SUMMARY

HERDIANTO EKA SAPUTRA. Analysis of Potential Water Availability in Oil Palm Plantation using Geographic Information System (A Case Study in PT. Perkebunan Nusantara VIII Cimulang, Bogor). Supervised by BABA BARUS and YAYAT HIDAYAT.

Indonesia is the country’s largest oil palm producer in the World with a total area of 6.78 million ha. Palm trees require water in abundance to support production. Shortages and excess water becomes a limiting factor, so that water availability is one factor limiting the production of oil palm. The study was conducted to analyze the availability of water and see its effect on the production of oil palm.

In determining the runoff potential variables of soil type and slope were used through scoring system. The results of scoring with a high value means that the area has the potential for high runoff, conversely areas that have low-level potential runoff has a low total score. High potential runoff that occurs in most areas of plantations are in the middle of the plantation. Water availability is accumulated in some areas at low and flat locations.

The relationship of physical factors with the productivity of production were analyzed by correlation, slope, soil type and potential runoff. Excess water indicates a decrease in production, because of the correlation potential runoff has significant correlation to the decline in production (the p-value <0.05) is 0.018, meaning that the lower the runoff potential, then the higher reduction of production. The decline in production occurred in Block 2, located on Reddish Brown Latosol soil type and slope of 0-8% which is the accumulation of runoff, amounting to 29.03% of the production of 26.80 tons of FFB (fresh fruit bunch) / ha / year in 2009 be 19.02 tonnes FFB / ha / year in 2010.

To meet the water needs around the plantation site (residential and other facilities) and to improve environmental sustainability, its needed recommendation for constructed ponds. Candidates for the position is contained in the flow direction ponds or basins where water flows across and under conditions of strong soil structure to hold water. The candidate sites based on the river flow patterns created from DEM (digital elevation model) are block 9, 16, 20 and 36.

Keyword: water availability, oil palm, geographic information system (GIS)