

**TEKNIK PENGENDALIAN GERAKAN MASSA TANAH
DI DUSUN NGLANGGERAN KULON, KALURAHAN NGLANGGERAN,
KAPANEWON PATUK, KABUPATEN GUNUNGKIDUL,
DAERAH ISTIMEWA YOGYAKARTA**

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INTISARI

Terjadinya siklon tropis Cempaka di Indonesia berdampak pada beberapa wilayah Indonesia, salah satunya terjadi di Dusun Nglanggeran Kulon, Kalurahan Nglanggeran, Kapanewon Patuk, Kabupaten Gunungkidul, DIY pada November 2017 yaitu gerakan massa tanah. Bencana tersebut menyebabkan rusaknya kebun campuran, tertutupnya akses jalan lokal serta rubuhnya kandang ternak penduduk. Penelitian ini bertujuan untuk mengidentifikasi karakteristik gerakan massa tanah di daerah penelitian, menganalisis kerawanan daerah penelitian berdasarkan faktor keamanan lereng, dan merekomendasikan arah pengelolaan lereng dengan beberapa pendekatan sesuai dengan kondisi daerah penelitian.

Penelitian dilakukan dengan dua metode yaitu metode pengumpulan data dan metode analisis data. Pengumpulan data dilakukan dengan survei dan pemetaan, pengambilan sampel sampel tanah dengan metode *purposive sampling* pada bagian mahkota gerakan massa tanah, serta dokumentasi lapangan sebagai bahan pendukung pembuatan laporan. Analisis data dilakukan menggunakan perangkat lunak *Slide 6.0* dengan analisis faktor keamanan dengan metode Bishop yang disederhanakan berdasarkan hasil uji sifat fisik dan mekanik tanah, serta analisis karakteristik gerakan massa tanah dengan metode deskriptif.

Hasil penelitian menunjukkan karakteristik gerakan massa tanah yang terjadi di daerah penelitian merupakan *Debris Slide* yang bergerak ke arah barat mengikuti arah kemiringan lereng dengan bidang gelincir berbentuk cekung berupa batuan andesit masih menyisakan tubuh hingga kaki dengan kemiringan curam 32° dan *mainscrap* sangat terjal (60°) setinggi 9 m. Gerakan massa tanah tersebut dipicu oleh anomali cuaca yang menyebabkan turunnya hujan dengan intensitas mencapai 277,6 mm/hari pada tanggal 28 November 2017 dan juga adanya pembebanan pada lereng oleh bongkah batuan beku. Daerah penelitian tersebut masuk ke dalam daerah dengan kerawanan gerakan massa tanah tinggi dengan nilai faktor keamanan lereng 1,143 dengan memasukkan faktor pembebanan lereng statis sebesar 100 kN dan muka air tanah jenuh. Setelah dilakukan rekayasa berupa perubahan geometri lereng dengan menambahkan teras pada lereng nilai faktor keamanan menjadi naik menjadi 1,336 dan tingkat kerawanannya turun menjadi menengah. Arahan pengelolaan lereng terdiri dari perbaikan geometri lereng, pembuatan saluran drainase pada teras lereng dan jalan local, rekayasa vegetatif dengan penanaman rumput akar wangi sebagai pencegah erosi dan pohon pisang sebagai sumber penunjang ekonomi warga, pendekatan sosial melalui peran serta masyarakat, serta pendekatan institusi. Penelitian ini diharapkan dapat menjadi salah satu rekomendasi pengelolaan lereng di daerah penelitian.

Kata Kunci: Gerakan Massa Tanah, Teknik Pengendalian Gerakan Massa Tanah, Pengelolaan Lereng.

**SOIL MASS MOVEMENTS CONTROL TECHNIQUES
IN NGLANGGERAN KULON, NGLANGGERAN VILLAGE, PATUK
DISTRICT, GUNUNGKIDUL REGENCY, YOGYAKARTA SPECIAL REGION**

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ABSTRACT

The occurrence of tropical cyclone Cempaka in Indonesia has an impact on several parts of Indonesia, one of which occurred in Nglanggeran Kulon Hamlet, Nglanggeran Village, Kapanewon Patuk, Gunungkidul Regency, DIY in November 2017, namely the movement of land masses. The disaster caused the destruction of mixed gardens, closed access to local roads and the collapse of people's livestock cages. This study aims to identify the characteristics of soil mass movement in the study area, analyze the vulnerability of the study area based on the slope safety factor, and recommend the direction of slope management with several approaches according to the conditions of the study area.

The research was conducted using two methods, namely data collection methods and data analysis methods. Data collection was carried out by surveying and mapping, taking soil samples using purposive sampling method on the crown of the soil mass movement, as well as field documentation as supporting material for making reports. Data analysis was performed using Slide 6.0 software with analysis of the safety factor using the simplified Bishop method based on the results of physical and mechanical properties of the soil, as well as analysis of the characteristics of soil mass movements using descriptive methods.

The results showed that the characteristics of the soil mass movement that occurred in the study area were Debris Slide which moved westward following the direction of the slope with a concave slip plane in the form of andesite rocks still leaving the body up to the foot with a steep slope of 32° and very steep mainscrap (60°) as high as 9 m. The ground mass movement was triggered by weather anomalies that caused rain with an intensity of up to 277.6 mm/day on November 28, 2017 and also the loading on the slopes by chunks of igneous rock. The research area is included in an area with high soil mass movement susceptibility with a slope safety factor value of 1.143 by including a static slope loading factor of 100 kN and a saturated ground water level. After engineering changes in the geometry of the slopes by adding terraces on the slopes, the value of the safety factor increases to 1.336 and the level of vulnerability decreases to medium. The directions for slope management consist of improving slope geometry, constructing drainage channels on slope terraces and local roads, vegetative engineering by planting vetiver grass as a prevention of erosion and banana trees as a source of economic support for residents, social approaches through community participation, and institutional approaches. This research is expected to be one of the recommendations for slope management in the research area.

Keywords: Soil Mass Movement, Soil Mass Movement Control Techniques, Slope Management.