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Geological Features of Geosite Objects Geotourism Development in District of Selayar Island

Irvan Thamrin

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Irvan Thamrin
Doctoral Program Geological and Environmental, Hasanddin University

irvan.thamrin@gmail.com

Abstract. In the current trend, nature tourism is one of the most popular activities. Nature tourism has its own uniqueness, especially in terms of geological aspects. Geological aspects are important aspects that make up the earth's surface, such as its natural appearance (geomorphology), its constituent rocks, and its geological structure. This results in different characteristics in each location. The purpose of this study is to determine the value of the assessment which is the benchmark in the development of geotourism objects in the research area. This research was conducted in the Selayar Islands Regency, namely on Bahuluang Beach, Bukit Kampung Tua Bitombang, Jammeng Waterfall, Nane Polassi Island, Tinabo Island, Jinato Island, Latondu Island, and Tarupa Island. The research method is carried out in the form of taking geological field data such as geomorphological data, lithological data, and geological structure data. The results showed that the lithology found was limestone in the area of Bahuluang Beach, Tinabo Island, Jinato Island, Latondu Island, and Tarupa Island, sandstone lithology was found in two areas, namely in Bukit Kampung Tua Bitombang, and porphyry basalt lithology in the area of Nane Polassi Island. Geomorphological units that are found include Denudasional hill units and Marine units. The geological structure found is a shear joint on Nane Polassi Island with a minimum stress direction of N285°E and a maximum stress of N15°E.

Keywords: geosites, geological feature, geotourism

1. *Preliminary*

The geological aspect is the most influential aspect in the formation of a natural tourism area or geotourism. Geological aspects play a role in the formation of geomorphology and the unique appearance of a geotourism object.

The regional stratigraphy of Selayar Island consists of 5 (five) formations namely the Camba Formation (Tmc), the volcanic Camba Formation (Tmcv), the Walanae Formation (Tmpw), the Selayar Member Walanae Formation (Tmps), and the Alluvial Formation (Qac) (Sukamto and Supriatna, 1982). based on the unique geomorphological appearance in the study area and supported by lithological conditions that have unique appearances and characteristics can be a separate attraction as a geotourism object.

The purpose of this research is to determine the value of the assessment in the research area as a basis for the development of geotourism objects.

2. Research Method

2.1 Research Site

This research was conducted in Selayar Regency, namely on Bahuluang Beach, Kampung Tua Bitombang Hill, Jammeng Waterfall, Nane Polassi Island, Tinabo Island, Jinato Island, Latondu Island, and Tarupa Island.

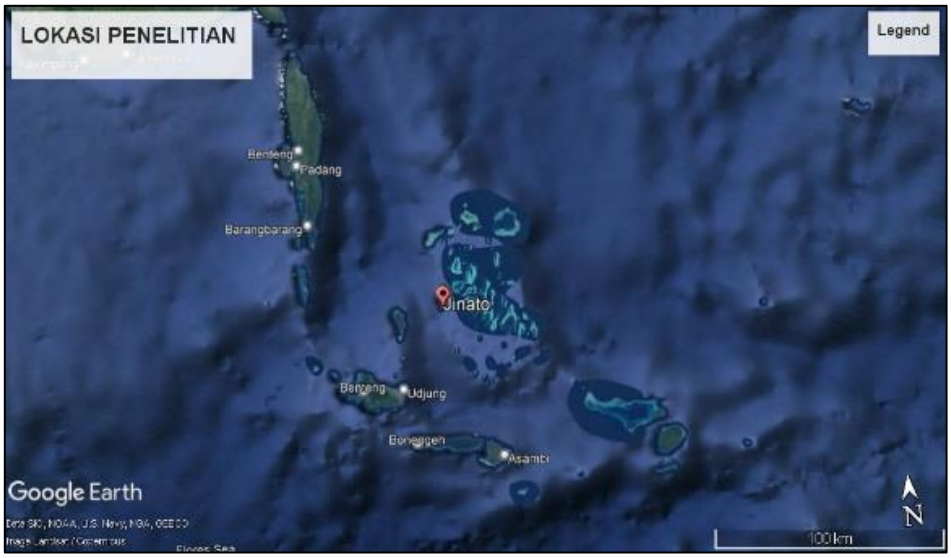

Fig. 1. Location guide map

2.2 *Research Stages*

Method This research was conducted by means of geological mapping with the focus of the data taken in the form of geomorphological data, lithological data, and structures.

This geomorphological data retrieval includes observing the appearance of relief, rivers, soil, and weathering levels.

Lithological data collection includes data collection of rock outcrops, by observing the processes that have occurred in the rock outcrop.

Structural data collection includes rock joint data collection to determine the direction of the force.

3. Results and Discussion

3.1 Lithology of research area

The lithology of the research area found in the form of coarse sandstone, very fine sandstone, limestone, and porphyry basalt.

3.1.1. Coarse sandstone

This coarse sandstone is found in the Kampung Bukit Tua area of Bitombang. Megascopically, this lithology has a fresh white color, weathered black color, grain size mm (wentworth 1922), poor sorting, high permeability and porosity, has a matrix composed of carbonate material in the form of remains of organism shells cemented by carbonate liquid.

These coarse sandstones can form transition zones, or shallow seas. The state of the waves that continue to hit the coastal area causes the remains of the organism's shell to be destroyed. Then deposited in the shallow marine zone. Based on the comparison to the sandstones in the Walanae formation, these rocks are Pliocene – Miocene in age. This coarse sandstone can be exposed to the surface can be caused by a decrease in sea level or uplift.

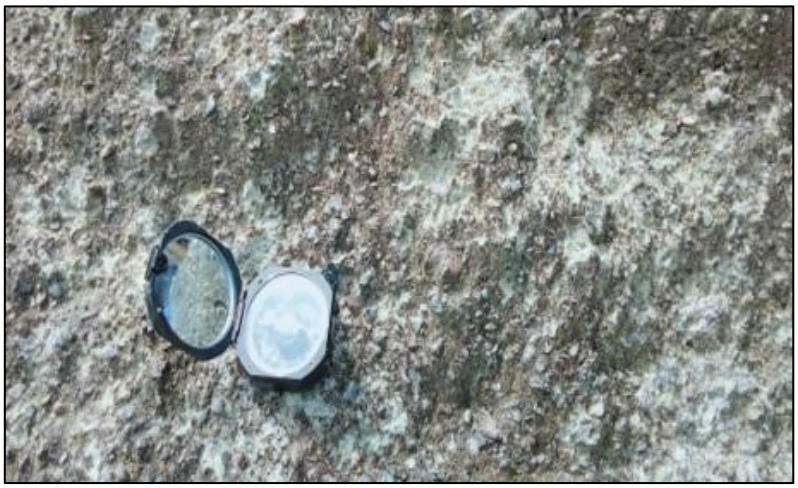

Fig. 2. Coarse sandstone

3.1.2. Very fine sandstone

These very fine sandstone can form transition zones, or shallow seas. The state of the waves that continue to hit the coastal area causes the remains of the organism's shell to be destroyed. Then deposited in the shallow marine zone. Based on the comparison to the sandstones in the Walanae formation, these rocks are Pliocene – Miocene in age. This coarse sandstone can be exposed to the surface can be caused by a decrease in sea level or uplift.

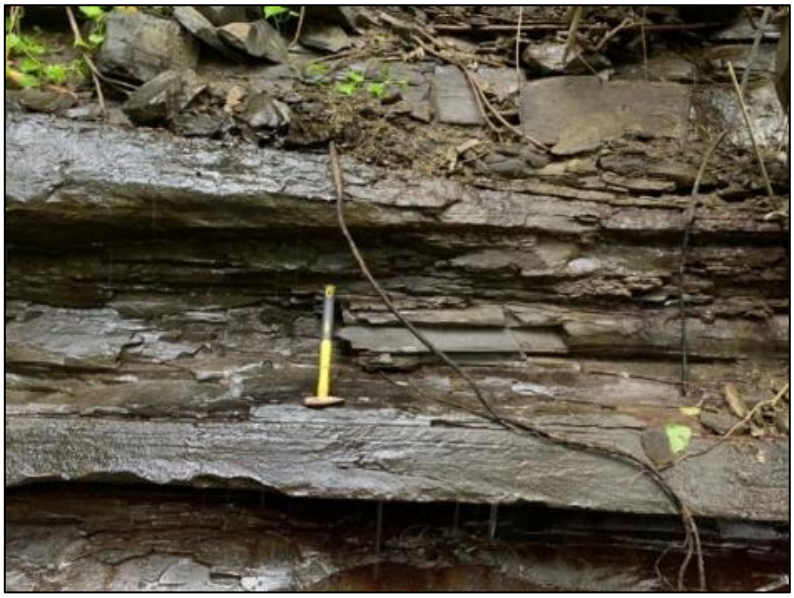

Fig. 3. Very fine sandstone

3.1.3. Sandy limestone

Sandy limestone found in Tinabo, Jinato, Latondu, and Tarupa. Megascopically this lithology has a fresh white color, weathered blackish brown color, grain size 1 – 2 mm (wenthworth, 1922), poor sorting, high permeability and porosity. This sandy limestone is composed of carbonate material in the form of the remains of organism shells and cemented by carbonate liquid.

These sandy limestones can form transition zones, or shallow seas. The state of the waves that continue to hit the coastal area causes the remains of the organism's shell to be destroyed. Then deposited in the shallow marine zone.

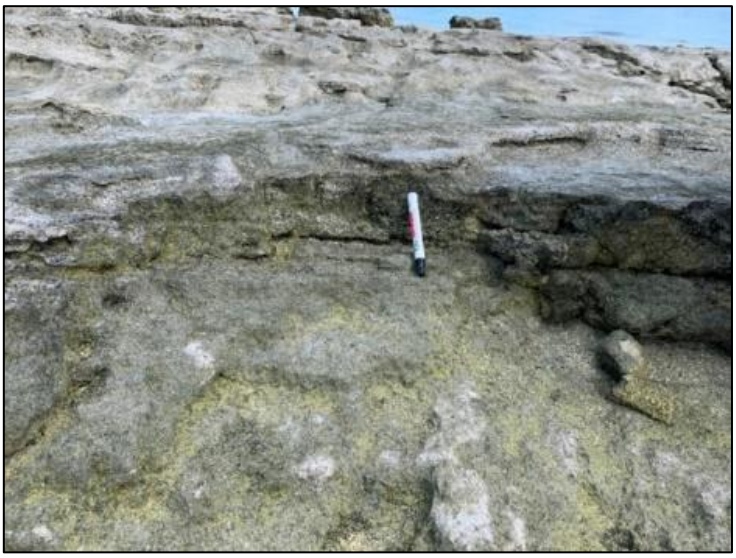

Fig. 4. Sandy limestone

This sandy limestone has physical characteristics that are comparable to the sandy limestones in Bonerate with the Pliestocene – Holocene age.

3.1.4. Crystalline limestone

This crystalline limestone is found in the Bahuluang beach area. Megascopically, this lithology has a fresh white color, weathered blackish brown color, and has a crystalline texture. Physical characteristics such as stalactites and stalagmites were also found as a result of the dissolving process.

These crystalline limestones can form in shallow marine zones, with currents starting to calm down a bit. This crystalline limestone has a late Miocene to early Pliocene age based on the proportions of the Walanae formation in the Selayar members.

3.1.5. Porphyry basalt

This porphyry basalt is found in the area of Nane Polassi Island. Megascopically, this lithology has a fresh blackish color, with a weathered brownish color, aphanitic porphyro, hypocrystalline, and inequigranular.

The mineral composition is composed of a base mass, pyroxene. Porphyry basalts are generally formed as a result of magma intrusion that undergoes rapid freezing. So that the minerals do not experience perfect crystallization or are small. This porphyry basalt has undergone jointing, giving it a cracked appearance. This porphyry basalt has a Cretaceous age.

3.2 The geological structure

The geological structure found in the form of shear fracture with a total amount of data taken is 31 data. The data is then processed to determine the direction of stress.

Based on the results of data processing, it is found that the direction of drinking stress is 1 = N 285° E, and the direction of maximum stress is 3 = N 15° E.

3.3 Geomorphology

The geomorphology of the research area is dominantly composed of marine and denudational units which are geographically located in the archipelago. It will be discussed in detail as follows

1. Bahuluang Island

Bahuluang beach has a marine landform characterized by a sloping topography with a slope of 0-2% with a height difference of less than 5 meters. Flat relief, coastal plain morphology, 2°

slope. At this site there are several karst accessories such as stalactites, caves and some found in the form of dolina and small rivers. However, it cannot be categorized as a karst landscape because the area is narrow and not mapped according to the unit requirements in SNI.

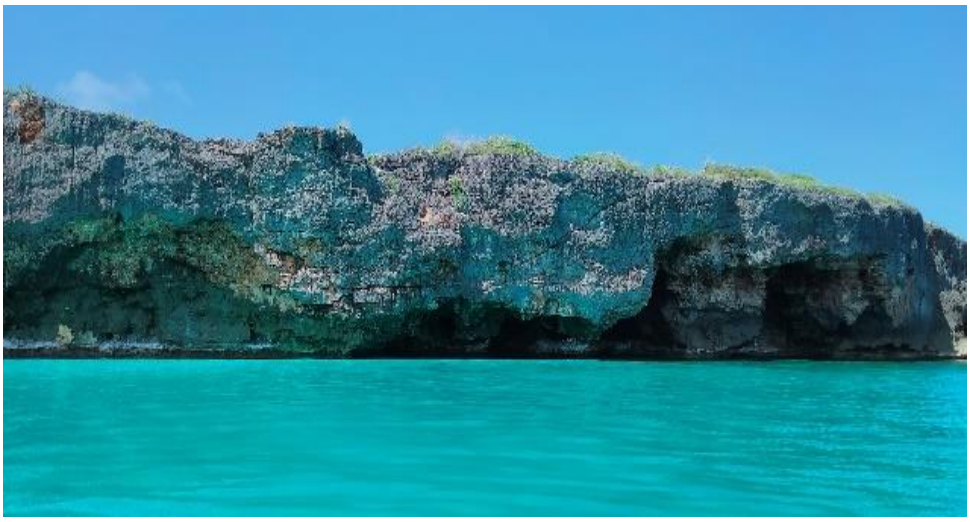

Fig. 5. Bahuluang Island

2. Tinabo Island

Marine landform units are characterized by a sloping topography with a slope of 0-2% with a height difference of less than 5 meters. Beach slope 2° Flat relief, with a coastal plain morphology. The presence of marine elements on this island, such as coastal abrasion, shows that there is control from the sea over this location

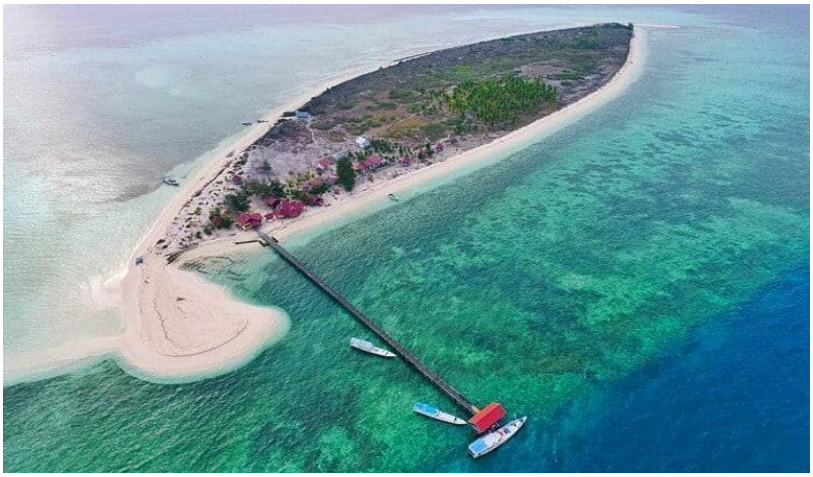

Fig. 6. Tinabo Island

3. Jinato Island

Marine landform units are characterized by a sloping topography with a slope of 0-2% with a height difference of less than 5 meters. The relief is flat-sloping, with the

morphology of the coastal plain, the beach slope is 4°. At this location, there is sea control in the form of coastal abrasion.

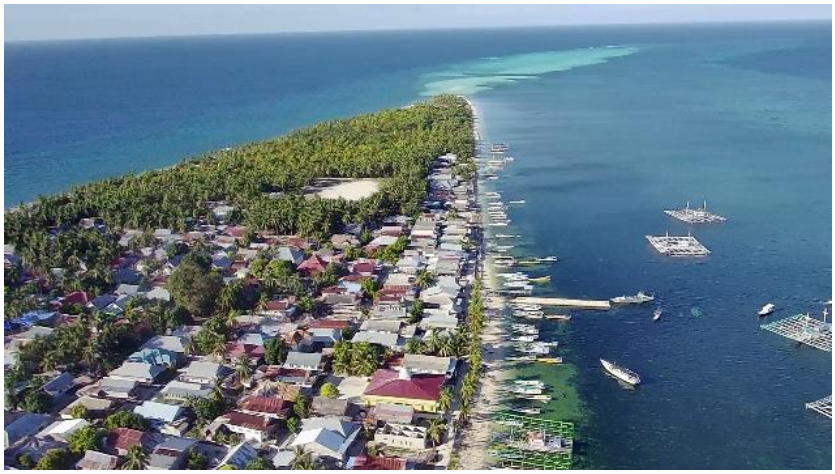

Fig. 7. Jinato Island

4. Latondu Island

Marine landform units are characterized by a sloping topography with a slope of 0-2% with a height difference of less than 5 meters. Flat relief, morphology of the coastal plain, 2° coastal slope. At this location there are abrasions that control the coastal area

Fig. 8. Latondu Island

5. Tarupa Island

Marine landform units are characterized by a sloping topography with a slope of 0-2% with a height difference of less than 5 meters. The relief is flat-sloping, the morphology of the coastal plain, the coastal slope is 3°. Tarupa Island has a beach that stretches along

the island, and at some points there are small abrasions which indicate the control of sea water over the landform

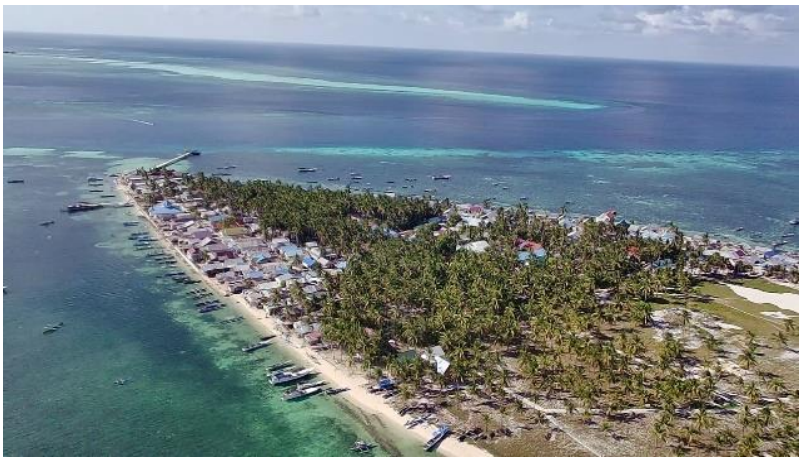

Fig. 9. Tarupa Island

6. Nane Polassi Island

Marine landform units are characterized by sloping topography on the shoreline, and there are cliffs with a slope of 70-90%. Flat beach relief, coastal plain morphology, beach slope 2°. This island has its own characteristics with the presence of igneous rocks that stretch along the coast, with steep cliffs. However, there is also abrasion along the coast by sea water.

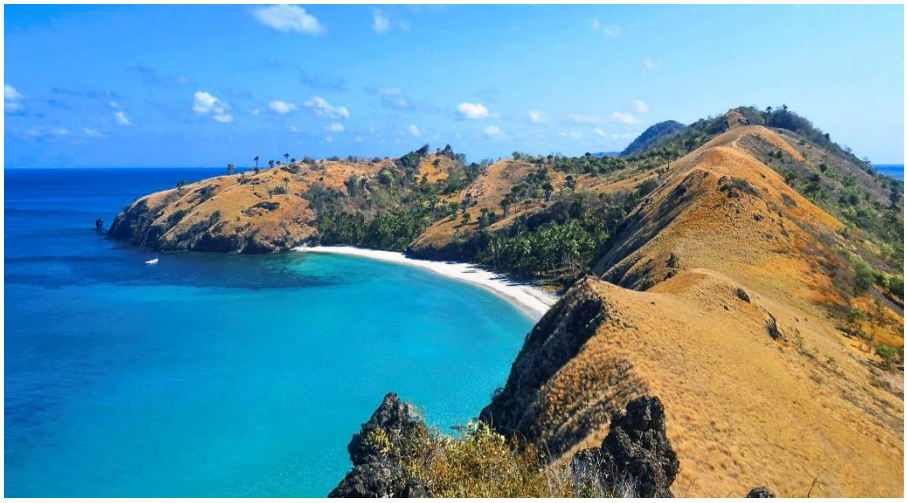

Fig. 9. Nane Polassi Island

7. Bitombang old village

Denudational landform unit, characterized by weathering and soil thickness of more than 2 meters. The slope of the slope is 14-20%, the relief is wavy, the morphology of the hills, the slope is 17°. This location is controlled by weathering both chemically, physically

and by living things around which make denudational markers, with the area composed of sandstone, making it very possible for erosion to occur.

Fig. 10. Bitombang old village

8. Jammeng Waterfall

Denudational landform unit, characterized by high weathering and a soil thickness of more than 2 meters. The slope of the slope is 21-55%, the relief is steep-sloping, the morphology of the hills is steep, the slope is 32°. This location has a waterfall that is arranged in stages, with very dense vegetation, brownish gray soil color, with a thickness of 2-3 meters making this location a denudational landscape

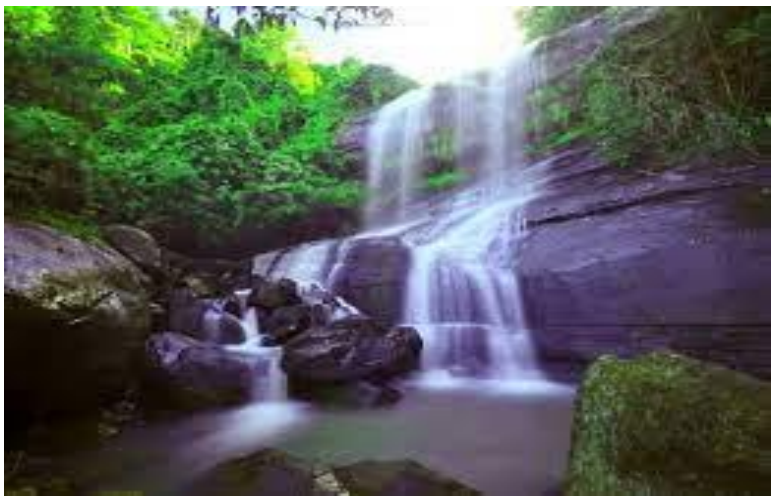

Fig. 11. Jammeng waterafll

4. Conclusion

The results showed that the lithology found was limestone in the Bahuluang Beach area, Tinabo Island, Jinato Island, Latondu Island, and Tarupa Island, sandstone lithology was found in two areas, namely in Bukit Kampung Tua Bitombang, and porphyry basalt lithology in the Nane Polassi Island area. . Geomorphological units that are found include Denudasional hill units and Marine units. The geological structure found is a shear joint on Nane Polassi Island with a minimum stress direction of N285°E and a maximum stress of N15°E. The unique and distinctive diversity of the geological and geomorphological potential of the Selayar Islands supported by the richness of marine life and community culture makes the Selayar Islands very worthy of being developed as a geotourism area

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