ABSTRACT

Indonesia has heavy rainfall every year, so the soil becomes fertile. Fertile soil makes a variety of plants that can grow in Indonesia, one of which is tea plants. Research Institute for Tea and Cinchona (RITC) Gambung Ciwidey was Indonesia's first and largest tea district. RITC Gambung has an area of 636.11 hectares with various varieties and is grouped into several blocks. Each block has a picking time and a different degree of maturity. So not all farmers know the maturity of the tea plant.

In this study, a system was designed to identify the level of maturity on tea leaves using the Assamica varieties clone GMB (Gambung) 7. Sampling was taken at RITC Gambung *using a smartphone camera with a distance of 1 meter above the tea plant surface. This system is designed based on digital image processing using the Convolutional Neural Network (CNN) method with the Visual Geometry Group Network-19 (VGGNet-19) architecture.*

The design system of the maturity level identification on tea leaves is testing using original data and augmentation data. The augmentation data has the highest results are accuracy of 98.33%, loss of 0.0979 and precision of 98%. Those results use the best parameters consisting of optimizer Adam, learning rate 0.001, batch size 8 and epoch 50.

***Keywords**: Research Institute for Tea and Cinchona (RITC) Gambung, The Tea Leaves, CNN, VGGNet-19, Varieties Assamica Clone GMB 7.*