Perancangan Sistem Informasi Geografis (Gis) Berbasis Website Untuk Pemetaan Dan Analisis Lokasi Usaha Hidroponik Di Kabupaten Pasuruan

(Design of a Website-Based Geographic Information System (GIS) for Mapping and Analyzing Hydroponic Business Locations in Pasuruan Regency)

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ABSTRACT

The increasing conversion of agricultural land in Pasuruan Regency has created an urgent need for alternative farming systems such as hydroponics, yet the sector's growth remains constrained by the absence of an integrated mapping system that limits access to information on business locations, distribution routes, and harvest prices for farmers, distributors, and local governments. To address this, a website-based Geographic Information System named Hydromap was developed using the Waterfall model, combining the Weighted Sum Model (WSM) with direct weighting across three criteria — road accessibility (40%), proximity to markets (35%), and price analysis (25%) — alongside Min-Max Normalization for price recommendations and the Haversine formula for distance calculation, all built on the Laravel framework, Leaflet.js, and MySQL. Field surveys of seven hydroponic business locations in Pasuruan Regency revealed that Hidroponik Geha Farm and Ms. Hidroponik achieved the highest feasibility score of 5.00 (Very Feasible), two locations were classified as Feasible, and three as Fairly Feasible, with the system additionally generating new land recommendations and estimated selling prices across eight compass directions within a 550-meter radius; Black Box Testing confirmed all 16 tested features as Valid, and USE Questionnaire-based Usability Testing among 16 respondents yielded an average score of 82.78% (Very Good), establishing Hydromap as a reliable reference for information technology-based agricultural development in Pasuruan Regency and beyond.

Keywords: *Geographic Information System, hydroponics, Direct Weighting, Weighted Sum Model, WebGIS, Pasuruan Regency*