

Design of an Automated System to Facilitate Vertical Farming in Sri Lanka

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Compared to our ancestors, our generations are much less likely to grow our own produce for consumption due to the lack of space and time. With the advent of urbanization, an increasing number of people are moving to apartment complexes within cities where they do not have access to a garden area and are further adapting to a busy lifestyle. Although the solution to the above problem is vertical farming, it appears that the lack of an automated system to provide the nutrients is a main problem affecting vertical farming in Sri Lanka. To overcome this issue, a hydroponics based vertical system was designed that would provide the nutrients automatically to the system, while monitoring and controlling the nutrient concentration levels with the aid of pH and EC sensors. Further, the design automated the supply of nutrients to plants and increased user friendliness for harvesting and maintenance purposes and to reduce costs by implementing an economical design where enhancement-achieved/cost ratio is high. The task was carried out by collecting data on growing plants, data on required nutrients, lighting intensities and harvesting period. Afterwards an optimized model was designed for the vertical farm using CAD software. In the end, sensors were connected with the microcontroller and the design was implemented. It could be concluded that the system saves nutrient solution through the automated process and that the design is highly suitable for vertical farming in Sri Lanka.

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