

**MAPPING THE DISTRIBUTION OF ORGANIC MATTER CONTENT  
USING SENTINEL-2 IMAGERY ON DRYLAND AGRICULTURE IN  
IMOIRI DISTRICT, BANTUL REGENCY,  
SPECIAL REGION OF YOGYAKARTA**

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**ABSTRACT**

Imogiri District is one of the areas that utilizes dry land for agriculture. Extensive dryland farming requires considerable time, effort, and cost to map its organic matter, necessitating a fast method with broad area coverage. Remote sensing with satellite imagery offers a solution. This research was conducted in dryland farming areas in Imogiri District, Bantul Regency, Special Region of Yogyakarta. The aim of this research is to map soil organic matter (SOM) content based on the best estimation results. The research was conducted by analyzing Sentinel-2 satellite imagery transformed using the Clay Mineral Index (CMI). Soil sampling employed a survey method, and sample point determination utilized purposive sampling based on the overlay of the clay mineral index map, slope map, and land cover map, resulting in 16 sample points and 8 validation points. Laboratory analysis was then conducted to determine soil organic matter content based on the Walkley-Black method. Data analysis in this research used simple linear regression between CMI and SOM, slope and SOM, as well as multiple linear regression between the combination of both with SOM. This research resulted in a regression model:  $\% \text{ SOM} = 4.9745 (\text{IML}) - 2.4086$ . This means that the higher the IML value, the higher the BOT value will also be. The model can be used to estimate the SOM level from Sentinel-2 image transformation. The model explains 73.8% of the variation in SOM content based on IML, with an average prediction error of approximately 0.84%.

**Keywords:** Dryland, Clay Mineral Index, Organic Matter Estimation, Regression, Sentinel-2