Estimating oil palm yields using vegetation indices derived from quickbird.

ABSTRACT

A single-date archived QuickBird satellite imagery and oil palm yield data collected over a 12-year time series were used to generate empirical oil palm yield models under Malaysian conditions. Vegetation indices and yield data were subject to correlation analysis, followed by regression modelling and model validation using standard metrics. Results showed a strong positive correlation between vegetation indices and oil palm yields, across different planting periods. Among vegetation indices, RVI showed the best correlation with oil palm yield. Empirical models were found to be significant for the 1990-2002 and the 1998-1999 planting periods. Models built using RVI and MSAVI showed a strong fit between estimated yield and observed yield. In the 1998-1999 planting period, however, only RVI and GNDVI showed reliable strength in yield estimation. Overall, findings of this study suggest that selected QuickBird-derived vegetation indices can be used to estimate oil palm yields with reliable accuracy.

Keyword: Oil palm; Satellite remote sensing; Vegetation indices; Empirical modeling.