

GIS-BASED ASSESSMENT OF ENVIRONMENTAL NOISE IN A UNIVERSITY CAMPUS

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ABSTRACT

Environmental noise, driven by intensive academic activities and vehicular traffic at the Air Tawar Campus of Universitas Negeri Padang, poses significant risks to comfort, concentration, and health, necessitating spatial assessment to support effective campus environmental management. This study evaluated noise levels during operational hours and mapped their spatial distribution using a Geographic Information System (GIS). A quantitative descriptive approach was applied, with noise measurements collected using a Sound Level Meter (SLM) at 12 sampling locations during morning, midday, and afternoon periods. Data were analyzed descriptively and interpolated using the Inverse Distance Weighted (IDW) method to generate a noise distribution map. Measured values were compared with the Indonesian environmental noise standard (Decree of the Minister of Environment No. Kep-48/MENLH/11/1996). Average noise levels ranged from 43.86 to 64.34 dBA. The highest level was recorded at the Faculty of Sports Science (64.34 dBA), while the lowest occurred at the Faculty of Mathematics and Natural Sciences (43.86 dBA). Most sites exceeded the educational noise limit of 55 dBA. High noise levels clustered near major roads and areas of intensive student and vehicle activity, whereas quieter zones were located farther from traffic corridors. These findings provide a basis for noise mitigation and sustainable campus planning.

Keywords: environmental noise; traffic noise; geographic information system (gis); spatial analysis; sustainability