

GEOECOLOGICAL STUDIES AND COMMUNITY PARTICIPATION IN THE MANAGEMENT OF THE ECOSYSTEM OF SIUNG-WEDIOMBO COASTAL AREAS AS A BASIC DEVELOPMENT OF SUSTAINABLE NATURE TOURISM IN GUNUNGKIDUL

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A B S T R A C T

Coastal area of Siung and Wediombo is a potential coastal line for the development of coastal nature tourism in Gunungkidul Regency. However, not many people know about the genesis or the process that causes the uniqueness of nature in the coastal region. Therefore, it is necessary to conduct a study that reveals various genesis and natural potentials that can support the development of this region as a potential coastal tourist area, as well as to disclose some related issues that must be addressed wisely. Geocology is a basic concept that combines geomorphological views with aspects of the ecosystem. This concept is expected to be the solution to the above problem. Thus, the management of the coastal areas can be integrated, sustainable, and maintaining environmental functions, which also takes into account economics and ecological balance, supported by good community participation as well.

KEYWORDS : coastal area, geocology, and community participation

I N T R O D U C T I O N

Background and Problems

Coastal area in the coastal tourist area of Siung to Wediombo which is located in Gunungkidul Regency is one of the complex beach areas. The complexity of this region is indicated by the existence of variations in the lithology of the

composer, there is a broken structure, and beautiful pocket grip. This shows the difference in genesis in its formation. Based on its genetic, the area of Siung to Wediombo is formed by the alliance of fault structures with Paleo volcanic activity, in a karst span (Figure 1). The sign is a steep cliff in the western part composed by the lower Miocene limestone that forms the karst topography, and the steep cliffs in the eastern part composed of riolit and andesite igneous rocks from the Paleo Oligocene volcanoes ridden by tuff. While in the middle there are beautiful pocket-shaped bay.

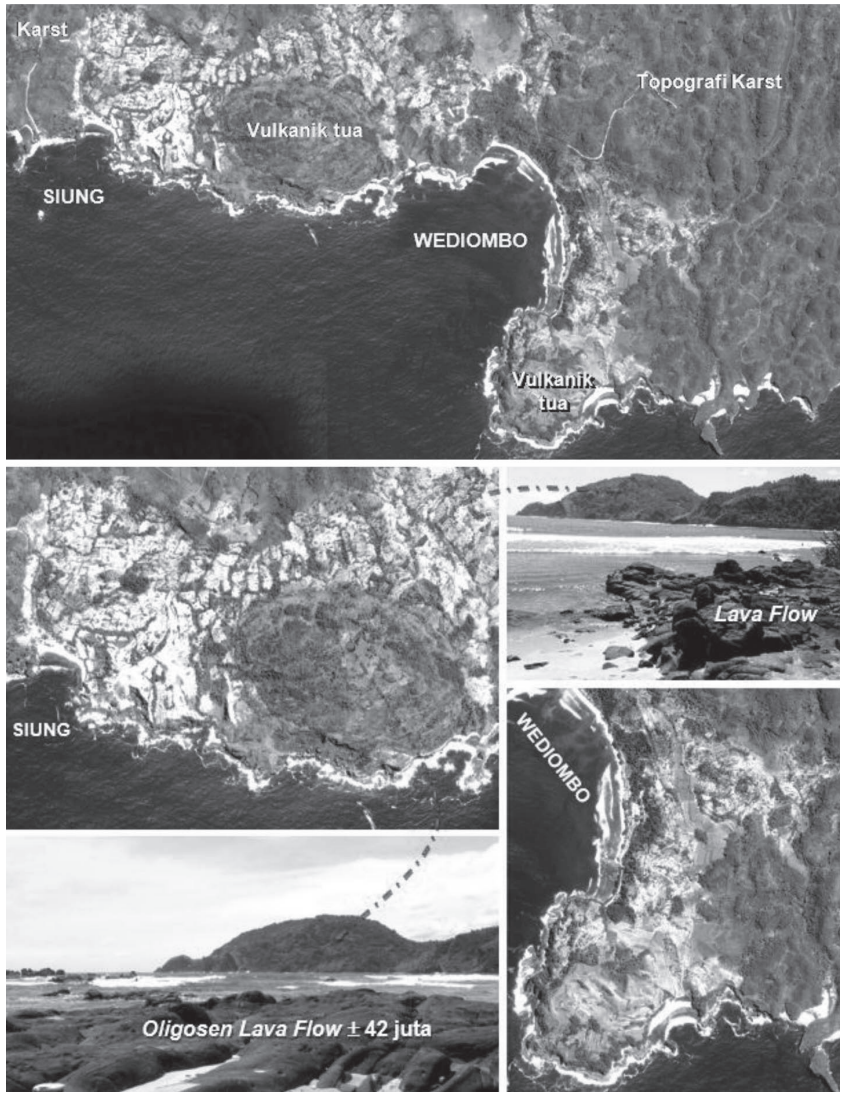


Figure 1A The appearance of Siung-Wediombo Coastal Area from Citra Quickbird in 2015 which shows the results of the process of Paleo volcanoes activity with the plumbing platform in the form of frozen rocks of former Oligocene lava flows between the Landscape of Karst in Gunungkidul Regency (Photo: Santosa, 2015 in P3E Java, 2015)

Natural phenomena in Siung and Wediombo coastal area is very interesting to study further in relation to the type and characteristics of geocology. Given that coastal area Siung and Wediombo is one of the flagship location of coastal natural tourist area in the district of Gunung Kidul. Geocology a basic framework or basic concepts that combine the geomorphological aspects and the ecosystem (Huggett, 1995). Lithological variations composer, structure and stratigraphy rocks at Siung coastal area, which is supported by the specific morphology namely morphology bay surrounded by steep hills forming a promontory and the presence of dynamic pocket beach, will certainly affect the characteristics of its geo-ecosystem. Geocology will be able to unveil the potential of natural resources and environment to answer the various problems found in this study area, which can then be used as a basis for efforts to support the region and its management as a natural tourist area.

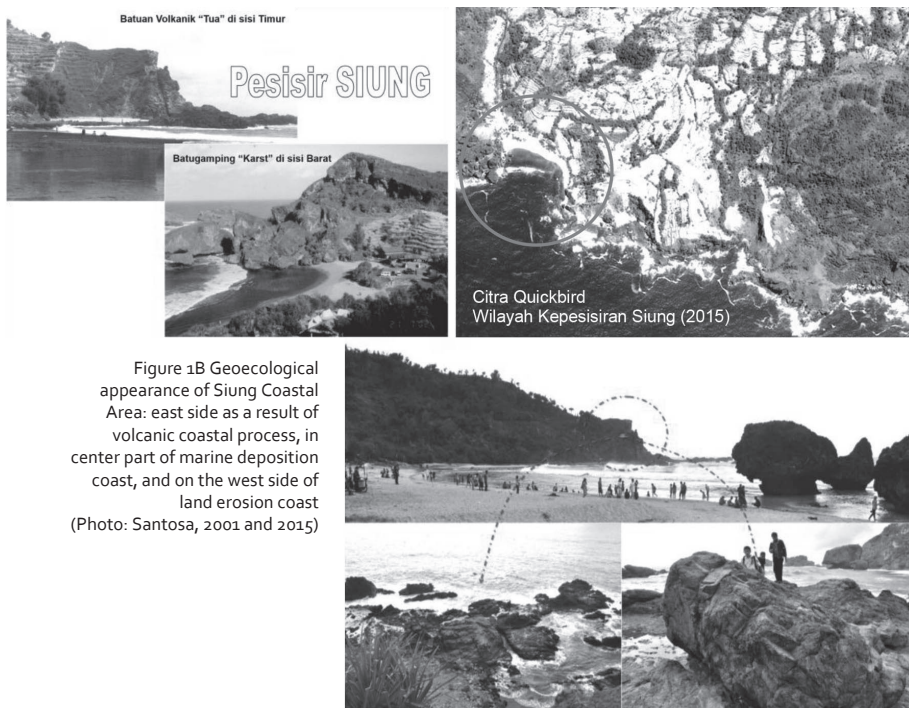


Figure 1B Geocological appearance of Siung Coastal Area: east side as a result of volcanic coastal process, in center part of marine deposition coast, and on the west side of land erosion coast (Photo: Santosa, 2001 and 2015)

The study approach that can be applied in this study is by arranging and limiting geomorphology units of landscape constituents of coastal areas. In addition it can also be analyzed which components have potential for development, and which factors are positioned as development constraints. Based on that thought, then can formulated a strategy of ecosystem management of coastal area to support the function of natural tourist area in Siung beach.

The use of natural resources in the coastal area should be done correctly. It is necessary to understand the process of its formation, typology, and geocological characteristics. Another important thing is the understanding of the dynamics of the the area that will occur. If not done properly, the utilization of natural resources can lead to problems of sustainability of natural resources to meet the needs of the population in the future.

Improper use of natural resources will ultimately hamper the pace of regional development and affect regional resilience. Another impact is the problem of community stability in the whole coastal area. Based on the concept of thought and facts described above, and in order to realize the management of natural resources in the coastal area as part of sustainable development, it is very important to study geocology of coastal areas and community participation. Practically, community participation is a form of cultural wisdom as part of efforts to protect and manage the natural resources of the coastal area to support its function as a natural beach tourist area.

Based on these facts, it is urgent to know in detail the genesis, characteristics, potential, and distribution of natural resources in relation to the ability to meet the economic needs of society today and the future. In addition, it is also very necessary to build full awareness for all levels of citizens to continue the function of ecosystems as well as part of the effort to maintain the sustainability of environmental functions as a whole. It needs a strategic and policy effort on the management of the coastal area. This includes recommendations for planning, utilization, protection of natural resources and the preservation of overall environmental functions. Referring to the facts and academic thinking, it is important to do research with the title: “Geoecological Studies and Community Participation in the Management of the Ecosystem of Siung Coastal Area as a Basic Development of Sustainable Nature Tourism in Gunungkidul Regency”.

Goals

The purpose of this paper is part of the ongoing series of research:

- (1) to study the genesis and geocological characteristics of Siung and Wediombo coastal areas based on geomorphological approach; and
- (2) to examine the participation of the community that demonstrates the cultural wisdom of the community in the management of the Siung and Wediombo beach.

The Development of Coastal Area

The success of development depends heavily on the outcomes of interaction and integration among development components, which consists of natural resources, human resources, capital, technology, and managerial capabilities (institutional organization). In addition, the results of such interactions must occur in a sustainable manner ecologically sustainable, economic sustainability, socio-cultural sustainability, and political sustainability. The concept of integration and sustainability are two main issues that must be considered in order to improve the welfare of society at this time and the next generation (sustainable development). Disharmony in dealing with these two aspects will result in decreased public welfare or increasing poverty. This will be more severe with the occurrence of environmental damage and degradation. One area that is important to be studied and developed because it has a unique in typology and development is the coastal area.

The Coastal area is one of the areas rich in natural resources. Coastal areas potentially support sustainable development programs. Natural resources of coastal areas will be a source of new growth and become a major foundation for the sustainability of national development in the future. This is because of the vastness of Indonesia's maritime territory with the rich coastal areas of natural resources. Coastal areas are a unique ecosystem that can be seen from different angles. Development experts consider the coastal area as a separate development unit, because it has a unique ecosystem, potentially economic, and has a distinctive social culture (Bappenas, 1987 in Santosa and Suastika-Jaya, 2000).

The above conception provides an understanding that the area of the coast is a dynamic ecosystem and has a wealth of diverse habitats, both on land and at sea with the interaction between the habitats. In addition to having great potential, the coastal area is also the easiest or most vulnerable ecosystem affected by human activities. Land in the coastal area is also often regarded as a marginal land, which seems to have no economic importance to the land except for the final disposal of various garbage and industry (Gunawan, et al., 2005).

It is further explained that recently in many coastal areas has changed its utilization, which is to become an elite area for tourism development, thus increasingly plays a role in increasing the value of coastal area. Therefore, the coastal area is an important region as main consideration in the sense of integrated management in achieving sustainable functions. Changes in land function are always followed by changes in economic value. The economic function of a land is usually followed by a multiplier effect. It means that the development of other activities directly or indirectly related to the main

economy. This adds to the complexity of interest to a land. Every change results in the emergence of social upheaval, although the change is natural. There are many arguments from various perspectives to examine the coastal area in depth, integrated and sustainable. Discussions like this continue to grow considering the use and direction of the development of the more complex and intensive coastal areas.

Geo-ecology of Coastal Area

The development of the coastal area holistically will certainly be more useful. This can happen if the approach used incorporates influential environmental factors in the coastal area. One approach that can combine these environmental factors is the geocological approach. According to Huggett (1995), geocology examines the structure and function of geoecosystems. Geoecosystem is a geo-ecological system defined as a landscape unit composed by components of the biosphere, atmosphere, toposphere, pedosphere, hydrosphere and anthroposphere. These components together form a whole unity. These six factors in environmental science are known as abiotic, biotic, and culture components.

The geocological unit is composed of the landform as a mapping unit, with fillers in the form of topography, soil and rock, water, climate, biota, and cultural (socio-cultural) components. The description of the geocological unit filler components is a geo-ecological characterization. Geocological unit is used as a unit of analysis for coastal tourism activities and marine tourism. Based on the requirements of the activities of each type of coastal tourism and marine tourism, then every geocological unit that has certain characteristics can be assessed both the potential and the constraints.

These potentials include strengths and opportunities to develop. While the constraints are weaknesses and threats. This potential analysis and constraint is referred to as SWOT analysis (Strengths, Weaknesses, Opportunities and Threats). SWOT analysis is done by using matching and professional judgment technique to the requirement of allotment of tourism with geocological unit as unit of analysis. Each particular geocological unit can have one or more tourism potentials that can be developed. Thus, based on the many types of tourism activities in each geocological unit can be used as guidance to determine the type of geocology of the coastal area.

The strengths and opportunities in each geocology typology are attempted to develop. This is done so that the development of tourism can be achieved, namely to introduce and utilize the natural beauty and natural culture of archipelago. While the weaknesses and threats to each type of geocology sought to be addressed and managed. Thus things that harm and disrupt the integrity and authenticity of ecosystems of the coastal areas can be avoided (Dahuri, et al., 1996).

The Local Wisdom

Issues in the management of coastal areas tend to increase with increasing population, industrialization, conversion of land for cultivation, settlements, and construction of public facilities. On the other hand the ability of nature to maintain its sustainability is very limited and takes a very long time. In order for the utilization aspect to be sustainable, the resources of the coastal area need to be preserved, both in terms of quantity and quality. Maintaining and protecting the natural resources potential of the coastal area from pollution due to waste or other forms of human activity is part of an integrated and sustainable effort to protect and manage coastal areas. Population growth and regional development become an important aspect in relation to resource utilization and protection of environmental sustainability functions. Therefore, community participation is absolutely necessary in order to preserve the natural resources and the preservation of ecosystem functions in the coastal area.

Community participation is crucial to the pattern of natural resource use in the coastal area. According to the Minister of Home Affairs Regulation No. 5 of 2007 on Guidelines for the Structuring of Community Institutions, community participation is a form of active participation and involvement of the community in the development planning process. In general participation is a process of growing awareness of the interaction between different stakeholders in society, ie between social groups and communities with policy makers and other service institutions (Dasman, 1992). So in the participation of anyone can play an active role. Anyone has oversight of his own life, takes a role in society, and is more involved in development.

Collaboration between the ecosystem and sociocultural (socio-cultural) is one important effort to maintain the preservation of the ecosystem of the coastal area. The cultural wisdom of local communities then becomes the hope to bridge the protection of the coastal areas of both the present and the future. The widespread nature of local wisdom can also be referred to as “local wisdom” or “local knowledge” or “local knowledge”. The community views the coastal area as having a social function as a unifier between citizens, establishing social relations, mutual cooperation and togetherness. In addition, the burgeoning territory of the annual rituals by holding art and culture. This is a sign that the area of the storm is one of the vital parts that support life. It is important to preserve the ecosystem with their local wisdom.

Local wisdom is a life view, science and life strategies that are tangible activities, conducted by local communities in answering various problems to meet their needs (Andrew, 1990). Local wisdom is a dynamic, growing and sustained source of knowledge by a particular population that is integrated with an understanding of nature and the surrounding culture. Religion, culture, and institutions in society are the spaces used to strengthen local wisdom.

All three components they already have and walk in everyday life. Some of the local wisdom that is used by most of the community in maintaining the sustainability of the coastal area, among others by strengthening the access of local wisdom based on religion, strengthening local-based cultural wisdom, and strengthening local wisdom-based community institutions.

Theoretical Framework

Based on the research problems as described above, and supported by various concepts and theories about geocology and development of coastal areas, as well as various forms of community participation that demonstrate cultural wisdom in the management of coastal areas, it can be formulated as the theoretical framework of research, as presented in Figure 2.

RESEARCH METHOD

The method used in this research is the survey method which emphasizes on the primary data survey, which is completed with secondary data on various study objects, both geocologi and socio-cultural aspects in the management of Siung and Wediombo areas. Geocological data is observed and measured purposively sampling, while socio-cultural data is measured and chosen by accidental sampling. Accidental sampling is undertaken to select and sample correctly from a population based on its importance and consideration, so that it can be used as a representative sample for the population (Nasir, 1982). Furthermore, the data are analyzed quantitatively to get a real description about the value and spatial distribution on each study object in the research area.

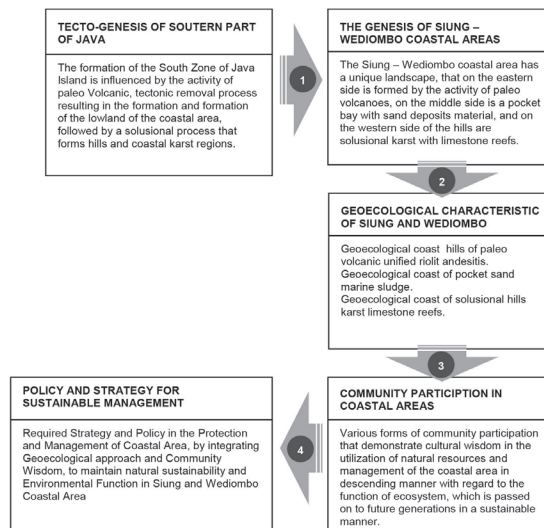


Figure2 Theoretical Framework "Geocological Studies and Community Participation in the Management of the Ecosystem of Siung Coastal Area as a Basic Development of Sustainable Nature Tourism in Gunungkidul Regency

GEO-ECOLOGICAL CHARACTERISTICS OF SIUNG AND WEDIOMBO

Genetically based on geomorphological and etymological reviews, the coastal area is a landscape that begins the marine border marked by the formation of a breakers zone to a landscape that is genetically altered by marine activity, such as coastal alluvial plain (formulated from the concepts of CERC, 1984; Pethick, 1984; and Sunarto, 2000). In accordance with the conception of the coastal area, geomorphologically based on the genetic point of view, the area of Siung until Wediombo ranges from breakers zone to hinterland in the form of rocky limestone hills of karst topography (karst cones). The wave break zone is a nearshore that extends parallel to the shoreline, along which the waves begin to break out of the white foam that rolls up and forms the swim to the shore. The outbreak of the wave is caused by the bumping of the wave base in shallow zones due to the slope of the seabed or shore platform. The distance of the wave break zone for each place varies depending on the slope of the seafloor and the seabed material. Furthermore, behind this shallow zone will be found shore which is a waters area bounded by the lowest tide to the highest tide line.

In the Siung and Wediombo coastal area, on this zone is the accumulation of white sand resulting from the process of disintegration or destruction of coral reefs and old volcanic rocks carried by the waves to the shore. The spreading pattern of sand material accumulation following the pattern of the bay, forming like a pocket, so called pocket beach. The hinterland in the study area is small hills like cones of rocky limestone that are part of the karst topography, so called karst cones (karst cones). The description of the cross-sectional area of Siung and Wediombo is shown in Figure 3, the geochemical zoning presented in Figure 4, and the geo-logical characteristics of the Siung and Wediombo islands are presented in Table 1.

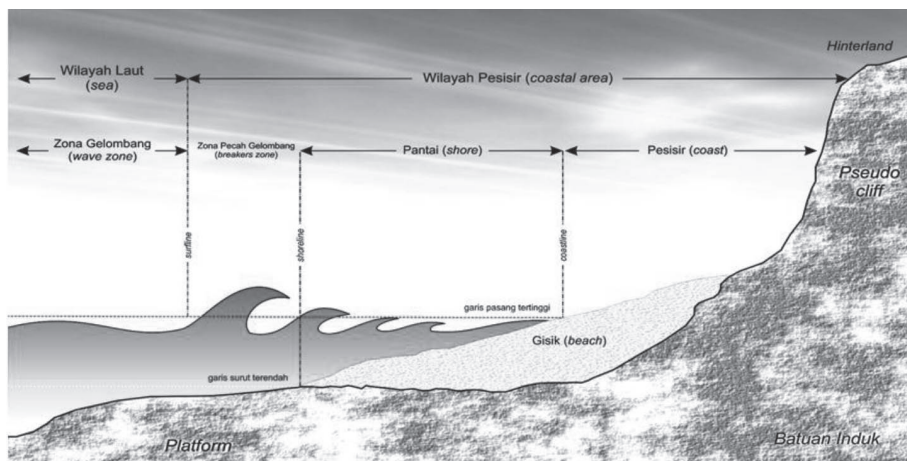
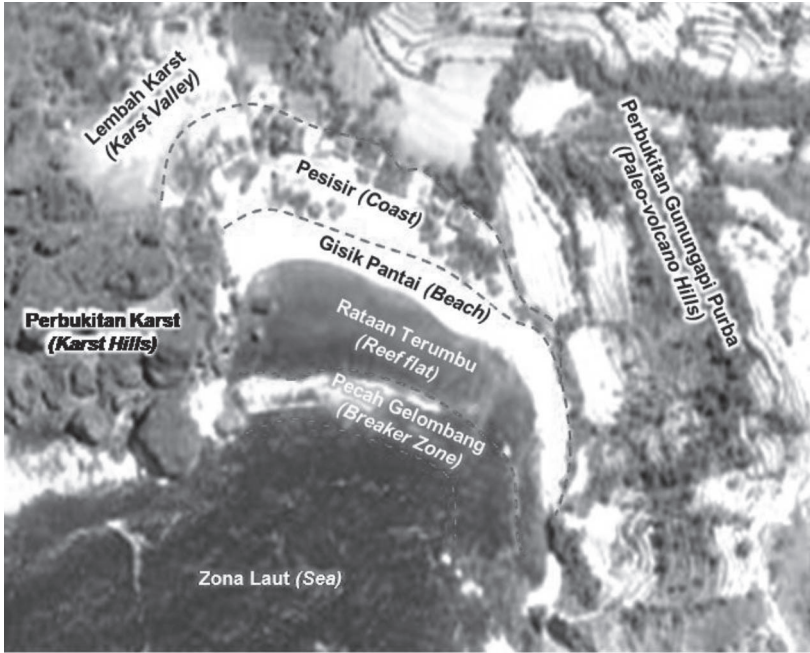
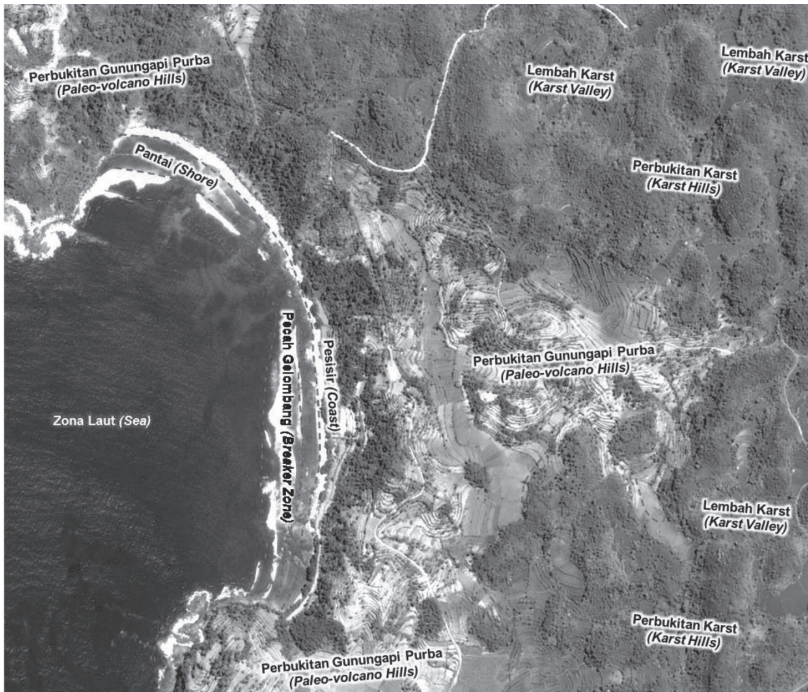


Figure 3. Geo-ecology of Siung – Wediombo coastal area (formulated from CERC, 1984; Pethick, 1984)



Gambar 4A. Zonation of Geocological Unit of Siung Coast
 (Sources: Interpretation of Quicbird, Google.earth, 2015)



Gambar 4B. The Zonation of Geo-ecological unit of Wediombo Coast
 (Sources: Interpretation of Quicbird, Google.earth, 2015)

Table 1. Geo-ecological characteristics of Siung and Wediombo coastal areas

Resources		Description on the Potency	
		Siung Coastal Areas	Wediombo Coastal Areas
Land Resources	Geomorphology	<ul style="list-style-type: none"> Topography is choppy to hilly, sloping sandy slopes. Shape of the bay. Limestone constellation rocks in the western and andesitic and ritual lava rocks tufted on the eastern end of the bay. Sedimentation on the gisik, erosion at the end of the bay and the beach. Small islands formed in front of the bay, mushroom-shaped. 	<ul style="list-style-type: none"> Topography is choppy to hilly. Sloping slopes of giraffe, bay shore form. Constellation of andesitic lava and rhyolite in tuff. At the west end of the bay are found dome lava and volcano neck. The bay is possible from the sinking volcanic crater. Sedimentation on gisik. Erosion at the end of the bay and the beach.
	Soil	<ul style="list-style-type: none"> Regosol, yellow (2.5Y7 / 6), sand texture, and grayish brown (10YR5 / 2), dusty sand texture. Rendzina, dark gray brown color (7.5YR4 / 2), clay texture. Litosol, brown to yellowish (7.5YR4 / 3 - 5YR4 / 6), dusty to sandy texture, thickness <25 cm. 	<ul style="list-style-type: none"> Regosol, yellow (10YR7 / 6), sand texture, and grayish brown (10YR5 / 2), sand dust texture. Rendzina, dark gray brown color (7.5YR4 / 2), clay texture. Litosol, brown to yellowish (7.5YR4 / 3 - 5YR4 / 6), dusty to sandy texture, thickness <25 cm.
	Land use	<ul style="list-style-type: none"> Coastal nature tourism not yet developed. Land settlements and fishing ports. 	<ul style="list-style-type: none"> Nature beach tourism. Land moor and settlement there are many around the beach and hills.
Biological Resources	Flora	<ul style="list-style-type: none"> Natural vegetation: pandanus, thistle, grass tekup, ipomea pescaprae, ferns on cliff walls and so on. Cultivated plants: acacia, waru, coconut and banana. 	<ul style="list-style-type: none"> Natural vegetation: pandanus. Cultivated plants: cashew nuts, ketapang, bananas, acacia and waru.
	Fauna	<ul style="list-style-type: none"> Pomfret, cucut, shark, shrimp, lobster. Wild fauna: apes in the hills karst (west). 	<ul style="list-style-type: none"> Potential fisheries have not been developed.
Water Resources	Climatology	<ul style="list-style-type: none"> Annual average rainfall of 2619 mm Monthly average temperature of 27.36 °C Relative humidity 78% 	<ul style="list-style-type: none"> Annual average rainfall of 2211mm Monthly average temperature of 27.38°C Relative humidity of 76%
	Surface and Ground Water	<ul style="list-style-type: none"> Surface water: river with DHL 525 μmhos / cm Flow rate <2 m / s surface water pH between 6.5-7.5 Flow condition during dry is always water Medium surface runoff potential 	<ul style="list-style-type: none"> Not found or no wells or surface runoff
	Oceanography	<ul style="list-style-type: none"> Wind direction hour 13.55 north, average speed 3.4 - 5.4 m / sec. Large wave ripple, wave crest starts to break, more white waves. Wave height \pm0.6 - 1.0 meters, wave period \pm 6 times per minute. A strong backflow is formed, and the type of spilling blows 	<ul style="list-style-type: none"> Wind direction at 12.30 northeast, average velocity 1.3 - 3.3 m / sec. Ripple waves uniform, shiny wave peaks, without froth and not broken. Wave height \pm0.3 - 0.5 meters, wave period \pm 6 times per minute. There is a current that hit the cliff is very strong and abbration, with the type of spilling blows.
Mineral Resources	Geology and Mineral	<ul style="list-style-type: none"> Limestone and white marine sand crushed coral reefs. 	<ul style="list-style-type: none"> Limestone.
Human Resources	Population	<ul style="list-style-type: none"> Livelihoods of the inhabitants as farmers and fishermen. 	<ul style="list-style-type: none"> Livelihoods of the dominant population as dryland farmers.
	Culture	<ul style="list-style-type: none"> There is no distinctive culture, similar to the beach area of Gunungkidul in general. 	<ul style="list-style-type: none"> Cultural rites (Labuhan) and nest swallow birds harvest 2 times a year.

The Geoecological units of beach-shore and coast is a narrow unit as the accumulation of marine sand along the beach and coast, especially in the shape of a bay. Beach and coastal area is a coastal border zone, and most have developed as a core area of coastal nature tourism. This unit can be said to have medium to high potentials reviewed based on the main function as a natural tourist area because it is supported by factors, namely:

- (a) the morphology of the plains with rather convex or choppy reliefs, formed by the marine depositional coast process, carrying sand-sized materials;

- (b) the dominant constituent material of white marine sand with high to medium roughness, formed by the destruction of coral reefs by waves and deposited along the shoreline by the waves; or black sand due to sedimentation of marine sand (the result of fracture of paleo volcanic rock, rhyolite-andesites) by wave activity;
- (c) the formation of soil has not face the differentiation of the horizon and still characterizes the clearly raw material (Regosol), although on older soils has begun to form weak gray A1 horizon, coarse grain texture (grain), the structure of crumbs, loose, and has not formed aggregate so easily eroded, in this case the erosion by the wind;
- (d) This geocology unit is the core area of coastal nature tourism, so that the dominant land use is the central of the tourist location with all supporting facilities; In the coastal zone is utilized as a development area of tourism facilities, such as: food stalls, souvenir trade, or campground; whereas the beach still left as an open land for tourist roads, sunbathing, and water attractions litoral zones (tidal zones);
- (e) on the front of the pocket beach is generally a platform and coral reef or reef flats, as well as seaweed. If the seawater subside, the beach will appear, so that tourists can enjoy the streets of this zone while observing the beautiful reefs and ornamental fish, take seaweed as one source of vegetable protein, and also can do snorkeling or swim to enjoy the beauty of coral reefs and ornamental fish.

The Geoecological units of karst valley are narrow and flat valleys located between karst cones, which are specifically behind or in the north, directly adjacent to coastal whispers, from the west to the east along the coast. This unit has the potential of moderate to high land resources, because it is supported by the following factors:

- (a) the morphology of a plane with a slope of 0-3%, formed by the process of sedimentation of fissile material or land erosional coast, and accumulates locally in this valley;
- (b) constituent material in the form of a mixture of alluvium materials due to sedimentation of hilly material eroded by surface water stream, or slope rupture due to weathering process of rock and accumulated mass movement forming a thick layer of clay to fine sand;
- (c) relative soil has developed to form A-B2t-R (Mediteran) soil horizon, clay texture, granular structure to clump, consistency very firm and sticky when wet, bright red to yellowish red (5 YR 4/6) , Slow permeability, soil solum 30 - 90 cm, pH 6.0 - 6.5, medium-high CEC, high base saturation, fertile and low to medium soil potential;
- (d) the geoecological unit is used by the population as rainfed lowland or dryland farms, with upland rice, peanut, maize, other crops, and vegetables.

The Geocological units of psedo-cliffs are narrow units that are locally-formed single karst hills directly opposite the sea. The low potential of land in this unit because it is a natural condition in the form of limestone karst hills with steep slopes, even steep cliff walls, and the process of erosion of a wave (abrasion) is very strong against the wall cliff facing the Indian Ocean. A strong abrasion process causes the formation of caves on the wall of the cliff (sea caves), which the longer the cliff wall crumbles and collapses into the sea forming a huge pile of rocks in front of a cliff called a stach. Such natural conditions cause these units to be left alone, not used for a cultivation designation, but only as accessories to add to the complexity of natural phenomena as coastal natural tourist areas. In the area of Siung beach, psedo-cliffs are used as a rock climbing location, especially on the western cliffs of coral reefs.

The Geocological units of karst cones is a low hilly land composed by limestone which is part of the karst topography of Gunungsewu Hill in Gunungkidul Regency. The low potential of land in this unit is caused by several factors, namely:

- (a) the slope is relatively sloping up to a steep slope of 15-40%, making it less supportive for cultivation management, particularly for agricultural development;
- (b) the condition of rocks composition in the form of coral limestone (solusional), many diaclast and dissolving holes, so that rain falling on it can not be stored well in this rock, but it will directly seep into and go into underground flow system that is difficult to trace its channel pattern;
- (c) coral reefs are relatively hard rock and not easily weathered, soil formation is very slow, very thin layer of soil directly contact with bed rock (Litosol), soil solum <25 cm, dusty clay texture until sandy clay, crumb structure until glob , consistency is rather firm and somewhat adherent when wet, brown to yellowish (7.5 YR 4/3 to 5 YR 4/6), low cation exchange capacity, moderate saturation, very low fertility and soil potential, and poor nutrients , thus less support for plant growth;
- (d) the appearance in the field of this morphological unit is an arid low hill, outcrop, naturally only a shrub that is capable of growing, allowing more populations to be in natural condition, or exploited as moorlands by land rotation, and in some places planted teak and acacia trees by the community.

The geocological units of paleo-volcano hills are low hilly terrains composed by old ololite-andesitis volcanic Oligocene (> 20 million years ago), which have undergone advanced weathering to form dust-gritty, texture-dusted soils. The soil is relatively poor nutrient, so it is utilized by the community for mixed crops and mostly in the form of bushes.

Community Participation in The Management Of Siung and Wediombo Coastal Areas

Participation of the people surrounding the Siung and Wediombo coastal areas is quite high. Along with the modernisation and tourism business in Gunungkidul Regency the process of urbanisation in these two beaches are very intensively happen. There are several aspects contributing to the development of the region, namely:

- (1) the development of public facilities around the coastal areas including road construction to support tourism along south shoreline of Gunungkidul;
- (2) industrialisation that is followed by significant increase of the number of population;
- (3) the development of dryland farming and intensive conversion of land for cultivation;
- (4) the development of supporting public facilities in the sense to improve standard of living of the people in the coastal area; and
- (5) the raising of awareness to preserve all kinds of resources in the coastal areas. This is form of local wisdom so called community participation which is absolutely necessary in order to preserve the natural resources and the preservation of ecosystem functions in the region.

Collaboration between the ecosystem and social system is urgently needed. There are several aspects as part of local knowledge of community in Siung and Wediombo. Firstly, related to the level of knowledge and education. Mostly the people are in the low level of education. However, they have much cultural wisdom to support their wise life. Secondly, it is the raise of technology in cultivating the dryland. This technology has supported to the community to perform sustainable farming. Thirdly, the existence of family tied and the development of social organisation. It has embedded to the whole behaviour the community. Fourthly, cultural tied which is exist from one generation to the next. It has formed vital culture that supports their life. Religion, culture, and local institutions in society are altogether strengthening local wisdom.

C O N C L U S I O N

- (1) Genetically, the Siung and Wediombo coastal area are formed by paleo-volcanic activity in the Tertiary Period in the southern zone of Java Island, which began at the Oligocene (> 20 million years ago), so geomorphologically can be classified as a typology of the volcanic coastal area. The geoecological units developed in these two coastal areas include: braeker zone, shore with reef flat at Siung, paleo-volcanic platform at Wediombo, shore-beach, sandy coast, karst psedo-clif, karst valley, karst cones, and paleo-volcanic Hills. Each of these geoecological

units has potential resources to be developed to support the management of the coastal area as a natural tourist area.

- (2) Community participation in Siung and Wediombo coastal area is quite complex. Theoretically the landscape has big influence to the behavior of the people so called “idiographic model”. There are three main existed livelihood, namely dryland farmers, fishermen, trading and services related tourism.
- (3) The live of coastal communities are influenced by some cultural rites and local wisdom. There are some local knowledges and local wisdom to perform dry land farming which is inheritance from one generation to another. The people always adjust to the environmental condition and the land in the way to maximize crops and other farming production. It is very high value of the community to maintain the fertile land and sustainable cultivation.

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