, pemerintah serta akademisi.

Kata Kunci : *Pengelolaan DAS, Sungai Telagawaja, Wisata Arung Jeram, banjir Lahar, Sistem Informasi Geografis (SIG).*

WATERSHED MANAGEMENT BY UTILIZATION OF RAFTING TOURISM AND THE POTENTIAL OF LAVA FLOOD HAZARDS IN THE TELAGAWAJA RIVER, UNDA WATERSHED, BALI

ABSTRACT

Telagawaja River which is in the Unda watershed and administratively is located in Klungkung Regency and Karangasem Regency, Bali Province. The river has been used as a rafting tour. The Telagawaja River does not yet have information regarding the physical characteristics of the river, thus endangering tourists on rafting trips. Telagawaja River is located in a disaster-prone area of the eruption of Mount Agung so that when the rainfall is high, lava floods occur which can endanger tourists, damage riverbanks, and cause changes to river morphology.

This study aims, (1) to analyze the spatial distribution of river difficulty levels based on the grade of rapids, (2) to analyze the danger of lahar flooding through modeling using LaharZ, (3) to study watershed management strategies based on rafting tourism potential and the danger of lahar flooding on the Telagawaja River, Unda watershed.

The method used in this research is descriptive quantitative. To obtain the first objective, a field survey was conducted using the Global Positioning System (GPS) and the extraction of Terrasar-X DEM, then analyzed using a Geographic Information System (GIS). To obtain the second objective, modeling of lava flood scenarios of 1 million m^3, 5 million m^3, and 10 million m^3 was carried out using TerrasarX DEM through the LaharZ Toolbox on ArcGIS 10.6 software. The third objective was carried out descriptively based on the potential of the watershed as a tourism sector and the potential for the danger of Mount Agung's lava flood.

The results of this study indicate that the Telagawaja River rafting tour has grades of level I to V rapids. Grade I on the Telagawaja River has a rafting length of 2,326.68 m, Grade II (2.753.02 m), Grade III (2.876.32 m), Grade IV (3,237.61 m) and Grade V (2,361.03 m). The Unda watershed is included in the KRB of the Mount Agung eruption. Hazard zone 1 has a total area of 8,428.34 Ha, hazard zone 2 (1,687.39 ha) and hazard zone 3 (12903.94 ha). Scenario lava with a volume of 1 million m^3 has a total area of 202.63 ha puddle, Scenario volume of 5M m3 (389.31 ha), and 10 million m^3 (227.70 Ha) Prediction of lahar floods as the basis for managing the Telagawaja River in the Unda watershed, thereby providing vigilance to tourism managers and as the basis for managing the Telagawaja river due to the brunt of lahar floods which can be detrimental to tourism in the Unda watershed. Directions for reducing the impact of lahar floods can be done through area zoning protection, construction of rock retaining technical buildings, regulation of sand mining communities, as well as institutional integration from local communities, rafting tour managers, government, and academics.

Keywords: *Watershed Management, Telagawaja River, Rafting Tour, Lava Flood, Geographic Information System (GIS).*