

Landslide Mitigation and Land Cover Conforming Directions with Spatial Planning Based on Agricultural Functions in Bogor Regency

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Background

- Bogor Regency known as the region with the most frequent landslide events [1].
- Bogor Regency Government has established a Spatial Plan for 2024–2044 minimize landslide susceptibility.
- The inconsistency and lack of safety of the spatial plan against landslides in Bogor Regency require mitigation guidelines and land cover adjustment to support landslide resilience.

"The objectives are to map and provide direction strategies for addressing spatial plan non-conformity and unsafe areas in Bogor Regency."

Result and Discussion

Methodology

Tools: QGIS, R Studio

Spatial Plan Conformity Map



Data used: Landslide (2367 location) & non-landslide (2367 location) coordinate, slope, NDVI, annual rainfall, land cover, soil texture, distance to river and fault, Public Work Ministry Regulation [2], and Bogor Regency Government Regulation [3]

Random Forest-based Landslide Susceptibility Class Map

Landslide Safety Spatial Plan Map

Landslide Mitigation Priority Map

Direction for Landslide Mitigation and Land Cover Adjustment

Fig 1. Research flowchart

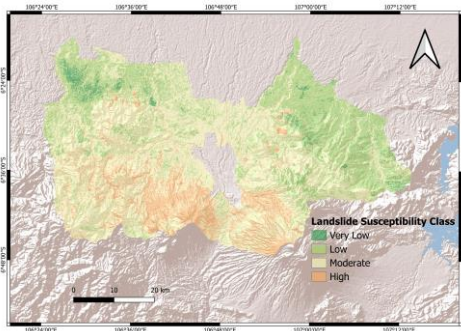


Fig 2. Random Forest Landslide susceptibility class map

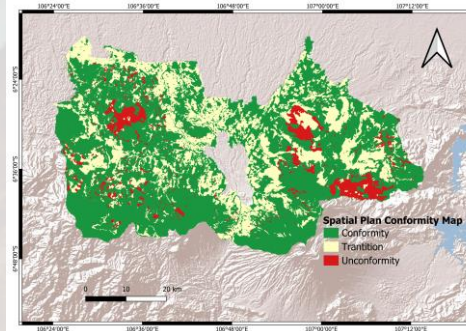


Fig 3. Conformity spatial plan

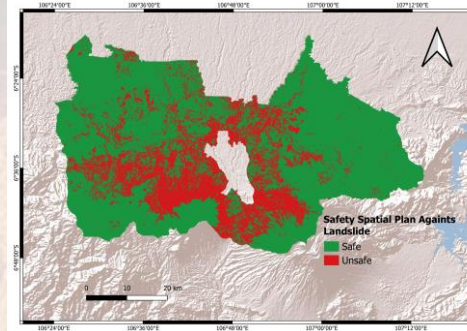


Fig 4. Landslide safety spatial plan map

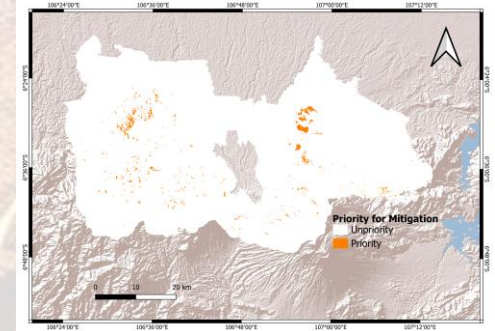


Fig 5. Landslide mitigation priority map (non-conformity $\cap$ unsafety spatial plan)

Direction Strategy in non-conformity spatial plan: Tea and oil palm plantation in forestry production zones

Expansion restrictions



Soil conservation practices



Planting of strong rooted understories, and agroforestry practices or trees between commodities

Direction Strategy in non-conformity spatial plan: Mining in horticulture and food crop zones

Expansion restrictions



Reclamation



Land Rehabilitation



Preparation and planting of commodities appropriate to the zone function

- Non-conformity $\cap$ unsafety spatial plan = 2,127.35 hectares
- The non-conformity between land cover and spatial planning in landslide-unsafe areas may accelerate environmental degradation and raise disaster susceptibility [4].

[1] <https://opendata.jabarprov.go.id/id/dataset/jumlah-kejadian-bencana-tanah-longsor-berdasarkan-kabupatenkota-di-jawa-barat>

[2] <https://peraturan.bpk.go.id/Details/285884/permen-pupr-no-22-tahun-2007>

[3] <https://peraturan.bpk.go.id/Details/300691/perda-kab-bogor-no-1-tahun-2024>

[4] <https://doi.org/10.20961/region.v19i1.66891>