MAPS: Mangrove Analytics and Prediction System

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Mangroves play a crucial role in coastal protection, biodiversity support, carbon sequestration, and water purification. However, between 1996 and 2020, the Philippines lost 7,934 hectares of mangroves (Bunting et al., 2022). In response, researchers developed the web application MAPS, which aims to predict future mangrove populations, highlight their economic and environmental benefits, and map mangrove forests to aid in conservation and restoration planning, address environmental challenges, and build a sustainable future. MAPS includes four sections: population, economy, environment, and mapping. This study assessed MAPS's reliability, efficiency, usability, effectiveness, and potential impact. Using Mean Absolute Error (MAE) and Percentage Error (PE), the website proved highly reliable, with errors of only 2.244% for Rhizophora apiculata and 0.216% for Rhizophora mucronata. A survey of 30 environmental advocates in Camarines Norte showed that the web application is also efficient, with average completion times of 66.95 seconds for population, 42.33 seconds for economy, 24.85 seconds for environment, and 181.33 seconds for mapping, achieving a success rate of 99.44%. Users rated MAPS as “Highly Acceptable,” with usability scoring a weighted mean of 4.725 and effectiveness at 4.84. Overall, the web application's impact on mangrove conservation and management was rated at 4.814, indicating a significant positive influence. These results demonstrate that MAPS is reliable, efficient, and highly acceptable, with considerable potential to enhance mangrove conservation and management efforts by increasing mangrove populations, supporting environmental protection, benefiting the economy, and offering sustainable solutions. Keywords: Mangroves, Prediction, Population

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