

ABSTRACT

The process of coffee bean processing towards the final product of a quality cup of coffee involves several crucial stages, one of which is the coffee bean drying process. Optimal drying is crucial in producing the distinctive aroma and flavor while extending the shelf life of the coffee beans. In Indonesia, traditional sun-drying methods are often hindered by unpredictable weather, increasing the risk of contamination by pests, and the uncertainty of drying time. Various drying methods, such as rotary dryers, convective dryers, and conductive dryers, have been implemented in Indonesia. However, these conventional approaches often rely on heat sources and consume significant energy during the drying process.

In addressing these challenges, we have developed a coffee bean drying device that combines traditional methods with mechanical forced convection, supported by Internet of Things (IoT)-based monitoring of moisture levels and temperature control. The focus is on determining the maturity level of coffee beans based on their moisture content. Monitoring of moisture levels and temperature control can be performed through a mobile application.

In the application, there are 3 temperatures that can be selected as drying set points, namely 40°C, 50°C, and 60°C. To maintain the temperature during drying, the device utilizes PID control. With a hybrid forced convection method to achieve a moisture content of 12%, the device consumes 0.8 kWh of energy with a drying time of 3 hours and 10 minutes, and the accuracy level of the coffee bean moisture sensor is 99%.

Keywords: Coffee beans, Drying, IoT, Convection.