

Design and Development of a Web-Based Geographic Information System for Mapping Waste Disposal Sites in Nganjuk Regency

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ABSTRACT

Nganjuk Regency faces significant challenges in waste management due to population growth, with waste generation reaching 11,727.13 tons per day in 2024. The main problems identified include the lack of public awareness and difficulties in locating nearby Temporary Waste Disposal Sites (TPS) due to limited available information. This study aims to develop a web-based Geographic Information System (GIS) for mapping Temporary Waste Disposal Sites (TPS) in Nganjuk Regency using the Feature Driven Development (FDD) method and the Haversine algorithm to determine the nearest locations. The technologies used in this development include PHP, Laravel, Bootstrap, as well as the integration of OpenStreetMap and LeafletJS libraries to present interactive spatial data. System testing was conducted in two stages: Black Box Testing to evaluate system functionality and the System Usability Scale (SUS) to assess user satisfaction. The results of Black Box Testing showed a validity level of 100%, indicating that all system scenarios functioned as expected. Based on the usability evaluation using SUS, an average score of 75.6 was obtained from 100 community respondents, which falls into the Good and Acceptable categories. Testing with 3 admin respondents resulted in an average score of 80.8, also categorized as Good and Acceptable. The developed GIS is considered effective, feasible to use, and capable of assisting the community and relevant stakeholders in mapping and locating Temporary Waste Disposal Sites (TPS) in Nganjuk Regency more easily and accurately.

Keywords: *Geographic Information System, Waste Disposal Sites, Feature Driven Development, Haversine, System Usability Scale.*