

PENILAIAN KERENTANAN BANGUNAN TERHADAP BENCANA TSUNAMI MENGGUNAKAN MODEL PTVA-4 DI DESA PESANGGARAN BANYUWANGI

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INTISARI

Indonesia terletak pada pertemuan tiga lempeng tektonik aktif yang membentuk jalur subduksi. Kondisi tektonik tersebut menyebabkan Indonesia rawan akan bencana alam, khususnya tsunami. Tsunami menjadi bencana alam yang mengancam wilayah pesisir. Tsunami kerap terjadi di Indonesia, salah satunya terjadi di pesisir selatan Kabupaten Banyuwangi pada tahun 1994. Wilayah pesisir Desa Pesanggaran Banyuwangi padat akan bangunan dengan berbagai fungsi (hunian, usaha, sosial budaya, dan keagamaan). Kepadatan bangunan di wilayah pesisir meningkatkan risiko bencana, dalam hal ini dipengaruhi oleh faktor kerentanan fisik bangunan. Dengan demikian, penelitian ini bertujuan untuk memetakan dan mendeskripsikan zona genangan tsunami, kerentanan bangunan, dan kerentanan bangunan berdasarkan fungsi bangunan terhadap bencana tsunami di wilayah pesisir Desa Pesanggaran.

Metode yang digunakan dalam penelitian ini adalah model *Papathoma Tsunami Vulnerability Assessment – 4* (PTVA-4). Pemodelan genangan tsunami Berryman juga digunakan untuk mendapatkan zona genangan tsunami di wilayah kajian. Skenario ketinggian tsunami mengacu pada hasil penelitian Widiyantoro *et al.* (2020) yang menyatakan bahwa skenario terburuk ketinggian tsunami di selatan Pulau Jawa bagian timur dapat mencapai 12 meter.

Hasil penelitian menunjukkan bahwa bangunan di wilayah kajian memiliki nilai *Relative Vulnerability Index* (RVI) antara 0,62 – 3,47. Nilai tersebut diklasifikasikan menjadi tiga kelas kerentanan, yaitu kerentanan rendah, sedang, dan tinggi. Sebanyak 167 bangunan tergolong dalam kerentanan rendah, 63 bangunan kerentanan sedang, dan 173 bangunan kerentanan tinggi. Selain itu, kerentanan bangunan berdasarkan fungsi bangunan memiliki nilai kerentanan yang berbeda-beda. Hal ini dipengaruhi oleh kondisi struktural setiap bangunan, pola persebaran bangunan, dan jangkauan genangan tsunami.

Kata kunci: Tsunami, Kerentanan, Bangunan, PTVA-4.

ASSESSMENT OF THE VULNERABILITY OF BUILDINGS TO TSUNAMI DISASTERS USING THE PTVA-4 MODEL IN PESANGGARAN VILLAGE BANYUWANGI

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ABSTRACT

Indonesia is situated at the intersection of three active tectonic plates that form subduction routes. Indonesia is vulnerable to natural disaster, especially tsunamis, because of its geological circumstances. A natural disaster that poses a hazard to coastal communities is tsunamis. Indonesia frequently experiences tsunamis, one of which struck the southern Banyuwangi Regency shore in 1994. Pesanggaran Banyuwangi Village's coastal region is densely populated with building for a variety of purposes, including residential, commercial, socio-cultural, and religious. Building density along coastlines raises disaster risk, which is in turn determined by how vulnerable individual buildings are to natural disasters. As a result, the study's two main objectives are to map and describe the tsunamis inundation zone, vulnerability of buildings, building vulnerability depending on the function of the building to the tsunami disaster in the coastal area of Pesanggaran Village.

The Papathoma Tsunami Vulnerability Assessment 4 (PTVA-4) model was employed in this study as a methodology. The tsunami inundation zone in the research area was also determined using Berryman's tsunami inundation modeling. The tsunami height scenario is based on research by Widiyantoro *et al.* (2020), which found that a tsunami might reach a height of 12 meters in the south of eastern Java Island.

Buildings in the research area have a Relative Vulnerability Index (RVI) rating that ranges from 0.62 to 3,47, according to the findings. This rating is divided into three categories of vulnerability: low, medium, and high. A total of 167 buildings are deemed to be lowly vulnerable, 63 as mediumly vulnerable, and 173 as highly vulnerable. Additionally, the susceptibility of buildings varies depending on the function of the building. This is caused by the structural state of each building, how they are distributed, and how much of the area was flooded by the tsunami.

Keywords: Tsunami, Vulnerability, Building, PTVA-4