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HYDROSENTRY: AN INNOVATIVE SELF-SUFFICIENT PLANT IRRIGATION DEVICE WITH SOIL MOISTURE MONITORING AND AUTOMATED WATERING TO ENHANCE TIME MANAGEMENT OF THE PUBLIC

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ABSTRACT

Water conservation and efficient irrigation remain significant challenges in modern agriculture and gardening, particularly for individuals with limited time for plant care. This study introduces HydroSentry, a self-sufficient automated irrigation device that monitors soil moisture and optimizes watering to enhance plant hydration and time management. The research aimed to assess HydroSentry's impact on environmental sustainability, community benefits, and school gardening initiatives, as well as its ability to reduce manual irrigation efforts. Using a quasi-experimental research design, 30 farmers and gardeners from Barangay Acle, Tuy, Batangas participated in surveys, observations, and statistical analysis. Results indicated that HydroSentry significantly reduces water consumption, enhances plant health, and improves productivity. However, challenges such as technical malfunctions, over-reliance on automation, and limited user awareness were noted. The study recommends sensor accuracy improvements, IoT integration, and broader testing to enhance effectiveness. Future research should focus on increasing user accessibility and awareness to maximize HydroSentry's impact.

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