

**TECHNO-ECONOMIC ANALYSIS OF TRAPING FOR BROWN PLANT
PLOTTERS, BIRDS AND RATS USING UV LIGHT AND ULTRASONIC
WAVES BASED ON SOLAR PANELS**

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ABSTRACT

Pest infestations in rice crops are one of the factors causing reduced yields and economic losses for farmers. Pest control is generally carried out using pesticides; however, improper use can result in high costs and have an impact on the environment. This study aims to analyze the economic feasibility of a solar-powered pest repeller that utilizes ultraviolet light and ultrasonic waves as an alternative method of pest control in rice fields. The research methods employed include a techno-economic analysis, which calculates initial investment costs, Operation and Maintenance (O&M) costs, and Life Cycle Cost (LCC), as well as an investment feasibility analysis using the Net Present Value (NPV), Benefit-Cost Ratio (BCR), Discounted Payback Period (DPP), and Return on Investment (ROI) methods. The project lifespan was set at 10 years, taking into account tropical climatic conditions that can accelerate the degradation of solar power plant components. The research results show that the initial investment cost for the equipment is Rp4,618,155, the O&M costs over the project lifespan are Rp339,900.23, and the Life Cycle Cost is Rp4,958,055.23. The results of the investment feasibility analysis yielded a Net Present Value (NPV) of Rp5,127,975.58, a Benefit-Cost Ratio (BCR) of 2.23, a Payback Period (PP) of 3.51 years, and a Return on Investment (ROI) of 111.04%. Based on these results, the solar-powered pest repellent device is deemed feasible for implementation because it provides economic benefits and serves as a more efficient alternative to pesticide use for pest control.

Keywords: Techno-Economic Analysis, Investment Feasibility, Pest Traps, Ultraviolet.