

## **Implementation of low cost, automated, mobile monitoring module by means of AI for container gardening in urban areas**

P.B.H Madhusanka<sup>1</sup>, T.A.N.T Perera<sup>1,2</sup>, P Piyasena<sup>3</sup>, G.Y Jayasinghe<sup>1,\*</sup>

<sup>1\*</sup>*Faculty of Agriculture, University of Ruhuna, Matara Sri Lanka;*

<sup>2</sup>*Faculty of Technology, University of Clombo, Colombo, Sri Lanka*

<sup>3</sup>*Sri Lanka Institute of Development Administration (SLIDA), Sri Lanka*

The limited amount of space and climate variability have led to the emergence of urban agriculture mainly in agricultural countries. This has turned urban gardens to be smart, autonomous, and efficient with the trend towards interconnected devices. The main objective of this study is to build an IoT based low cost, automated, mobile monitoring module for container gardening in urban areas. This system built with NodeMCU ESP-32 has been designed and successfully examined during the study. In constructing of the device, several sensors such as environmental humidity and temperature, light, Passive Infrared Sensor (PIR), soil temperature, soil moisture sensors and a base station connecting the cloud to the whole network were used. The system will track plants on a mobile device which has the capability of providing real-time updates on crop conditions through the internet (Thingspeak). The device is capable of measuring five parameters (soil moisture, temperature of soil & air, air humidity and light intensity) at once and show all the parameters on the ThingSpeak site for user to get the idea and also this controls the light level and soil moisture levels of the pot automatically. The acquired results have been shown the performance of the device is precise. Such as collecting, logging and analyzing the irregular data from the sensors. Consequently the system is beneficial and cost effective for the commercial scale farmers as well. Farmers can be monitor their field without wasting time and resources with the help of several sensors and the alert system. With the automatic irrigation system help to reduce water wastage and it allows to use water efficiently. Therefore, the device is efficient both the farmer's as well as environment in concentration.

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