

## **Agro-Voltaic Simulation for Dry Areas in Sri Lanka**

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According to the United Nations, the sustainable development goals of food security and sustainable energy are in the top of the agenda. This research proposes a solution that addresses both of the above SDGs while providing a water supply that allows farming for three seasons, in contrast to two seasons as of now. In order to demonstrate the above objective, a simulation study was carried out in a tomato farm situated at the dry zone. In addition to the base case, an agro-voltaic solution was simulated by incorporating transparent solar arrays and solar pump. Tomato harvest yield under different irradiance and the amount of water quantity supplied to the crop per three days was simulated using the DSSAT agricultural simulation software. Power generation was also predicted by varying the number of strips of PV cells to obtain the required irradiance level. GRUNDFOS software was used to design the solar water pump. After conducting the economic analysis it was found that two-strip and three-strip PV panels in contrast to six strips in a typical solar module will provide the optimal agricultural and energy yields. As the proposed solution provides an optimum combination of power generation and food production, it would be a good source of income for farmers, while also contributing clean energy to the grid.

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