INTISARI

Permasalahan yang ada pada citra resolusi tinggi yaitu hanya memiliki kanal spektral gelombang tampak. Untuk melakukan klasifikasi vegetasi dengan baik diperlukan kanal khusus yang sudah teruji dari berbagai penelitian yaitu dengan kanal NIR (*Near Infrared*). Saat ini, citra beresolusi tinggi gratis hanya memiliki kanal tampak saja tanpa kanal *infrared*. Maka dari itu, penelitian melakukan perbandingan indeks vegetasi dari kanal spektral gelombang tampak untuk deteksi vegetasi.

Penelitian ini menggunakan citra SPOT-7 di Kota Yogyakarta sebagai data utama dalam pengolahan indeks vegetasi 12 algoritma yaitu NDVI (*Normalized Difference Vegetation Index)*, SAVI (*Soil Adjusted Vegetation Index),* VARI (*Visible Atmospherically Resistant Index*), TGI (*Triangular Greenness Index*), RGRI (*Red-Green Ratio Index*), RGBVI (*Red-Green-Blue Vegetation Index*), NGRDI (*Normalized Green Red Difference Index*), MGRVI (*Modified Green Red Vegetation Index*), GLI (*Green Leaf Index*), ExG (*Excess Green Index*), CIVE (*Color Index of Vegetation*), dan IRG (*Red-Green Ratio Index*). *Training dataset* dibuat pada masing-masing algoritma dalam poligon pada masing-masing kuadrannya. Sebanyak masing-masing 60 data sampel *training dataset* untuk algoritma *infrared* dan 60 data sampel *training dataset* untuk algoritma kanal tampak dilakukan untuk penelitian ini. Pengolahan data dilakukan untuk menentukan algoritma terbaik berdasarkan *overall accuracy* dan hasil luasannya antara algoritma kanal *infrared* dan kanal tampak. Dilakukan uji akurasi menggunakan foto udara dari hasil klasifikasi setiap algoritmanya. Pemilihan sampel dalam uji akurasi dilakukan menggunakan perangkat lunak Katama dengan metode *stratified sampling*.

Hasil penelitian menunjukkan bahwa algoritma NDVI memiliki tingkat akurasi yang lebih tinggi dibandingkan SAVI dengan nilai overall accuracy sebesar 98,08%. Algoritma RGRI dari spektral kanal tampak menunjukkan hasil yang paling mendekati NDVI dengan selisih yang sangat kecil dalam hal luasan vegetasi dan kesesuaian lahan. Algoritma RGRI dianggap terbaik dengan tingkat akurasi sebesar 85,83%. Selain itu, algoritma VARI juga menunjukkan pola data yang serupa dengan NDVI, menunjukkan stabilitas dan konsistensi data yang tinggi. Hasil penelitian menunjukkan NDVI merupakan algoritma terbaik untuk deteksi vegetasi dan RGRI adalah algoritma terbaik dari spektral kanal tampak yang paling mendekati dengan NDVI.

Kata kunci: kanal spektral, kanal tampak, indeks vegetasi, komparasi, *infrared*, citra SPOT-7

ABSTRACT

The primary challenge associated with high-resolution imagery is that it typically only includes visible spectral channels. To accurately classify vegetation, it is essential to utilize specialized channels that have been validated through various studies, specifically the NIR (Near Infrared) channel. Currently, free high-resolution imagery only includes visible channels without the infrared channel. Therefore, this research compares vegetation indices derived from visible spectral channels for vegetation detection.

This study utilizes SPOT-7 imagery of Yogyakarta City as the primary data for processing 12 vegetation index algorithms: NDVI (Normalized Difference Vegetation Index), SAVI (Soil Adjusted Vegetation Index), VARI (Visible Atmospherically Resistant Index), TGI (Triangular Greenness Index), RGRI (Red-Green Ratio Index), RGBVI (Red-Green-Blue Vegetation Index), NGRDI (Normalized Green Red Difference Index), MGRVI (Modified Green Red Vegetation Index), GLI (Green Leaf Index), ExG (Excess Green Index), CIVE (Color Index of Vegetation), and IRG (Red-Green Ratio Index). Training datasets were created for each algorithm within polygons in each quadrant. A total of 60 training dataset samples were used for infrared algorithms and 60 training dataset samples for visible channel algorithms in this study. Data processing was conducted to determine the best algorithm based on overall accuracy and area results between infrared and visible channel algorithms. An accuracy test was performed using aerial photographs to evaluate the classification results of each algorithm. Sample selection for the accuracy test was carried out using Katama software with the stratified sampling method.

The results of the study indicate that the NDVI algorithm achieved higher accuracy compared to SAVI, with an overall accuracy of 98.08%. The RGRI algorithm, derived from the visible spectral channel, showed results most closely aligning with NDVI, with a very small difference in terms of vegetation area and land suitability. RGRI was deemed the best visible channel algorithm, with an accuracy rate of 85.83%. Additionally, the VARI algorithm exhibited data patterns similar to NDVI, indicating high data stability and consistency. The study concludes that NDVI is the best algorithm for vegetation detection, while RGRI is the best visible channel algorithm that most closely approximates NDVI.

Keywords: spectral band, visible band, vegetation index, comparation, infrared, SPOT-7 imagery