GEOLOGI DAN KARAKTERISTIK ENDAPAN PASIR ZONA SUNGAI OPAK, *FORESHORE* DAN GUMUK PASIR PARANGTRITIS SERTA USULAN PENGEMBANGAN KAWASAN KONSERVASI GUMUK PASIR DAERAH ISTIMEWA YOGYAKARTA

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Daerah telitian dibagi menjadi 2 zona, yaitu zona Parangtiritis dan Zona Opak. Zona Parangtritis secara administratif berada di 3 wilayah kecamatan dan 2 kabupaten meliputi Kecamatan Kretek dan Kecamatan Pundong yang berada di wilayah Kabupaten Bantul dan Kecamatan Purwosari yang berada di wilayah Kabupaten Gunungkidul. Secara geografis, daerah telitian terletak pada koordinat 420500 mE – 428000 mE dan 9112000 mN – 9117500 mN (UTM WGS 41984 zona 49S). Luas daerah telitian ± 30,75 km^2 dengan skala peta 1: 20000. Kemudian zona Sungai Opak meliputi bagian hulu di lereng atas Gunung Merapi sampai daerah hilir di muara Pantai Depok dengan panjang sungai ± 65 km yang secara administratif melintasi Kabupaten Sleman dan Kabupaten Bantul.

Geomorfologi daerah telitian dibagi menjadi 7 bentukasal, yaitu (a) vulaknik, dengan bentuklahan dataran fluvio-vulkanik (V1), (b) struktural, dengan bentuklahan gawir garis sesar (S1), (c) karst, dengan bentuklahan lereng dan perbukitan karstik terkikis (K1), (d) aeolian, dengan bentuklahan gumuk pasir (A1), (e) fluvial, dengan bentuklahan tubuh sungai (F1) dan dataran limpah banjir (F2), (f) marin, dengan bentuklahan dataran pantai (M1) serta tebing terjal dan takik pantai (M2), dan (g) denudasional, dengan bentuklahan bukit sisa (D1).

Stratigrafi daerah telitian dibagi ke dalam enam satuan litostratigrafi tidak resmi dan 1 intrusi dari tua ke muda, yaitu satuan lava andesit Nglanggran (Miosen Awal-Miosen Tengah), satuan breksi andesit Nglanggran (Miosen Awal-Miosen Tengah), satuan lava basalt Nglanggran (Miosen Awal-Tengah), intrusi andesit (Miosen Awal-Tengah), satuan batugamping Wonosari (N9-N18, Miosen Tengah-Miosen Akhir), endapan Gunung Merapi (Kuarter), serta endapan pantai dan gumuk pasir (Kuarter).

Hasil analisis sampel Sungai Opak menunjukkan kelas ukuran butir didominasi *coarse sand*, sortasi buruk, kelas *skewness symmetrical-very fine skewed* dan kelas kurtosis *platykurtic-mesokurtic*. Sampel *foreshore* didominasi kelas butir *fine sand*, sortasi sedang-baik, kelas *skewness very coarse skewed* dan kelas kurtosis *mesokurtic-leptokurtic*. Sampel gumuk pasir didominasi kelas butir *fine sand*, sortasi agak baik, kelas *skewness symmetrical* dan kelas kurtosis *mesokurtic-leptokurtic*. Mekanisme sedimentasi traksi dominan di sepanjang aliran Sungai Opak, suspensi dominan di *foreshore* dan saltasi dominan pada zona gumuk pasir. Analisis morfologi butir menunjukkan bentuk butir semakin membola dan derajat kebundaran semakin baik berurutan dari zona Sungai Opak, *foreshore* dan gumuk pasir. Berdasarkan interpretasi *provenance*, didapatkan nama sedimen pasir Sungai Opak dan gumuk pasir adalah *arkose* dan jika nantinya terlitifikasi maka disebut *arkosic arenite*. Kemudian sumber material Sungai Opak terbentuk pada iklim tropis sedang-tropis lembab dengan relief pegunungan dan sumber detrital gumuk pasir terbentuk pada iklim iklim tropis sedang-tropis lembab dengan relief perbukitan. Tipe *provenance* utama sampel Sungai Opak dan gumuk pasir adalah busur magmatik dimana sumber material sedimen di ketiga zona tersebut berasal dari material hasil erupsi Gunung Merapi, material dari formasi yang dilalui sepanjang aliran dari Sungai Opak dan material yang berasal dari Sungai Oyo. Kawasan Gumuk Pasir Parangtritis merupakan kawasan konservasi yang berpotensi untuk dikembangkan menjadi *science park* dan lebih jauh menjadi bagian dari *Geopark* Merapi.

GEOLOGY AND SAND-DEPOSITS CHARACTERISTICS IN OPAK RIVER, FORESHORE AND SAND DUNE ZONE AND RECOMMENDATION OF SAND DUNE CONSERVATION AREA DEVELOPMENT IN SPECIAL REGION OF YOGYAKARTA

ABSTRACT

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The research area was divided into 2 main zones, namely Parangtritis zone and Opak River zone. Parangtritis zone administratively is located in 3 sub-district areas and 2 regency, Kretek and Pundong belongs to Bantul regency and Purwosari belongs to Gunungkidul regency. The research area geographically is located at 420500 mE – 428000 mE dan 9112000 mN – 9117500 mN (UTM WGS 41984 49S zone). The Opak zone covering upstream on the upper slopes of Merapi Volcaano until the downstream located around Depok beach with full-length of river approximately 65 km which is crossing Sleman and Bantul regency.

Geomorphology in the research area was divided into seven landforms, there are (a) volcanic, named fluvio-volcanic plain landscape (V1), (b) structural, named line-fault escarpment landscape, (c) karst, named eroded slope and karstic hills landscape, (d) aeolian, named sand dune landscape, (e) fluvial, with river and floodplain landscape, (f) marine, with coastal plain and coastal cliff and notch landscape (g) denudational, named residual hills landscape.

Stratigraphy in the research area was divided into six units lithostratigraphy and one intrusion from young to old, there are Nglanggran andesite-lava units (Early Miocene-Middle Miocene), Nglanggran andesite-breccia units (Early Miocene-Middle Miocene), Nglanggran basalt-lava units ((Early Miocene-Middle Miocene), andesite intrusion (Early Miocene-Middle Miocene), Wonosari-limetone units (N9-N18, Middle Miocene-Late Miocene), Merapi deposits units (Quartenary), coastal and sand dune deposits units (Quartenary).

The results of the Opak River samples analysis showed grain size classes dominated by coarse sand, poor sorting, symmetrical-very fine skewed and platykurtic-mesokurtic of kurtosis classes. Foreshore samples were dominated by fine sand, moderately well sorting, very skewed skewness class and mesokurtic-leptokurtic of kurtosis classes. Sand dune samples were dominated by fine sand, moderately well sorting, symmetrical skewness class and mesokurtic-leptokurtic of kurtosis classes. Traction sedimentation dominant along the Opak River zone, suspension sedimentation dominant in the foreshore zone and saltation dominant in the sand dunes zone. Grain morphology analysis concluded that grain shape tends to be more spheris and well-rounded consecutive from Opak River, foreshore and sand dune. Based on composition of sediment particles analysis, it was obtained that the sand name of Opak River and sand dune zones is arkose sand and then called arkosic arenite if litification process occurs. The Opak River materials sources are formed in a subhumid-tropical humid climate with high relief (mountains) and sand dune materials sources are formed in temperate subhumid-tropical humid climate with hills-plain relief. The main provenance type of the Opak River and the sand dune samples are magmatic arc wherein the source of the sedimentary material in the three zones are derived from the erupted material of Merapi Volcano, the formation traversed along the stream of the Opak River and Oyo River materials.