# MODEL TANAMAN KEBUN AGROFORESTRI PADA LAHAN BEKAS LONGSOR DI SUB DAS KALIWUNGU KABUPATEN MAGELANG

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## ABSTRAK

Studi tentang model pengaturan letak tanaman berdasarkan morfologi lahan dan stabilitas lereng telah banyak dilakukan. Pengaturan tata letak tanaman berdasarkan tatanan lereng hasil proses longsor masih terbatas diteliti. Longsor yang terjadi di masa lalu dapat mengalami reaktivasi. Tujuan penelitian ini adalah mengatur letak tanaman kebun agroforestri berdasarkan tatanan lereng hasil longsor serta proses geomorfologi permukaan untuk mencegah reaktivasi longsor.

Penelitian diawali dengan pengukuran morfometri lereng hasil longsor, proses geomorfologi serta kondisi tanaman utama berbasis interpretasi visual dan digital citra *orthopotho UAV, DSM* dan *DTM.* Foto udara dari *UAV* diolah menjadi *orthophoto* dengan menggunakan beberapa titik kontrol yang diperoleh melalui pengukuran *GPS geodetic*. *Orthophoto* kemudian diolah menjadi *DSM* dan *DTM*. Kegiatan inventarisasi jenis dan kondisi tanaman yang ada di daerah penelitian diidentifikasi melalui interpretasi *orthophoto* secara manual. Delineasi satuan-satuan lereng dilakukan secara manual pada visualisasi karakteristik lereng yang diturunkan dari *DTM* secara otomatis. Proses geomorfologi yang terjadi diidentifikasi secara visual dari *orthophoto* yang dilengkapi dengan identifikasi lapangan. Analisis korelasi spasial antara morfometri lereng hasil longsor, variasi tipe dan ukuran proses geomorfologi serta penggunaan lahan aktual dilakukan dengan metode kuantitatif deskriptif. Rekomendasi pemilihan dan pengaturan letak tanaman dilakukan berdasarkan morfometri zona lereng, proses geomorfologi dan variabel morfologi tanaman.

Tatanan morfologi bekas longsor secara global tersusun atas 3 zona yaitu zona sisa, zona pengikisan, dan zona pengendapan. Tatanan morfologi bekas longsor merupakan cerminan dari tatanan proses-proses geomorfologis yang saat ini berlangsung. Tatanan morfologi bekas longsor dapat dimanfaatkan sebagai satuan-satuan persebaran tanaman untuk pengendalian proses reaktivasi longsor. Tanaman yang ada di daerah penelitian telah lengkap variasinya yang mencakup tanaman berakar dalam hingga berakar dangkal, serta tipe tajuk sebagai penutup permukaan tanah dari tetes hujan. Jenis-jenis tanaman yang ada di daerah penelitian dapat ditata kembali menurut tatanan morfologi agar lebih efektif dalam menurunkan potensi terjadinya proses reaktivasi longsor di masa yang akan datang.

Kata kunci: morfologi, longsor, tanaman, agroforestri, reaktivasi

# *MODEL OF AGROFORESTRY GARDEN PLANTS IN FORMER LANDSLIDE AREA KALIWUNGU WATERSHED MAGELANG DISTRICT*

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## *ABSTRACT*

*Plants spatial arrangement model based on physical morphology and slope stability have been widely studied. Study on plants spatial arrangement based on landslide slope zones are still limited. Former landslide can be reactivated. This study aimed to manage the vegetation in agroforestry system based on landslide slope zones as well as surface geomorphological processes to control landslide reactivation.*

*The research process started with measurement of landslide slope zones morphometry, geomorphological processes and actual land use condition through visual and digital interpretation of UAV orthophoto image, DSM and DTM. The UAV aerial photograph is processed to generate orthophoto imagery by using ground control point resulted from geodetic GPS measurement. Inventory of type vegetation along with its physical condition were identified through manual interpretation of orthophoto image. Slope zones delineation was done manually through visualization of slope characteristic that automatically derived from DTM. Geomorphological processes that have been visually identified from orthophoto image was equipped by field survey. Spatial correlation analysis between landslide slope morphometry, typology variations and geomorphological processes size as well as actual land use were described by descriptive quantitative method. Recommendation of plants determination and spatial arrangement were conducted based on slope zones morphometry, geomorphological processes and plants morphology variable.*

*Morphological structure of former landslide is composed of three zones that are residual zone, depletional zone and depositional zone. Morphological structure of past landslide is a depiction of the occurring geomorphological processes. Morphological structure of past landslide can be used as a unit reference of plants distribution to control landslide reactivation. Existing plants in study area have complete variations including deep rooted plants and shallow rooted plants with many canopy cover to protect surface land from rain throughfall. Types of plants in study area can be arranged based on morphological structure of slope to prevent future landslide reactivation.*

*Key words: morphology, landslide, plants, agroforestry, reactivation*