

## ABSTRACT

Per capita expenditure on vegetable purchases in Indonesia in September 2021 amounted to Rp48.654 per month, representing 8.41% of total per capita expenditure. Growing vegetables independently serves as a significant alternative to meet nutritional needs. However, rapid population growth has led to a decrease in available green open spaces, especially in urban areas. Hydroponic cultivation emerges as a solution with minimal land usage, *Functioning* as a soilless planting medium. Plant growth in hydroponic systems is controlled through factors such as water, nutrients, and environmental conditions. Effective control of dissolved substances in water is crucial for plant nutrition. Nonetheless, hydroponic systems require intensive maintenance, and time constraints hinder urban residents from engaging in cultivation activities. Automated hydroponic implementation using IoT technology has been carried out in Kampung Songo, Surabaya. However, control over dissolved substances still requires improvement to cater to the nutritional needs of hydroponic plants. Hence, actions taken regarding dissolved substances will utilize an open-loop system, simplifying the proses by reducing sensor usage and employing artificial *Neural network* (ANN) estimation. Matlab software is utilized in the estimation proses to determine the ANN formula for Arduino implementation. The ANN system has provided estimated pump activation times in a single estimation cycle. However, achieving target ppm values remains challenging due to inconsistencies in sensor readings and fertilizer values.

**Keywords :** Food Security, Hydroponics, Artificial *Neural Networks* (ANN).