

INTISARI

Merapi yang dikategorikan sebagai salah satu gunung teraktif di dunia sudah banyak diteliti dari aspek geologi, geomorfologi dan sosialnya. Namun kajian dampak positif erupsi merapi 2010 terhadap sifat fisik, kimia, mineralogi dan kualitas lahan belum banyak diteliti. Oleh karena itu penelitian ini bertujuan mengkaji: 1) Sebaran, komposisi mineral primer dan potensi kandungan hara makro-mikro dalam material vulkanik; 2) Tingkat kesuburan tanah dan produktivitas biomassa; dan 3) Modifikasi kriteria kesesuaian lahan FAO spesifik kawasan gunung aktif. Penelitian ini dilakukan di lereng selatan Merapi dengan menggunakan metode *purposive sampling*. Kawasan studi dipilahkan menjadi 4 satuan geomorfologi yang diperoleh dari hasil interpretasi peta dasar dan analisis lanskap, yaitu: lereng atas, lereng tengah, lereng bawah, dan lereng kaki. Peta sebaran material vulkanik dibuat berdasarkan 102 sampel minipit, sedangkan sampel material vulkanik dan tanah diambil dari masing-masing lapisan/horison dari 20 profil perwakilan. Pengamatan lapangan meliputi deskripsi tapak, profil dan pengukuran biomassa. Analisis sampel tanah meliputi sifat fisik, kimia dan mineralogi. Potensi hara dihitung dengan persamaan $P = L \times k \times BV \times h$ (ton/ha), dimana, P = potensi hara (ton/ha), L = luas area (Ha), k = ketebalan tanah (m), BV = berat volume (g/cm^3), dan h = kadar hara dalam tanah (%). Hasil penelitian menunjukkan bahwa sebaran material vulkanik dipengaruhi oleh proses jatuhnya dan bentuk geomorfologi lahannya. Komposisi dan kandungan mineral primer mudah lapuk dalam material vulkanik yaitu plagioklas>piroksin>hornblende. Potensi hara dalam tanah diperoleh urutan $Fe > Ca > P > Mg > K > Na > Zn$, sedangkan bentuk tersedianya $P > Ca > Na > K > Mg$. Berdasarkan produktivitas biomasnya, tingkat kesuburan tanah pada satuan geomorfologi lereng kaki (2.877,26 ton/ha) > lereng atas (1.245,78 ton/ha) > lereng tengah (237,95 ton/ha) > lereng bawah (133,36 ton/ha). Kesesuaian lahan lereng selatan Merapi untuk tanaman tahunan dan pangan dengan kriteria FAO sebagian besar tergolong kelas N1 (tidak sesuai untuk saat ini) dengan faktor pembatas kemiringan lahan, ketinggian tempat, tekstur tanah, batuan permukaan, dan kesuburan tanah. Setelah dilakukan modifikasi terhadap kriteria tersebut dan menambahkan kandungan mineral mudah lapuk sebagai kriteria baru maka diperoleh peningkatan kelas sampai S2 - S3 (sesuai dengan syarat).

Kata Kunci: potensi hara, mineral mudah lapuk, hara makro-mikro, kriteria kesesuaian lahan termodifikasi.

ABSTRACT

Merapi is categorized as one of the most active volcanoes in the world has been widely researched from geological, geomorphological and social aspects. However, the study of the positive impact of Merapi eruption 2010 on the physical, chemical, mineralogy and land quality has not been studied. Therefore, the study was to find out: 1) distribution, primary mineral composition and the potential of macro-micro nutrient content in volcanic materials; 2) Soil fertility status and biomass productivity; and 3) Modification of FAO land suitability criteria for specific active mountain areas. This research was conducted on the Mt. Merapi southern flank by applying the purposive sampling method. The study area was divided into 4 geomorphological units obtained from the interpretation of thematic maps and landscape analysis, ie: upper slopes, middle slopes, lower slopes, and foot slopes. The volcanic material distribution map was made based on 103 minipit samples, while volcanic material and soil samples were taken from each layer/horizon of 20 representative profiles. Field observations include site and profile description, and biomass measurements. Soil samples analysis was subjected for physical, chemical and mineralogical properties. The nutrient potential was calculated by the equation of $P = L \times k \times BD \times h$ (ton/ha), where, P = nutritional potency value of volcanic material for each nutrient (ton/ha), L = area (Ha), k = the thickness of the surface material and soil (m), BD = bulk density of the surface material and soil (g/cm³), and h = nutrient concentration in the surface material and soil (%). The results revealed that the distribution of volcanic material was influenced by the falling process and land geomorphology shape. Composition and weatherable primary mineral content in volcanic material that was plagioclase > pyroxene > hornblende. The nutrient potential in the soil was obtained in order of Fe > Ca > P > Mg > K > Na > Zn, while the available form was P > Ca > Na > K > Mg. Based on the biomass productivity, soil fertility level in geomorphological unit of the foot slope (2,877.26 ton / ha) > upper slope (1245.78 ton / ha) > middle slope (237.95 ton / ha) > lower slope (133.36 ton / Ha). The suitability of the Mt. Merapi southern slopes for annual and perenial crops with the FAO criteria was mainly classified as N1 (currently unsuitable) with limiting factors of land slope, altitude, soil texture, surface rock, and soil fertility. After modification of these criteria and adding the weatherable mineral content as a new criterion it is obtained by increasing the class until S2 - S3 (moderate suitable).

Keywords: nutrient potential, weatherable minerals, macro-micro nutrients, modified land suitability criteria.