

INTISARI

Optimalisasi pengembangan kayu putih di BDH Playen dapat ditentukan melalui kajian kesesuaian lahan dan pertumbuhan tajuk kayu putih. Teknologi foto udara menggunakan UAV dan metode *deep learning* menggunakan model *Mask-RCNN* menjadi alternatif untuk mengkaji pertumbuhan tajuk kayu putih. Tujuan dari penelitian ini adalah untuk menentukan sebaran kelas kesesuaian lahan kayu putih; menguji akurasi model *Mask-RCNN* untuk menduga tajuk kayu putih; mengkaji tingkat pertumbuhan tajuk kayu putih terhadap kelas kesesuaian lahan.

Pendekatan parametrik digunakan untuk menentukan kelas kesesuaian lahan. Model *Mask-RCNN* disusun dan digunakan untuk menduga objek tajuk kayu putih beserta luasnya pada foto udara UAV di tiap kelas kesesuaian lahan. Hasil pendugaan digunakan sebagai dasar pengukuran laju pertumbuhan tajuk. Analisa keragaman (ANOVA) untuk digunakan mengkaji tingkat pertumbuhan pada masing-masing kelas kesesuaian lahan.

Dari hasil penelitian, terdapat 3 (tiga) kelas kesesuaian lahan kayu putih di BDH Playen yaitu S3 (61,7%), N1 (16%) dan N2 (22,3%). Uji akurasi model untuk menduga tajuk kayu putih ditunjukkan melalui nilai *F1-Score* sebesar 0,8381 dan ketepatan *masking* tajuk melalui nilai IoU sebesar 0,8910. Berdasarkan hasil ANOVA diketahui bahwa pertumbuhan tajuk kayu putih pada tiap kelas kesesuaian lahan berbeda secara nyata. Kelas S3 memiliki tingkat pertumbuhan tertinggi, namun kelas N1 memiliki tingkat pertumbuhan lebih rendah daripada kelas N2. Hal tersebut menunjukkan adanya factor lain yang mempengaruhi pertumbuhan tajuk kayu putih.

Kata Kunci: Kayu putih, BDH Playen, Kesesuaian Lahan, *Mask-RCNN*

ABSTRACT

Optimization of cajuput development in BDH Playen can be determined through land suitability studies and cajuput crowns growth. Aerial photography technology using UAV and deep learning method using Mask-RCNN is an alternative to study the cajuput crowns growth. The purpose of this study was to determine the distribution of land suitability classes for cajuput; measuring accuracy of the deep learning model to estimate the cajuput crowns; assessing the growth rate of cajuput crowns on each of land suitability class.

A parametric approach was used to determine the land suitability class. Mask-RCNN model was compiled and used to estimate number and size of the cajuput crowns. The results of the estimation are used as a basis for measuring the cajuput crown growth rate. Analysis of Variance (ANOVA) was used to assess the growth rate of each land suitability class.

From the research, there are 3 (three) land suitability classes for cajuput in BDH Playen, namely S3 (61.7%), N1 (16%) and N2 (22.3%). The accuracy test of the cajuput crowns detection model is shown by the F1-Score value of 0.8381 and the accuracy of the crowns masking by the IoU value of 0.8910. Based on the ANOVA results, it was found that the cajuput crowns growth rate in each land suitability class was significantly different. Class S3 has the highest growth rate, but class N1 has a lower growth rate than class N2. This shows that there are other factors that affect the cajuput crown growth.

Keywords: Cajuput, BDH Playen, Land Suitability, Mask-RCNN