PROCEEDINGS

Regional Geoheritage Conference 2016

THE 9TH INDONESIA-MALAYSIA CONFERENCE

ISBN: 978-602-8461-28-3

" Exotic Past For Our Future "

HYATT REGENCY HOTEL- YOGYAKARTA

24-25 NOVEMBER 2016

UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" YOGYAKARTA

UNIVERSITI KEBANGSAAN MALAYSIA

United Nations Educational, Scientific and Cultural Organization

BADAN GEOLOGI KEMENTRIAN ENERGI SUMBER DAYA MINERAL

DEPARTEMENT OF MINERAL RESOURCES THAILAND

Proceedings

Regional Geoheritage Conference 2016

The 9Th Indonesia-Malaysia Conference

"Exotic Past for our Future"

Seminar Held on 24 November 2016
In Hotel Hyatt Regency Yogyakata, Indonesia

Field Trip Held on 25 November 2016

Proceedings

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FACULTY OF MINERAL TECHNOLOGY
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN'
YOGYAKARTA
2016

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Preface

Bismilahirrahmanirrahim, Assalamu'alaikum wa rahmatulahi wa barokatuh.

Dear distinguished participants and committee.

In this nice opportunity, I appreciate to all of you for your considerable effort that made the Regional Geoheritage Conference 2016 or the 9th Joint Conference Indonesia – Malaysia Geoheritage Conference happened.

I really thankful to your participations for joining and attending the Conference in Yogyakarta. Special Region of Yogyakarta is well known as education and cultural city. Yogyakarta also become a considerable touristic region especially in cultural heritage. Right now geoheritage in Yogyakarta become more attractive.

In this occasion, the conference is very simple. Conference will be held over two days. First day we will held conference and geotrack in the second day.

There is two main speakers for RGC 2016. The first speaker is Mr. Ibrahim Komoo as Vice President Global Geoparks Network (GGN) and Mr. Yunus Kusumahbrata as Expert Staf Ministry of Energy and Mineral Resources of Indonesia Republic. For the next season, we also have speakers from Thailand and two speakers from Gunungsewu UGG and Batur UGG Indonesia. Moreover, we have 30 outstanding papers that will be presented in this conference. The papers are consist in 12 oral papers and 23 posters presentation with the same value.

In geotrack we will discover several geoheritage sites in Gunungsewu UGG, such as Miocene pillow lava of Berbah; ancient volcanic product of Nglanggeran; exciting bioturbation within shallow marine Sambipitu Formation; and Karst Museum of Indonesia at Wonogiri.

I wish this conference will give us inspirations and enhance the cooperation in Southeast Asia countries, especially in the field of geoheritage. Happy sharing for the progress of our region.

Finally, I would like to express my gratitude to Geological Agency – Ministry of Mineral Resources, especially Center of Geological Survey performa a booth concerning the wonderful of geoheritage and geopark of Indonesia.

Wassalamu'alaikum wa rahmatulahi wa barokatuh.

Prof. Dr. Ir.Bambang Prastistho, M.Sc.
Chairman
Regional Geoheritage Conference 2016

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GEODIVERSITY OF LANDSCAPE PAPUMA BEACH, JEMBER, EAST JAVA

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ABSTRACT

Geodiversity forms the landscape in the region Papuma Beach (Jember) has a diverse landscape forms. The landscape of unique Papuma Beach area designed to set as geoheritage region. Determination of which will be accompanied by the sale is expected to be improve the quality of the community's economy around Papuma Beach. Aim this study is the inventory geotapak-geotapak (geosites) which potentially and useful in the field of science and tourism which will then be projected to be geopark. The method used in achieving this goal is to do geological mapping and morphological landscape Papuma beach neighborhood, conduct geological analysis related to the genesis of a unique landscape. Papuma beach region consists of two lithologies that Sukamade and Puger Formations. Forms of poles that are found in coastal areas this part of Sukamade Formation consisting calcareous sandstones , breccias, and limestones tuffaceous, form a perforated texture on a calcareous sandstones as a result of the dissolution process . Shape unique landscape on the Papuma beach include landscapes shaped like a pole and frog annimals.

INTRODUCTION

Beach Papuma located south of the city of Jember, East Java, distance from the town of Jember 45 km can be reached by vehicle for 1 hour, administratively beach Papuma located in the village Lojejer, Wuluhan Districs, Jember, the position coordinates of 8^0 25 '48 "and 113^0 33 '13 ". (Figure 1.)

Indonesia is known as a country with beautiful landscapes. But this time Natural Resource quality declines as utilization is not well structured.

Therefore, there should be a structured preservation and the need for a breakthrough to develop the Natural Resources.

Geopark is a nationally protected area, has several sites geoheritage important, rare, and have aesthetic value (Leman et al, 2006). Papuma beach is one of the beaches located in Jember, East Java Province potential as geoheritage region, even potentially to be projected as a geopark.

Visually, the landscape morphology Papuma Coast region is one of the best in the island of Java . The process of formation (geological) need to be studied as an important information for travel enthusiasts.

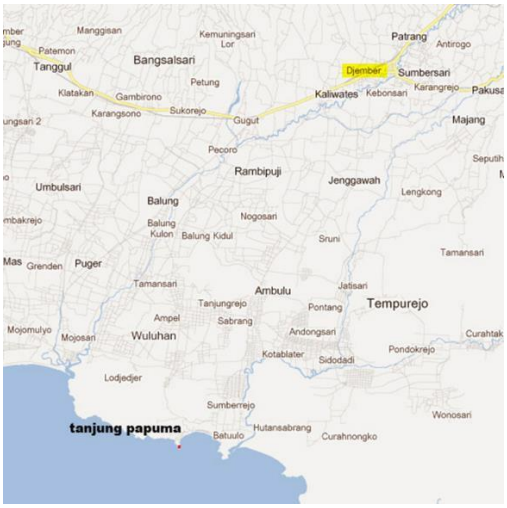

Figure 1. Position Papuma coast of the town of Jember

1. Geology

Regional tectonic framework carefully situations and Java in general is very closely related to the period of the end (Post-) volcanic Oligocene-Miocene,it known as OAF (Old Andesite Formation) by experts of geoscience. It is characterized by carbonate rocks srdimentary in the marine environment, it is found in many places on the island of Java, one of them around the area of the research sites.Stratigraphy in the study area include (Figure 2).

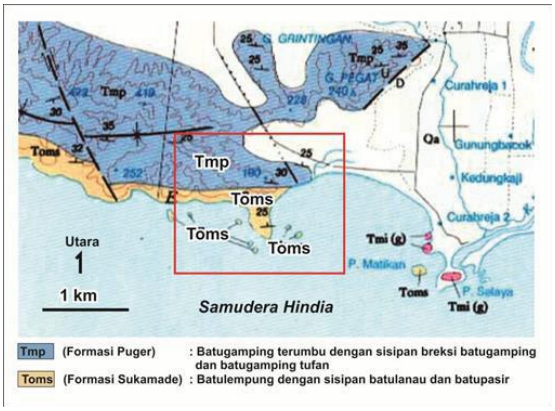

Figure 2. Geological map of Papuma beach

2.1. Sukamade Formation

Sukamade Formation have composed sandstones an insert of siltstone and mudstone. These rock units are generally greenish gray, very hard and quilted bedding well. Thickness average of 30 cm. sedimentary structures that are found are aligned laminate, cross bedding laminate , konvolut laminate , greded bedding and some fine massif. Clastic rocks contain many fossils, including Globorotalia periperhoda, Globorotalia mayeri, Globorotalia peripheroacuta which shows age the bottom middle Miocene (N10-N12) .Formasi is deposited on the marine environment of the slope to the seabed and interfingering with volcanic rocks Merubetiri formations . The basic of interfingering the age of Sukamade Formation allegedly late Oligocene - early middle Miocene. It is spreading around the mountain Jagatamu and Alit in the southeast corner of the map

sheet, the thickness of approximately 400 m, the best outcrops are along the Sukamade river.

2.2. Igneous rocks

Igneous rocks contained in Jember and surrounding areas in the form of granodiorite, diorite and dacite the Middle Miocene age.

2.3. Puger Formation

Puger formation consists of a reef limestones insert breccia limestones and tuffaceuos limestones. Reef Limestones color white and pink, composed of limestone, gravel calcareous and coral. Breccia limestones and tuffaceous limestones calor gray, solid, well-bedded with an average l thickness layer of 40 cm. Distribution located at the southern coast of the part southwestern on the map sheet Jember and continuous Lumajang , some places contain manganese are deposited on the limestone unit, location Type at Puger districts. This formation is thought to Miocene middle to late Miocene (Van Bemmelen, 1949) thickness more than 400 meters , relationship Sukamade Formations with Puger Formations unconformity.

2.4 Structural geology

Geological structures developed in beaches Papuma are folds and faults, folds syncline axis is located Puger Formation in the direction of East – West. Longitudional faults generally have a direction Northwest - Southeast, normal faults have towards the Northeast - Southwest .

3. Beach Papuma

3.1. Morphology Beach Papuma

This beach is located area of forestry is a beautiful beach in the form cape (Figure 3). the access road to the beach is very good, very beautiful scenery left - right of way either morphology composed by alluvial plains and very steep cliffs composed by breccias and limestones. Beach Papuma can be classified based on its constituent materials, namely: the rock beach (rocky shore) ie beaches composed by host rock hard of calcareous sandstones and beaches composed by loose material in the white sand.

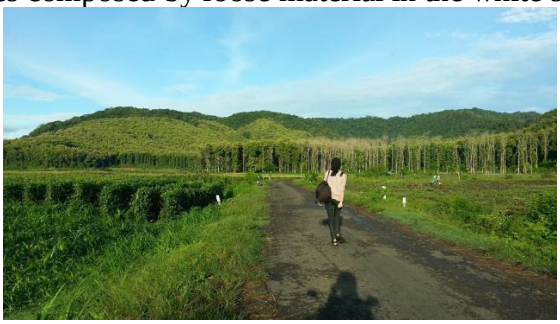

Figure 3. The access road to Papuma beach.

Based on the morphology Papuma beach it can be divided into: beach cliffs (cliffed coast), That the beach has a vertical cliff. This suggests that the existence of a cliff in a coastal erosional conditions, cliffs that form may be climbing on the bed rock breccias

3.2. Geology of Papuma Beach

Distribution of rock contained Papuma beach consists of turns calcareous sandstones with silt, sandstone, breccia, and coastal sediment. Stratigraphy can be seen clearly on the steep coast from the bottom to the top is turns calcareous sandstone with silt, sandstone and breccia. Position bedding in general N 350^0 E / 10^0.

Calcareous sandstones color whitish gray , the size of grains of medium - coarse sand, sedimentary structures parallel bedding, the mineral composition of the material

consists of rocks and carbonate minerals, the thickness of these rocks are exposed on the coastal line of 1.5 m.
Gray sandstone, grain size medium - coarse, mineral composition composed of rocky material, sedimentary structures graded bedding and parallel bedding , the sandston thickness is 1.6 meters.
Breccia is color gray , grain size gravel, andesite fragments, matrix of sand, silica cement, the thickness of 2m.
The rocks above anyone encountered alteration propilit with many found veins of quartz an average thickness of 1 cm , the general direction of vein N 110^0 E / 30^0.
The structure that develops on the beach Papuma generally direction plane fault longitudional N 330^0 E / 60^0 and N 20^0 E / 70^0, this fault are each intersection which causes the formation of the landscape that exists today.(Figure 4).

Figure 4. Direction of fault plane N$330^0/60^0$

3.3. Geoheritage Landscape
Based on the preparation of technical specifications geopark (May Wu, 2013), Papuma beach area is divided into three main categories, 5 (five) category 5, 5 (five) subkatagori (Table 1).

Landscape shaped Column
The landscape is composed by lithology consists of a thick calcareous sandstones with a 2.5 meter (Figure 5), above pebbly sandstones with thickness of 4.5 meters, the top composed by breccias with a thickness of 3.5 meters, at the bottom of the east side has suffered abrasion and dissolution.
This isolated landscapes due to faults trending N 200 E, lithology consists of calcareous sandstones which further due to abrasion by the sea water is formed landscape pole.

Figure 5. Landscape shape column.

Landscape like frog animals

The landscape resembles a frog animal composed lithology sandstones with a thickness of 25 cm - 1.2 m (Figure 6) the structure of sedimentary graded bedding, parallel bedding, and convolute lamination notch bedding N 340^0 E / 20^0, the landscape was formed due to a fault with directions N 330^0 E, where the breccia above the sandstones have experienced landslides due to abrasion by the activity of sea water.

Figure 6. Landscape like frog animals

The landscape of stone with a hole

The landscape has a rock formation perforated and rock fractures, lithology making up the landscape calcareous sandstones alternating with silt, thick calcareous sandstones 20 cm - 50 c, silt 10 cm, the position of the layer N 350^0E / 10^0 (Figure 7), the age of rocks based on foram plangton N 10 - N12 (lower Miocene), the landscape as a result of the dissolution process to form a hollow stone, stone broken due to abrasion of sea water due process of sandstone with hole. The boundary between the rocky coast with sandy beaches such as fault longitudional directions N 3300E (Figure 8).

Figure 7. The landscape of stone with hole

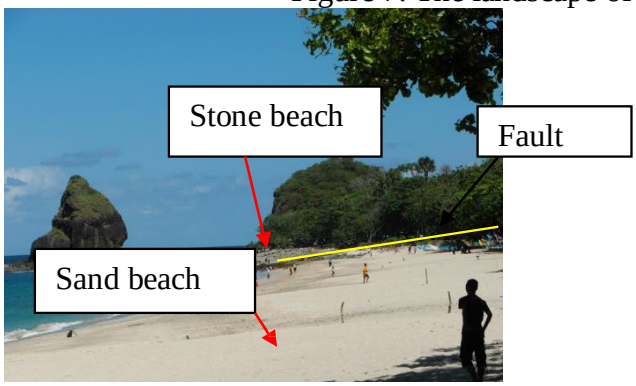

Figure 8. boundary beaches stone with sand

Ecology at the Papuma beach

The existence of some animals accustomed to human activity adds to the atmosphere of the Papuma beach very charming and beautiful, because visitor Papuma beach can see and close the animals that have been benign among other lizards and monkeys (Figure 9).

Figure 9 . Lizard animals on Papuma beach

Tabel 1. classification type geoheritage Papuma region

CONCLUSION

Papuma beach with various forms of geoheritage landscapes as great for tourism, research, and education. Besides the beach is famous the beauty for the beach and the mountains, and excellent ecological conditions that contribute to the high aesthetic taste and behavior of the existing fauna. Therefore it can be built into a science park integrating functions such as scientific research, roads, recreation ecology, and cultural arts activities that entertain by see direct forms of landscape diversity.

BIBLIOGRAPHY

Leman, M., S. 2006. The Malaysian Geopark: Langkawi Sight and Sounds, Issue 2, 2006: 9-11.

Postuma, J.A. 1971. Manual of Planktonic Foraminifera: Royal Dutch/Shell Group,The Hague, Netherlands.

Samodra, H., dan Wiryosujono, S. 1993. Stratigraphy and tectonic history of the Eastern Southern Mountains, Jawa, Indonesia, Journal Geologi dan Sumberdaya Mineral, No. III, 14-22.

Van Bemmelen, R. W. 1949. The Geology of Indonesia, Vol. 1 A, Government Printing Office, Nijhoff, The Hague, 732 p.

van Zuidam, R.A. 1979. Terrain Analysis and Classification using Aerial Photographs: A Geomorphological Approach ITC, Text Book.

Mei,WU.2013.Geoheritage Landscape Type sand Value Evaluationin Funiu Mountain World Geopark, Journal of Landscape Research 2013.5 (1-2): 43-46

Maincatego	**Category**	**Subcatagory**	**Remarks**
Geologic	Stratigraphic	Stratigraphic	Sukamade Formation , Puger
	Sedimentary	Fasies	Sediment beach
Geologic	Structural	Little structural	Fault longitudional of
Landscape	Landscape	Landscape	Cliff
	structural		
	Landscape	Landscape	Rock and sand beach
	beach	And dissolution	