

ABSTRACT

Mosquito-borne diseases such as dengue fever, malaria, and Zika pose a serious public health threat, especially in tropical regions like Indonesia. Traditional mosquito control methods continue to face challenges in terms of effectiveness, efficiency, and sustainability. This study proposes the development of a mosquito population monitoring system based on the Internet of Things (IoT) and machine learning, capable of detecting and analyzing mosquito activity in real-time. The system integrates sound sensors, temperature, humidity, and carbon dioxide concentration sensors to detect environmental conditions favorable to mosquito activity. Mosquito presence is detected through the characteristic popping sound produced when mosquitoes are electrocuted by an electric trap, which is captured by a sound sensor and processed by the ESP32 microcontroller. The data is transmitted to a web dashboard and analyzed using machine learning algorithms to predict mosquito population trends. This supports timely and data-driven decision-making in disease prevention efforts. The results of implementation show that the system provides accurate real-time information, is user-friendly, and has potential for wide application in households, healthcare facilities, and public areas.

Keyword: mosquito monitoring, Internet of Things, machine learning, ESP32, electric trap, sound sensor, outbreak prediction.