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"Gheorghe Asachi" Technical University of Iasi, Romania

AN IOT BASED DRIP IRRIGATION SYSTEM FOR VERTICAL FARMING IN RAINSHELTER

Adithya Suchithra[1], Aleena Arrackal Nellissery Shaju[1], Sona Kattumundakkal[1], Vishnupriya Remesh[1], Anu Varughese[1*], Praveena Kavungalthodi Krishnan[1], Dipak Suresh Khatawkar[1], Shwetha Shyam Mathew[2]

[1]Kelappaji College of Agricultural Engineering & Technology (KCAET), Tavanur
[2]Rajiv Gandhi Institute of Technology, Kottayam

Abstract

Irrigation has a vital role in agriculture and is one of the labour-intensive daily operations which needs automation. An Internet-of-Things (IoT) based drip irrigation system was developed to automate and irrigate the crops grown in the vertical farming structure inside the naturally ventilated rainshelter. The system was evaluated in the rainshelter (20m×10m×4m) of Precision Farming Development Centre (PFDC), KCAET, Tavanur, Kerala with Amaranthus crop during February to May, 2023 in two phases. During the 1st phase of study, Amaranthus crop was grown with manual irrigation and in the 2nd phase, IoT based drip irrigation was given. For IoT based irrigation, Node MicroController Unit (MCU) Espressif System Processor (ESP) 12-E microcontroller was coded using Arduino IDE and IoT platform Blynk was used to control the system via internet. The developed system operates the pump only when the moisture content in the soil falls below the lower threshold limit, and stops as soon as it reaches the upper limit, thus maintaining the moisture status within the threshold limit for the entire crop period. It was found that the automation system installed was successful in minimizing the use of water to the effective root zone, which increases plant quality as well as productivity. The system can also be monitored and controlled from any location with the help of an android mobile. The performance of the crop also supported the effectiveness of the developed IoT system.

Key words: drip irrigation, internet of things, rainshelter, soil moisture sensor, vertical farming

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[*] Author to whom all correspondence should be addressed: e-mail: anu.varughese@kau.in; Phone: +919495174921