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**STUDY OF GEOLOGICAL FEATURES, CULTURAL DIVERSITY AND LIFESTYLE IN THE DEVELOPMENT OF GEOTOURISM IN MUARA DISTRICT, NORTH SUMATERA**

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**ABSTRACT**

Tourism is multi-sector industry that continues to grow and an important aspect that contribute towards economic growth, especially in Indonesia. One type of tourism that is currently popular is geotourism. Geotourism aims to improve the geographic characteristics of a place, such as environment, culture, aesthetics and welfare of its inhabitants. In addition, there are needed of concepts in the development of Geotourism, which is distinctiveness. Distinctiveness itself is an aspect that creates interest between a tourist location and its visitors. One of the factors affecting distinctiveness in a place that is the uniqueness of the destination itself. Uniqueness can affect the image of a tourist spot by providing unique experiences to the tourists, which include culture, lifestyle and geological features. Muara District is one of the tourist attractions located around Lake Toba and has great potential as a geotourism object in North Sumatra. However, the existence of Muara District is still not prominent when compared to the other tourism spots around Lake Toba. Therefore, this study was conducted to examine the uniqueness of Muara District using a mixed research method, where data collection was through observation, interviews and questionnaires to more than 100 respondents. The results showed that the uniqueness of Muara District was still less prominent, which was caused by the lack of promotion and cultural activities in the place, as well as the lack of cleanliness at the tourist attractions in Muara District.

**KEYWORDS:** Distinctiveness, Geotourism, Uniqueness

**INTRODUCTION**

Tourism is a multi-sector industry that continues to grow every year and provides the largest contribution to national economic development, especially in developing countries such as Indonesia (Ginting & Wahid, 2017). One type of tourism that continues to grow and lately has become popular is geotourism.

Geotourism is a form of tourism that aims to improve the geographical character of a place, including its environment, culture, aesthetics, heritage, and the welfare of its inhabitants (Ólafsdóttir & Tverijonaite, 2018). Geotourism is one of the branches of sustainable tourism that focuses on minimizing the impact on the environment and seeks to preserve existing culture to make a certain place different from others (Ólafsdóttir & Tverijonaite, 2018).

In an effort to create a certain place to be 'different' from others, one thing that needs to be done is to improve the identity of that place. Place identity is related with the result of human responses to the changes of the physical environment in order to maintain a relationship with a place and its existence roots in many forms, such as tangible and intangible, and it also contributes to the identity of its society (Ginting & et al., 2019). There are four principles of place identity, one of which is distinctiveness. Distinctiveness itself means a place that can be distinguished from other places because of its own uniqueness (Ginting & Wahid, 2017).

Distinctiveness is an aspect of place identity that creates interest or involvement between a place and tourists so as to create an unforgettable experience (Ginting & Wahid, 2017). One of the factors that support the distinctiveness of a place is the uniqueness of the place itself. With the uniqueness, a destination can create its own image and influence tourists with memorable and unique experiences (Kim, 2014). These unique experiences come from objects or features in a place, such as nature, culture, history and lifestyle (Truong, Mothe & Lenglet, 2017). These elements contribute to influencing tourists to recognize and remember the place.

Muara District is located in North Tapanuli Regency and is located at the edge of Lake Toba, which is one of Indonesia's Geotourism areas. With Lake Toba which has just been appointed as a UNESCO Global Geopark, and its location on the edge of Lake Toba, Muara has great potential to become a geotourism object in North Sumatra. However, the uniqueness of Muara has not been as prominent as other destinations around Lake Toba so that the place does not have a strong image and causes Muara District to be less recognized by the wider community. The application of the uniqueness concept to the development of geotourism in Muara will be able to highlight the image of the area while maintaining the sustainability of the area.

In previous researches, entitled "Geotrail development to connect the dots in Muara Caldera Toba, Indonesia" (Ginting & Siregar, 2018), the geotrail development that connects tourist attractions has been studied and has studied the attraction elements in Muara District. There are also several studies that discuss aspects of distinctiveness and geotourism, such as in a journal entitled "Developing tourism facilities based on geotourism in Silalahi Village, Geopark Toba Caldera" (Ginting & Sasmita, 2018), "More Attractive More Identified: Distinctiveness in Embedding Place Identity" (Ginting, Nasution & Rahman, 2016), and "Geotourism A Systematic Literature Review" (Ólafsdóttir & Tverijonaite, 2018). However, researcher found that research related to geotourism and its uniqueness in Muara District was still limited. Therefore, the purpose of this research is to try to assess the

uniqueness of the Geotourism in Muara and the results of this study are expected to be useful for the society as well as on further research activities related to tourism in Muara.

## **2. LITERATURE REVIEW**

### **2.1. Geotourism**

Geotourism is natural diversity that focuses on landscapes to promote geological sites and learning through environmental conservation (Ginting & Sasmita, 2018). Management in the geotourism area also provide some benefits to the community. Geotourism development must meet several requirements, such as geological-based, sustainable, educational, community participation and tourist satisfaction (Ginting & Sasmita, 2018).

There are five basic principles (variables) in geotourism, namely geo-tourism based on geology (based on the geology of the earth), sustainable (for example, economically feasible, improving community and encouraging maintenance of geoconservation), educative (achieved through geo-interpretation), locally beneficial, and generating tourist satisfaction. The first three characteristics are considered important for a product that is considered 'geotourism', while the last two characteristics are seen as desirable for all forms of tourism. (Dowling, 2010). These five things can be obtained through geological features at tourist sites, the use of geotrails and viewpoints found at tourist destination (Dowling, 2013).

One of the facilities that can be used to develop geotourism is to use a geopark, which defined by UNESCO as an integrated geographical area where there are geological sites that are managed with a holistic concept of protection, education, and sustainable development (Ólafsdóttir & Tverijonaite, 2018). The steps required for geopark formation and getourism development are identification of the geoheritage of each region and maintenance of geosites and geomorphosites from the area (Hose et al, 2011; Ólafsdóttir & Tverijonaite, 2018)

### **2.2 Distinctiveness**

Distinctiveness is part of a theory of place identity, which is developed by Breakwell in 1993. Distinctiveness associated with a positive perception of the uniqueness of a place and is something that is visible from the appearance, the value of social experiences, and culture will always be remembered by someone (Ginting & Wahid, 2017). With clear distinctiveness, a place will be more attractive to tourists. Conversely, if a place does not have a certain uniqueness and character, it will result in the place being quickly forgotten because there is nothing interesting for tourists (Ginting, Achmad & Vinky, 2016).

There are 4 variables that can be used to investigate the distinctiveness of a place, one of which is the uniqueness of the place itself (Ginting & Wahid, 2017). The uniqueness influence on people's perceptions of cultural diversity in the region and interesting cultural activities. Uniqueness also affects people's perceptions of the diversity of local products found in one place. ( Ginting, Achmad & Vinky,

2016). In addition, according to Truong (2017), the natural conditions and lifestyle of local communities have an effect on the uniqueness of a tourist destination, where these elements contribute to influencing tourists to recognize and remember the place.

### 3. RESEARCH METHODS

#### 3.1 Research Sites

The research location is located in Muara District, which is part of North Tapanuli Regency, North Sumatra. Muara District has an area of 79.75 km<sup>2</sup> with the division of the area into 15 Villages and has a population of 14,054 people (BPS Kabupaten Tapanuli Utara, 2017).

Muara District was chosen as the research location because Muara is one of the tourist attractions around Lake Toba, where Lake Toba was recently named one of the UNESCO Global Geoparks in 2020. In addition, Muara District is still poorly recognized by the wider community even though the place is rich in natural beauty and culture. Several tourist sites in Muara District that will be studied are Huta Ginjang, Sibandang Island, Dolok Martumbur Village, and Muara Geosite.



**Figure 1. Location of Muara District (Source: Google Maps)**



**Figure 2. Tourist Spots in Muara District (Source: Google Maps)**

### 3.2 Research Method

The method used in this research is mixed method research, which is a research approach that collects sequential quantitative and qualitative data which are then combined, assuming that collecting various types of data can provide an understanding of the research problem. The study began with a survey is broad to draw conclusions from a population, then focused in detail and in a second phase (qualitative) open interviews conducted to gather detailed views of the participants ( Cresswell, 2012).

The use of mixed research aims to make the data collected more complete according to the research needs and the information required to obtain more detail.

In this study, the necessary information was collected first through distributing questionnaires online to more than 100 respondents with a ratio of 50:50 (local people to tourists), where questionnaires were distributed from April 23, 2020 to May 1, 2020, where according to Hair et al (2010) stated that the appropriate sample size in a study is 100-250 people. Data collection through questionnaires was given to respondents with the following criteria:

1. Are tourists who have visited tourist attractions in the study area
2. Is a local community in the study area

There are several variables that will be tested in this study, where the tested variables are the result of a cross between the sub-variables from the uniqueness aspect and the sub-variables from the geotourism aspect, which are then formed a statement that will be included in the questionnaire.

**Table 1: Sub – variable research**

Sub-Variabel	Indicator	Parameter	Statement
Geological-based study of the uniqueness	The uniqueness of the tourist spot is supported by the geological condition of the place	The existence of unique tourist attractions because it is supported by the geological conditions around the destination	The uniqueness of tourist attractions is supported by the geological conditions around the tourist area
The study of uniqueness with the concept of sustainability	The people's lifestyle does not reduce the quality / condition of nature in the tourist area	The people's lifestyle does not reduce the quality / condition of nature in the tourist area	The people's lifestyle does not reduce the quality / condition of nature in the tourist area
Study of uniqueness which are related to "locally beneficial"	Cultural diversity in tourist areas is beneficial in economic development	There are benefits in terms of economic development based on the cultural diversity of tourist areas	Cultural diversity in Muara District is one of the factors for tourists wanted to visit Muara.
	Natural conditions in tourist attractions are beneficial to society in the economic field	There are benefits in the economic sector based on the natural conditions around the area	The geological condition in Muara District is one of the factors for tourists wanting to visit Muara.
Study uniqueness which are related to tourist satisfaction	Cultural diversity at tourist attractions is in accordance with visitor expectations	Cultural diversity at tourist attractions is in accordance with visitor expectations	Cultural diversity in tourist attractions is in accordance with expectations

The variables obtained will then be formed in 5 questions which will be included in the questionnaire, and will be answered by the respondent based on predetermined criteria. The results of the questionnaire are in the form of the average value of the answers given by respondents who are tourists and local people, where respondents who strongly disagree with the statement will give a value of 1, disagree by giving a value of 2, neutral with a value of 3, agree with value 4 and strongly agree with the statement gives a value of 5. The conclusion of the quantitative results is to compare the value of each variable and the average value obtained from the results of the respondent's answer, with a note that the variable value is below the average value will be considered insufficient or still considered not approved by the respondent. Collecting data through this questionnaire aims to obtain information about tourist perspectives on the uniqueness of Muara District.

In the next stage (qualitative method), the necessary data will be collected through observation and through interviews with 6 key informants in the form of academics, community leaders, tourism leaders and 3 people from the government in Muara District. The data that has been collected through

qualitative and quantitative will then be linked and used to answer the problems facing tourism in Muara District. Observations were made with the aim of clarifying the results of the questionnaire with the conditions at the tourist location and interviews were conducted to obtain information about tourism in Muara District.

### 3.3. Data Analysis Method

Quantitative data that has been collected through a questionnaire is processed to obtain the average value of the Likert scale of the respondents, then linked to the results of qualitative data obtained from observations, and interviews with informants. Results from three of these activities will be linked with one another in order to obtain a conclusion that will be used to get answers of the issues related to the aspect of the uniqueness of the development of Geotourism in the estuary (Fig. 3).

#### Analysis Method

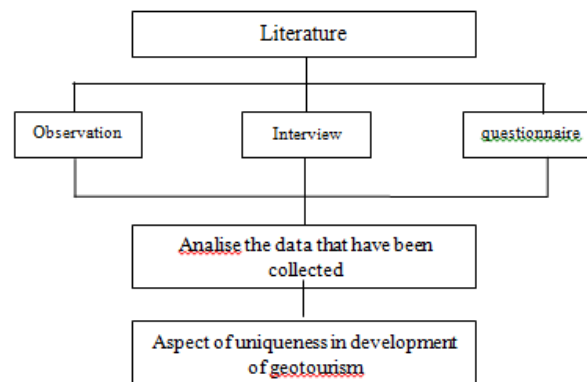


Figure 3. Data Analysis Method

The analysis process is carried out by categorizing the mean or average value of the respondents' assessment through a questionnaire in the study area. Determination of category classes can be done by looking for intervals using the interval formula (Sutrisno, 2004) as follows:

$$I = \frac{\text{Range}}{\text{Number of Intervals}}$$

Number of Intervals

Where the number of intervals specified is 5 and the range specified from the Likert Scale is:

R = Highest value - Lowest value  
Literature Observation Interview questionnaire Analyse the data that have been collected Aspect of uniqueness in development of geotourism

$$R = 5 - 1$$

$$R = 4$$

Then it can be calculated the width of the interval using the formula above as follows:

$$I = 4/5 = 0,8$$

After the width of the interval is known, this value can be used to limit the answer categories to very low, low, moderate, high and very high categories.

**Table 2: Research Data Interval**

Category	Value Range
Very Low	$1 \leq x < 1,8$
Low	$1,8 \leq x < 2,6$
Enough	$2,6 \leq x < 3,4$
High	$3,4 \leq x < 4,2$
Very High	$4,2 \leq x \leq 5$

## 4. RESULT AND DISCUSSION

### 4.1. Questionnaire Results

From the results of distributing questionnaires (n = 108), the majority of respondents were around 20-25 years old (59.2%), followed by respondents aged 26-30 years (18.6%). Respondents to the questionnaire were dominated by women (57.4%) while men (42.6%).

The results of the questionnaire showed that the respondents' perceptions of the uniqueness in Muara Regency were good with an average value of 3.8 (Table 2). Based on the results of the study, respondents were quite impressed with the tourist destinations in Muara based geological (Mean = 3.9) and states that the geological conditions is the main reason tourists want to visit Muara (Mean = 3.9).



**Table 3: The result of questionnaire**

No.	Statement	Score by tourists	Score by residents	Mean
1.	The uniqueness of tourist attractions is supported by the geological conditions around the area	3,8	4,0	3,9
2.	The geological condition in Muara District is one of the factors for tourists wanted to visit Muara	3,8	4,0	3,9
3.	Cultural diversity in tourist attractions is in accordance with expectations	3,4	3,8	3,6
4.	Cultural diversity in Muara District is one of the factors for tourists wanted to visit Muara	3,4	3,9	3,65
5.	The people's lifestyle does not reduce the quality / condition of nature in the tourist area	3,8	4,1	3,95
Average		3,6	4,0	3,8

1 = Strongly disagree 5 = Strongly agree

According to the key informant, this is due to the existence of Lake Toba and Sibandang Island, which are the main attractions of tourists visiting Muara Regency

*“Lake Toba is one of the famous tourist destinations in North Sumatra. With the existence of Lake Toba, the area around Lake Toba is also become a tourist destination, such as Muara District.”* (Key informant: Toba Caldera Geopark Agency).

This opinion is also justified by the tourists, where tourists claimed that the main factor, they visited Muara District is the natural beauty of the place, especially the beauty of Lake Toba and Sibandang Island, where the Sibandang Island is the second largest island in Lake Toba and an 'object' that is easily recognized by tourists.

**Figure 4: (A) Sibandang Island, (B) Lake Toba**

The beauty of Lake Toba can be seen from several places in Muara District, such as Huta Ginjang, Dolok Martumbur Village, Muara Geosite and also from Sibandang Island.



Figure 5: View in Muara District

From the observations, there are also several unique geological features in Muara District besides Lake Toba and Sibandang Island. These geological features are relics from the post-eruption of a volcano 74,000 years ago known as the YTT (Youngest Toba Tuff) supervolcano (Ginting & Siregar, 2018). The post-eruption heritage site is known as the Toba Caldera, which is one of the largest volcanic craters in the world, measuring 100 x 30 km, where the steep part of the crater is Lake Toba which is the largest volcanic lake in the world (Chesner, 2012). In Muara District, there are several locations which are geosite areas of the Toba Caldera, including Huta Ginjang, Muara Geosite, Dolok Martumbur Village and Sibandang Island (Fig. 6). There are relics in the form of ancient rocks which are estimated to be 250 million years old which are located in Dolok Martumbur Village.



Figure 6: Geosite location in Muara District

However, these geological features are still poorly recognized by the wider community, where the cause is the absence of promotion and placement of panels containing information about these geological features. So that the majority of the reasons for tourists visiting Muara District are due to the natural beauty of Muara District without knowing the value of these geological features. Therefore, the need for development in the form of laying panels and promotion of these geological features so that they can be recognized by the wider community and can even be useful for tourists visiting Muara District in obtaining information about these geological features. In addition, the preservation of these geological features will be useful in the development, management and planning of geotourism itself (Dowling, 2010). Another solution is the training provided by the local government to local communities in Muara District. This training can be in the form of guidance / learning to local people about geological features in Muara District, this will benefit local communities, by providing livelihoods such as tour guides, so that apart from these panels, tourists can also get information about features. geologists in Muara District through local communities.

In addition, in the results of the questionnaire, Residents agree with the statement that cultural diversity in tourist attractions is in accordance with expectations (Mean = 3.8). According to community leaders in Muara District, apart from its geological condition, Muara District is also famous for its culture.

*"... Apart from its natural beauty, Muara is also famous for its culture, such as traditional houses, ulos activities and traditional dances ..."* (Key Informant: Community leaders in Muara District).

Based on observations, there are several cultures that still exist in Muara District, including the Ulos weaving culture and the Hoda - Hoda traditional dance (Fig. 7). Both of these cultural activities can be found on Sibandang Island where in Papande Village, tourists can see firsthand the ulos weaving activities carried out by local people. However, traditional dance activities are still rarely found, because these dances are only performed on certain events.



**Figure 7: Cultural activities in Muara District**

This is why the statement was not approved by tourists who visited Muara District, which gave a Mean = 3.4. According to some tourists, cultural diversity in Muara District is still less prominent, especially through its cultural attractions. This is in accordance with the opinion of tourists regarding the statement that cultural diversity in Muara District is one of the factors for tourists wanted to visit Muara, where tourists do not agree with the statement (Mean = 3,4). With the conclusion that the culture in Muara District is still considered lacking by tourists. According to North Sumatra tourism figures this is due to the lack of promotion and lack of cultural attractions in Muara District and resulting in less prominence of culture in Muara District so that it is less recognized by tourists.

*".. For culture in Muara, there is nothing that stands out, for Tenun Ulos it can be found in other places besides Muara, this is a result of the absence of branding originating from Muara so that it is less recognized by the community, for traditional dances it is also rare, so the wider community don't know about the dance ..."* (Source: North Sumatra Tourism Leader)

To overcome this problem, the Head of BPODT stated that there are several strategies so that culture in Muara District is more recognized by tourists, namely by increasing promotion through cultural events and adding attractions such as sports activities to attract tourists to visit Muara District.

*".. By adding attractions in the field of sports as well as promotion through cultural events, or it could be imitating tourism in Bali where tourists can learn about Ulos weaving crafts directly at tourist attractions, where Ulos Weaving activities are located on Sibandang Island ..."* (Informant: Chairman of BPODT).

According to the informant, imitating tourism in Bali, such as providing experiences for tourists to make Ulos, can provide benefits for tourists in the form of unique experiences and provide benefits for Muara District to increase tourist visits through its cultural uniqueness. This strategy is in accordance with the uniqueness theory where there is uniqueness so that a tourist attraction can form its own image and influence tourists with memorable and unique experiences (Kim, 2014).

In the results of the questionnaire, respondents agreed with the statement that the people's lifestyle was good and did not reduce the quality / natural conditions in the tourist area (Mean = 3.95). This is in accordance with the opinion of community leaders in Muara District who stated that the environment in Muara District is very clean, which is supported by the livelihoods of local communities in Muara District that do not damage the environment.

*"... for the environment in Muara it is clean and maintained, this is due to the livelihoods of local residents who do not pollute the environment, cleanliness can be seen from tourist attractions in Muara .."* (Informant: Community Leader in Muara District).

From the observations, the environment at the tourist attractions in Muara District looks clean and its natural conditions are still preserved. However, there are also areas that are not clean, such as in Figure 8A which is a route in Papande Village, Sibandang Island, where there is rubbish on the side of the road.



**Figure 8: Environmental condition in Muara District**

Maintaining cleanliness in the environment in Muara District is in accordance with one of the theories on geotourism where a geotourism site must be sustainable, where in this case it can be seen that Muara District has implemented one of the sustainable concepts, namely environmentally sustainable by protecting the ecosystem in tourist destinations (Qodriyatun, 2018), however, there is still a need to improve the cleanliness of some tourist attractions in Muara District, such as scattered garbage which affects the perception of tourists about the cleanliness of the place. Cleanliness at tourist attractions will affect tourist satisfaction with the place, where tourist satisfaction is an important aspect that influences tourism development and greatly influences tourists' decisions to recommend these tourist attractions to others (Weaver & Lawton, 2014; Yuliana, 2018).

Based on the results of this study, it can be concluded that the uniqueness in Muara District is good, but the cultural activities in Muara District are still considered lacking by tourists, so that a strategy is needed in the form of adding cultural attractions in Muara District so that the uniqueness of the place is more prominent. To facilitate understanding of the research that has been carried out, the researcher made tabulations that were tailored to the solutions obtained based on the research results (Table 4).

**Table 4: Conclusions from the study**

No.	The uniqueness aspect of geotourism in Muara District	Problems with the feature	The solution obtained from the research results
1.	Geological Features	The lack of recognition of geological features in Muara District, such as remains of post-volcanic eruptions ( <i>YTT supervolcano</i> ).	Laying out a panel board that contains information about YTT's heritage locations in Muara District and increases promotion of these features. This can be done by the local government and local communities, providing training to local people so that they can become <i>tour guides</i> so they can participate in promoting these sites.
2.	Culture	Lack of cultural activities in Muara District, so that it is less recognized by tourists.	Adding cultural activities and promoting cultural events to the wider community. This can be done by the local government by actively promoting culture in Muara District.
3.	Lifestyle	There are places where cleanliness is still lacking.	Improving cleanliness at tourist attractions, can be done by the local community and the local government by providing directions in order to increase tourist visits in Muara District

**5. CONCLUSIONS AND RECOMMENDATIONS**

Uniqueness is a variable that supports distinctiveness of a place. With their uniqueness, a tourist attraction can make its own image and affect travelers with memorable and unique experiences (Kim, 2014). Some of the components of the uniqueness studied are lifestyle, culture and geological features.

Based on observations, there are several distinctive features of geological which adds to the uniqueness in Muara District, as the result of a volcanic eruption super volcano in Huta Ginjang, Muara Geosite and Sibandang Island and there are ancient rocks in the village of Dolok Martumbur that are estimated more than 250 million years old. However, these features are less recognized by travelers due to a lack of promotion and no information panel. In addition, from the results of questionnaires and interviews with key informants, it can be concluded that Muara District is still lacking in cultural activities so that it is less well known by the wider community. Therefore, a strategy is needed for Muara Regency by increasing its cultural activities to make it more prominent. Cleanliness also needs to be improved in several places in Muara District which will be beneficial for Muara Regency to create tourist satisfaction.

From the results of the research that has been carried out, it can be concluded that in a tourism, especially geotourism, there are needed features that can help the tourism to be more prominent, such as geological features and cultural features. Geological features can be enhanced in various ways, such as the maintenance of tourism sites. Maintenance of tourism places can increase tourist satisfaction which can be useful for the tourism site itself in the future. In addition, cultural features can be enhanced through cultural activities at tourist attractions. Cultural activities can increase the identity of the place from the tourist location itself, where the identity of the place will be very useful for these tourist attractions to be more recognized by the wider community.

The results of this study can be used as input to improve the quality of tourism in Muara District. Further research is recommended to be carried out by visiting the research location directly, where in this study, the researcher only collects the necessary information through digital media and the data that has been collected is still lacking in detail. This aims to make problems in geotourism in Muara District more visible and can be more useful for the development of geotourism in Muara District in the future.

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## Author Profile



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