DETERMINATION OF DROUGHT STATUS BASED ON SURFACE TEMPERATURE AND SOIL MOISTURE INDEX USING LANDSAT 8 IMAGERY IN KAPANEWON PAJANGAN BANTUL DISTRICT SPECIAL REGION OF YOGYAKARTA

By: Firdauzi Wasitatama

Supervised by : Sari Virgawati

ABSTRACT

Drought occurrences are frequent in Kapanewon Pajangan, Bantul Regency. This study aims to assess soil moisture levels, land surface temperature conditions, and create a map of drought distribution using a spatial approach with the Normalize Difference Moisture Index (NDMI), Land Surface Temperature (LST), and Normalize Difference Vegetation Index (NDVI) methods based on Landsat 8 imagery. The analysis indicates that the soil moisture index can be classified into three categories: humid (206,80 ha or 6,27%), dry (2985,99 ha or 90,53%), and very dry (105,649 ha or 3,20%). The land surface temperature is classified into four categories: very low (< 22,77 °C), covering an area of 144,46 ha (4,38%); low (22,77 °C – 23,17 °C), covering an area of 231,06 ha (7,31%); medium (23,17 °C – 24,77 °C), covering an area of 2453,80 ha (74,37%); and high (> 24,77 °C), covering an area of 460,15 ha (13,95%). Kapanewon Pajangan's drought status is classified into three categories: low, medium, and high. The low class covers 477,31 ha (14,55%), the medium class covers 2589,98 ha (78,98%), and the high class covers 212,15 ha (6.47%). The *Pearson* correlation test results for soil moisture index and water content at pF 2,54 and pF 4,2 showed a strong positive correlation (r = 0,720 and 0,780). The results of the *Pearson* correlation test indicate a moderately strong positive correlation (r = 0,598) between greenness level and water content at pF 2,54, and a strong positive correlation (r = 0,783) at pF 4,2. The *Pearson* correlation test revealed a strong negative correlation (r = -0,724) between LST soil surface temperature and moisture content at pF 2,54, and a very strong negative correlation (r = -0,838) at pF 4,2. Similarly, field soil surface temperature showed a strong negative correlation (r = -0,631 and -0,787) at pF 2.54 and pF 4,2, respectively.

Keywords: Drought, *Normalize Difference Moisture Index* (NDMI), *Land Surface Temperature* (LST), *Normalize Difference Vegetation Index* (NDVI).