

## ABSTRACT

*Coffee bean quality classification is an important process for maintaining quality, but in Temanggung it is still done manually, making it prone to subjectivity. This study proposes a digital image-based solution using the Convolutional Neural Network (CNN) method to classify the quality of Temanggung Robusta coffee beans. Five CNN architectures were compared: VGG16, ResNet50, RetinaNet, ConvNeXt, and EfficientNetB0, through the stages of preprocessing, augmentation, training, and evaluation using accuracy and F1-score metrics. The results show that EfficientNetB0 provides the best performance with 95% accuracy and an F1-score of 0.93, as well as stability across epochs. RetinaNet recorded the highest validation accuracy of 97.5% and the lowest validation loss of 0.1283 at epoch 200, demonstrating excellent generalization capabilities. ResNet50 also showed stable performance, while VGG16 and ConvNeXt experienced overfitting. This system is expected to serve as an objective and efficient solution for coffee quality classification, supporting the digitalization of the coffee industry at the farmer and SME levels.*

**Keywords:** *classification, coffee beans Temanggung, CNN, ResNet50, ConvNext, EfficientNet*