Projection Of Land Cover Changes On Earthquake Disaster-Prone Areas, Bantul Regency Using Binary Logistic Regression And Cellular Automatic – Markov Chain

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ABSTRACT

Bantul Regency is an area affected by the development of Yogyakarta City which causes the dynamics of land cover changes and is an earthquake-prone area. Land cover changes can be modeled and projected with geographic information systems (GIS). This study examines (1) Typology of the vulnerability of the Bantul Regency earthquake disaster in 2021 and 2036; (2) changes in land cover of Bantul Regency in 1991, 2006 and 2021; (3) projections and factors for changes in land cover of Bantul Regency in 2036 with binary logistics regression- Cellular Automata Markov Chain (CA-Markov Chain) (4) conformity of utilization and space utilization directives based on earthquake disaster mitigation. Research methods used: (1) spatial analysis methods of processing and image classification; (2) land cover projection method with Cellular Automata – Markov Chain (CA-Markov); (3) binary logistics regrersi analysis methods of land cover change factors; (4) methods of scoring and weighting earthquake insecurity classification; (5) qualitative descriptive analysis methods of conformity and space utilization directives based on earthquake disaster mitigation. Bantul Regency earthquake insecurity typology is dominated by high insecurity class typology (E) and very high insecurity typology (F) in Banguntapan and Pleret Districts, Land cover change built in Bantul tahun Regency 1991 - 2021 is 75.01 km^2. The projected change in land cover with Cellular Automata – Markov Chain (CA-Markov) in Bantul Regency in 2036 is a built-up land area of 157.37 km^2 and an undeveloped land area of 364.24 km^2 with the dominant factor is the distance to rivers and health facilities. The projected growth of Bantul Regency land acquisition in 2036 indicated a deviation of 47% (245.98 km^2). The direction of space utilization based on earthquake disaster mitigation in Bantul Regency is 69.32% of the space utilization is allowed and 30.68% of the space utilization is not allowed.

***Keywords** : Land Cover, Tectonic Earthquakes, Bantul Regency, Binary Logistic Regression, Cellular Automata-Markov Chain*

PROYEKSI PERUBAHAN TUTUPAN LAHAN DI KAWASAN RAWAN BENCANA GEMPA KABUPATEN BANTUL MENGGUNAKAN REGRESI LOGISTIK BINER DAN *CELLULAR AUTOMATA – MARKOV CHAIN*

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INTISARI

Kabupaten Bantul merupakan wilayah terdampak perkembangan Kota Yogyakarta yang menyebabkan dinamika perubahan tutupan lahan serta merupakan wilayah rawan gempa bumi. Perubahan tutupan lahan dapat dimodelkan dan diproyeksikan dengan sistem informasi geografis (SIG). Penelitian ini mengkaji (1) Tipologi kerawanan bencana gempa bumi Kabupaten Bantul tahun 2021 dan 2036; (2) perubahan tutupan lahan Kabupaten Bantul tahun 1991, 2006 dan 2021; (3) proyeksi dan faktor perubahan tutupan lahan Kabupaten Bantul tahun 2036 dengan regresi logistik biner- *Cellular Automata Markov Chain* (*CA-Markov Chain)* (4) kesesuaian pemanfaatan dan arahan pemanfaatan ruang berbasis mitigasi bencana gempa bumi.Metode penelitian yang digunakan: (1) metode analisis spasial pengolahan dan klasifikasi citra; (2) metode proyeksi tutupan lahan dengan *Cellular Automata – Markov Chain* (CA-Markov); (3) metode analisis regrersi logistik biner faktor perubahan tutupan lahan; (4) metode skoring dan pembobotan klasifikasi kerawanan gempa bumi; (5) metode analisis deksriptif kualitatif kesesuaian dan arahan pemanfaatan ruang berbasis mitigasi bencana gempa bumi. Tipologi kerawanan gempa bumi Kabupaten Bantul didominasi tipologi kelas kerawanan tinggi (E) dan Tipologi kerawanan sangat tinggi (F) di Kecamatan Banguntapan dan Pleret, Perubahan tutupan lahan terbangun di Kabupaten Bantul tahun 1991 - tahun 2021 adalah sebesar 75.01 km^2. Proyeksi perubahan tutupan lahan dengan *Cellular Automata – Markov Chain* (CA-Markov) di Kabupaten Bantul tahun 2036 adalah lahan terbangun seluas 157.37 km^2 dan lahan tidak terbangun seluas 364.24 km^2 dengan faktor yang dominan adalah jarak terhadap sungai dan sarana kesehatan. Proyeksi pertumbuhan tutupan lahan Kabupaten Bantul tahun 2036 terindikasi penyimpangan 47% (245.98 km^2). Arahan pemanfaatan ruang berbasis mitigasi bencana gempa bumi Kabupaten Bantul adalah 69,32% pemanfaatan ruangnya diperbolehkan dan 30,68% pemanfaatan ruangnya tidak diperbolehkan.

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***Kata Kunci** : Tutupan Lahan, Gempa Bumi Tektonik, Kabupaten Bantul, Regresi Logistik Biner, Cellular Automata-Markov Chain*