EVALUATION OF SOLAR-POWERED DRIP IRRIGATION SYSTEM FOR TOWER AND CONVENTIONAL GARDENS AT BRGY. LICAONG, SCIENCE CITY OF MUÑOZ, NUEVA ECIJA

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ABSTRACT

MACARILAY, GLECY JEAN G. and **PINILE, ROCHELLE DINAH D.,** Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2023, EVALUATION OF SOLAR-POWERED DRIP IRRIGATION SYSTEM FOR TOWER AND CONVENTIONAL GARDENS AT BRGY. LICAONG, SCIENCE CITY OF MUÑOZ, NUEVA ECIJA**

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The lack of comprehensive data on tower gardens poses a significant challenge in understanding their full potential and optimizing their use in sustainable agriculture. It hinders the evaluation of their efficiency, productivity, and economic viability. To address this issue, the general objective of this study is to evaluate the solar-powered drip irrigation system for tower gardens and compare it to conventional gardens. This study focuses on evaluating the effectiveness of a solar-powered drip irrigation system implemented in Brgy. Licaong, Science City of Muñoz, Nueva Ecija, specifically determining solar power output and drip irrigation distribution uniformity, analyzing crop growth and development, yield, and production costs. By comparing this system to conventional gardening methods, the study aimed to determine the performance of the solar-powered drip irrigation system for tower gardens. The results indicate that the distribution uniformity in a tower garden is significantly higher than in a conventional garden. Results also indicate that tower gardens achieve higher yields, improved crop growth and development, and offer a sustainable and efficient approach to gardening. Tower gardens have a higher production and investment costs than the conventional gardens. However, in terms of payback period and return on investment, the tower gardens have a shorter time needed for the payback period, and the return on investment is much higher compared to the conventional gardens. Furthermore, the study recommends the use of tower gardens for lettuce cultivation, highlighting its ability to deliver higher yields, enhanced crop growth and development, and more efficient irrigation water distribution.

Keywords: *Lactuca sativa*; tower garden; solar-power; drip irrigation system; distribution uniformity

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