

INTISARI

INTEGRASI PENGINDERAAN JAUH DAN SISTEM INFORMASI GEOGRAFISUNTUK PEMODELAN SPASIAL POTENSI LAHAN KEPESISIRAN KAB. MUNA BARAT SULAWESI TENGGARA

Pemodelan spasial potensi lahan kepebisiran bertujuan menyusun peruntukan potensi lahan untuk arahan fungsi kawasan. Metode yang digunakan adalah metode survei melalui interpretasi citra SPOT-4 hasil rekaman 12 Oktober 2012 dan survei lapangan dilaksanakan awal Februari sampai akhir Agustus 2013 dengan jumlah titik sampel sebanyak 46. Sebelum penyusunan basis data spasial potensi lahan kepebisiran terlebih dahulu dilakukan uji kualitas basis data spasial. Hal ini bertujuan agar kompilasi basis data spasial yang digunakan dalam pemodelan spasial potensi lahan memiliki akurasi $\geq 80\%$. Hasil integrasi penginderaan jauh dan SIG dengan masukan nilai indeks kesesuaian jenis penggunaan lahan Model Fuzzy menghasilkan nilai ketelitian rata-rata sebesar 93,69%.

Integrasi data penginderaan jauh citra SPOT-4 dan analisis SIG dengan masukan nilai indeks kesesuaian jenis penggunaan lahan Model Fuzzy menghasilkan pemodelan spasial potensi lahan kepebisiran Kabupaten Muna Barat dalam enam kategori tingkat potensi lahan, yaitu : (1) potensi lahan kategori sangat tinggi seluas 20.045,32 Ha (22,13%); (2) potensi lahan kategori tinggi seluas 31.193,05 Ha (34,43%); (3) potensi lahan kategori sedang seluas 21.271,51 Ha (23,48%); (4) potensi lahan kategori rendah seluas 23.045,62 Ha (25,44 %); (5) potensi lahan kategori sangat rendah seluas 2.001,10 Ha (2,21%); dan (6) potensi lahan tidak produktif merupakan kawasan yang nilai indeks kesesuaian lahan ≤ 0 yang merupakan kawasan yang berasosiasi dengan air sehingga nilai indeks kesesuaian lahan untuk berbagai jenis penggunaan lahan tidak dapat dievaluasi seluas 2.024,80 Ha (2,24%). Hasil pemodelan spasial potensi lahan kepebisiran dengan masukan Model Fuzzy menghasilkan model regresi linier berganda dengan formulasi :

$$Y = 219,385 + 121,802X_1 + 71,049X_2 + 43,051X_3 + 92,187X_4 + 6,092X_5 + 81,626X_6 + 210,822X_7 + 120,528X_8.$$

Hasil pemodelan spasial potensi lahan menggunakan citra SPOT-4 dan analisis SIG dengan masukan nilai indeks kesesuaian jenis penggunaan lahan Model Fuzzy menghasilkan ketelitian rata-rata sebesar 0,81 (kategori tinggi), berarti nilai murni indeks kesesuaian jenis penggunaan lahan dapat digunakan untuk penentu potensi lahan, baik secara bersama-sama maupun sendiri-sendiri.

Model regresi linier berganda dapat digunakan untuk memprediksi tingkat potensi lahan berdasarkan jenis penggunaan lahan. Potensi lahan mencerminkan tingkat produktivitas lahan, sehingga dapat menentukan tingkat potensi lahan lebih tepat jika menggunakan parameter kesesuaian jenis penggunaan lahan. Potensi lahan lebih tepat menggunakan rumus : **potensi lahan \approx jenis penggunaan lahan**.

Hasil evaluasi pemodelan spasial potensi lahan ditemukan tiga jenis obyek penggunaan lahan perkebunan dalam satu kawasan, yaitu : coklat, kelapa, dan jambu mete, hal ini berarti kegiatan penggunaan lahan dalam satu kawasan potensi lahan dapat dimanfaatkan untuk tiga jenis komoditi tanaman perkebunan.

Kata Kunci : pemodelan spasial, potensi lahan, integrasi, citra SPOT-4, SIG, dan kepebisiran

ABSTRACT

INTEGRATION OF REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM FOR SPATIAL MODELLING OF COASTAL LAND POTENTIAL IN MUNA BARAT DISTRICT, SULAWESI TENGGARA

Spatial modeling of coastal land potential aims to design land potential use for planned function of areas. This study used surveys on the basis of interpreted SPOT-4 images recorded on October 12, 2012 and field surveys conducted between early February and the end of August 2013 which included 46 sample points. Testing the quality of spatial database was done prior to designing spatial database of coastal land potential. The test ensured that complied spatial database use in the spatial modeling of land potential achieved accuracy level by $\geq 80\%$. The integration of remote sensing and GIS with input of suitability index values of Fuzzy-Modeled land use type resulted in average precision value by 93.69%.

The study found that the integration of remote sensing of SPOT-4 images and GIS analysis with input of suitability index value of Fuzzy-modeled land use type resulted in spatial modeling of coastal land potential in Muna Barat District, which falls into six level categories of land potential i.e. (1) very high which covers 20045.32 hectares (22.13%); (2) high, spreading across 31193.05 hectares (34.43%); (3) medium which includes 21271.51 hectares (23.48%); (4) low with 23045.62 hectares (25.44%); (5) very low, covering 2001.10 hectares (2.21%) and (6) unproductive land which is 2024.80 ha (2.24%) in width. The last type of land refers to an area with the index value of land suitability ≤ 0 . Associated with water, no evaluation could be done to the index value of land suitability for any land uses. The spatial modeling of coastal land potential of Fuzzy-Modeled input resulted in a model of multiple linear regression formulated as follows:

$$Y = 219,385 + 121,802X_1 + 71,049X_2 + 43,051X_3 + 92,187X_4 + 6,092X_5 + 81,626X_6 + 210,822X_7 + 120,528X_8.$$

The spatial modeling of land potential which integrated SPOT-4 images and GIS analysis with input of suitability index value of Fuzzy-modeled land use type resulted in average precision level by 0.81 which was high in category. It suggests that the pure index value of land use suitability was compatible for determining land potential either jointly or independently.

To attain precise prediction on level of land potential by land use type, the multiple linear regression model was used. Potential land reflects the level of land productivity, therefore, it is possible to determine the level of land potential. However, using parameter of suitability type of land use will generate better output, which was formulated as follows: land potential \approx types of land use.

The evaluation of spatial modeling of land potential found three types of plantations within a region which were cacao, coconut and cashew. This indicates that the land is potential for three types of plantation crops.

Key words : spatial modeling, land potential, integration, SPOT-4 images, GIS, and coastal land.