ABSTRACT

PREDICTION OF OIL CONTENT IN PALM OIL WASTEWATER USING MULTISENSOR METHOD

BY

AGUNG TRI NOVRIYANDA

Predicting the oil content in palm oil liquid waste using the multisensor method is one way to measure the oil content in palm oil liquid waste more quickly and efficiently and get an accurate output value. This research aims to predict the oil content in palm oil wastewater more quickly and efficiently and to obtain accurate values using the multisensor method.

This research was conducted from June 2022 to January 2023. Waste sampling was carried out at PTPN VII Bekri Lampung. Laboratory analysis was carried out at the Basic Physics Laboratory, Department of Agricultural Engineering, Faculty of Agriculture, University of Lampung. This study used an Artificial Neural Network (ANN) with two hidden layers, learning rate 0.001, type of training tranlm and number of epochs 1000. The training process of the artificial neural network used 27 functional variations of logsig, tantig, and purelin variants. The model validation process uses some of the data that has been obtained during laboratory analysis.

The results of this study indicate model validation using 5 inputs, namely electronic conductivity (EC), temperature, dissolved oxygen (DO), turbidity and power of hydrogen (pH) input. RMSE value of 28.27 mg/l and RRMSE of 10.32 %

Keywords*: Artificial Neural Networks, Oil, Palm Oil Wastewater.*

ABSTRAK

PREDIKSI KADAR MINYAK PADA LIMBAH CAIR KELAPA SAWIT MENGGUNAKAN METODE MULTISENSOR

OLEH

AGUNG TRI NOVRIYANDA

Prediksi kadar minyak pada limbah cair kelapa sawit menggunakan metode multisensor adalah salah satu cara untuk mengukur kadar minyak pada limbah cair kelapa sawit secara lebih cepat dan efisien serta mendapatkan keluaran nilai yang akurat. Pelitian ini bertujuan untuk Memprediksi kadar minyak pada limbah cair kelapa sawit secara lebih cepat dan efisien serta mendapatkan nilai yang akurat dengan metode multisensor.

Penelitian ini dilaksanakan pada bulan juni 2022 sampai januari 2023. Pengambilan sampel limbah dilakukan di PTPN VII Bekri Lampung. Analisis laboratorium dilakukan di Laboratorium Fisika Dasar, Jurusan Teknik Pertaniaan, Fakultas Pertanian, Universitas Lampung. Penelitian ini menggunakan Jaringan Syaraf Tiruan (JST) dengan dua hidden layer, learning rate 0,001, tipe pelatihan tranlm dan jumlah epoch 1000. Proses pelatihan jaringan syaraf tiruan menggunakan 27 variasi fungsi dari varian *logsig, tansig, dn purelin.*

Hasil penelitian ini menunjukkan Validasi model dengan menggunakan 5 input yaitu input *electronical conductivity* (EC), suhu, *dissolved oxygen* (DO), *turbidity* dan *power of hydrogen* (pH). Nilai *RMSE* 28,27 mg/l dan *RRMSE* 10,32 %.

Kata Kunci : Jaringan Syaraf Tiruan, Minyak, Limbah cair kelapa sawit