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Implementation of physical environment of sustainable tourism based on tourism village. *Case study: Situngkir Village.*

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Abstract. The development of the environmental element, which is a component of Sustainable Tourism, becomes a foundation in developing sustainable tourism in Toba Lake. Study of the application of environment's physic is needed to keep the environment of Toba Lake well maintained so that it provides the needs of the present while ensuring the options still being preserved for future. Pangururan, the capital of Samosir Island, consists of several villages that can be developed into Tourism Village, one of which is the Situngkir village. The attraction which exist in Situngkir Village, Pasir Putih Situngkir, has the potential to increase the number of tourists traveling to the village. Meanwhile, the main cause of this beach being unvisited is because of the untreated condition. The purpose of this research is to develop environment-based Sustainable Tourism to increase the number of tourists and to maintain sustainability in the village. This research uses the mixed method, combining the elements of environment and tourism village followed by direct observations, questionnaires distribution, depth interviews with five key respondents, and interviewing stakeholders in the area. The result shows that there is a lack of public awareness of environmental hygiene that can affect the quality of tourist attractions, as well as lack of facilities to maintain the cleanliness of the environment. Therefore, it is necessary to educate the surrounding community about the importance of quality in a tourist attraction, the provision of adequate facilities, and the need of support from stakeholders in maintaining environmental sustainability in Pasir Putih Situngkir.

Keywords: Tourism, Situngkir, Sustainable Tourism, Environmental Sustainability, Pangururan.

1. Introduction

Tourism is one of the economic generators today, especially for developing countries [1]. The emergence of tourism as a global industry in national and regional growth is followed by the increased awareness of governments which lead to contribution in providing economical and social progress for local communities in tourism [2]. In those progress, the tourism sector are expected to maintain the sustainability and preservation of environmental ecosystem that does not neglect the social and cultural condition of society [3] while at the same time can handle the needs of visitors, community, industries and the environment so that it can be maintained and enjoyed by the upcoming generations [4].

One of the tourism destinations in Indonesia that need to apply the sustainable tourism concept is Lake Toba. Currently, three districts can develop tourism in Samosir Island, one of which is Pangururan



District. Situngkir is one of the villages in Pangururan district, and it has a natural attraction, Pasir Putih Situngkir also known as Pasir Putih Parbaba. Normally beaches have the view of oceans, but Pasir Indah Situngkir is a coastal lake that is formed naturally with white sand along the coast of the beach so the visitors will enjoy the scenery of hills surrounding Lake Toba, not the usual expanse of ocean in general. But in fact, the environment in Pasir Putih Situngkir seemed untreated and unorganized. Many garbages are scattered all around, and the water in Lake Toba is polluted. Given the potentials and the problems existing in Pasir Indah Situngkir, it is necessary to review the implementation of physical environmental elements in the area to maintain its sustainability. Though the other elements of sustainable tourism, such as socio-culture, economy and government are as important as environment element, this paper discusses the approach of the physical environment element from sustainable tourism only. The limitation of discussion is done to preserve and maintain the sustainability of rural-based tourism environment.

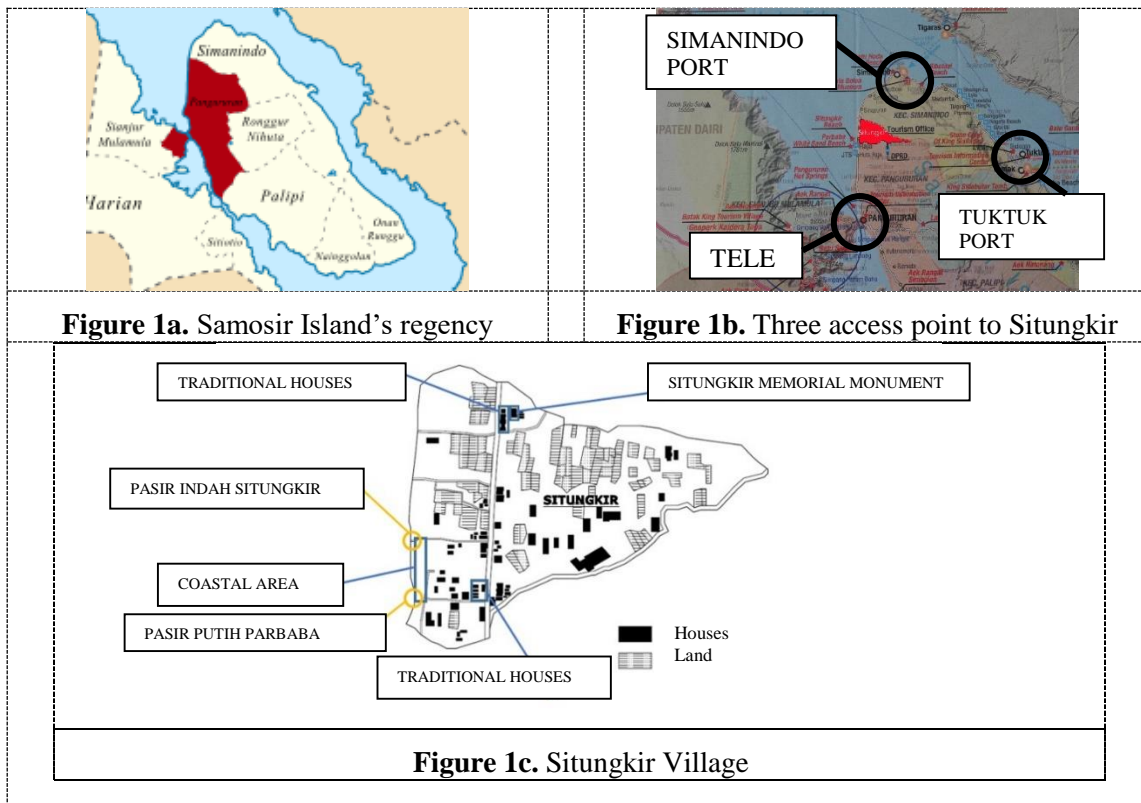
2. Sustainable Tourism, Physical Environment, and Rural Tourism.

Tourism is a whole series of traveling activities undertaken by tourists from their origin to other temporary destinations with the intention of not to settle or to earn a living, but only to satisfy the curiosity or to spend leisure time or for other purposes [5][6]. The tourism sector has developed rapidly in which the development and new investments should be in no adverse impact and can blend with the environment. Therefore, the concept of sustainable tourism is introduced by WCAD in 1987, who stated that sustainable tourism is a part of the sustainable development. The concept is achieved if the environmental, community and economic values are balanced and is solved through collaboration and compromise in achieving sustainable tourism levels[7] by developing sustainable tourism in the economic, environmental and social-cultural sustainability [8].

Environmental sustainability is affected by four aspects [9]; Physical Conditions, the physical things or facilities in the area such as pedestrian paths, public facilities [10]; Physical Integrity, the continuity of such physical things like the distance; Biodiversity, the uniqueness in the area; and Waste Management and Resources [11]. The implementation of environmental aspects should be based on the determinants of rural tourism where management is required to achieve the desired objectives by considering all resources it has [12]. The concept of developing rural tourism includes; accommodation (residences of locals or the units to be rented developing in the same way as the local's traditions), attractions (all the daily life of the local people along with the physical location of the village that allows tourists as active participants), accessibility (availability of infrastructure or public services) [13], rural authenticity and social circumstances that reflect the village's life [14], as well as the typical village's spatial arrangement [15].

3. Methodology

The choice of the research's location refers to the concept of sustainable tourism which prioritizes the environmental elements that do not ignore the social aspects of local culture, has the purpose of contributing to shareholders in the economic sector [16]. Therefore, the researcher chose Pangururan district (Figure 1a) which has various potential villages to be developed into tourist destinations, one of which is Situngkir Village. Situngkir is a village with an area of about 6 km² with a population of 416 people. There are three main access points for accessibility to Situngkir Village which are Simanindo port, Tuktuk port and Tele (the intersection point between Samosir Island and Sumatera Island) (Figure 1b). There are several potential attractions in Situngkir village, one of which is the natural attraction. Pasir Indah Situngkir and Pasir Putih Parbaba is a 250 m long coastal corridor located along from Situngkir village to Siopat sosor village (Figure 1c). The community utilizes the natural attraction by making artificial rides or attraction.



This research uses the mixed method which combines qualitative and quantitative methods [17]. This method is the most appropriate to examine the development of rural tourism based on sustainable development as the researcher want to explain the perception of the community and tourists factually regarding the development of rural tourism in the area. Researcher distributed the questionnaires in various places in the village of Situngkir, such as Pasir Indah Situngkir, Pasir Putih Parbaba, the memorial monument of Situngkir, and around the household in Situngkir. 40 of the questionnaires are distributed to the locals and 40 to tourists to justify their perspectives to the environmental elements of sustainable tourism in Situngkir village.

Table 1. Analysing Methodology

Environmental Rural Tourism	Physical Conditions	Biodiversity	Waste Management and Resources	Physical Integrity
Attraction	●	●	●	●
Accommodation	●	○	●	●
Social Life	●	○	●	○
Rural Authenticity	●	○	○	○
Accessibility	●	○	○	●
Spatial Planning	●	○	●	○

* ● related ○ no relation

The environmental variables used in this research are the Physical Conditions variable based on the indicators of the rural tourism, which is attraction, accommodation, social life, rural authenticity, accessibility and Spatial Planning (Table 1).

Table 2. Variable and Indicators

Indicators	Variables
Uniqueness of Attraction	Attraction
Fulfilling	
Amount of Attraction	

Quality of Attraction	
Safety of the Attraction	
The uniqueness of the transportation	
Quality of accommodation	Accommodation
Amount of homestay	
Social Life	Social Life
Creativity	
Origin Festive held	Rural Authenticity
Easiness	
Safety	Accessibility
Signs	
Public Facilities	Spatial Planning

4. Analysis and Interpretation

Out of 80 questionnaires distributed, most of the respondents were men (58%), and the rest were female (42%). Meanwhile, the age of the respondents most ranges between 26–40 years old (52%), followed by 20% of 41-55 years old, 18% of > 55 years old and only 10% was 18-25 years old. Respondents are mainly locals (57.5%) with the rest of it being tourists, which shows the number of tourists visiting the village is still low, causing a disproportion (it should be 50% to 50%).

4.1. Physical Condition of the Attraction

The physical condition of the attractions in the village (both natural attraction and socio-cultural attraction).

Table 3. Questionnaire's Result for Situngkir village's physical environment of attraction

No.	Statement of Attraction	Locals	Tourists	Average Value
1.	The architectural building in the village is unique	3.675	3.1	3.39
2.	Satisfaction of the existing environment	2.825	2.45	2.64
3.	The amount of attraction in this village is enough	3.7	2.425	3.06
4.	The quality of the attractions has been good	3.525	2.65	3.09
5.	The artificial rides are safe	3.8	3.2	3.5

According to both locals and tourists (Table 3, 1), Situngkir village has implemented a development based on the local culture with the existence of rows of traditional Batakese houses (Figure 2). However, the row of traditional houses as observed, are still not well-maintained and not neatly arranged and looks dirty thus reducing the interest of tourists to explore further. The typical traditional houses need to be preserved regarding their patterns and custom settlements with the traditional aspects which is hereditary so that it does not reduce the authenticity of local cultural values [18].



Figure 2. Rows of traditional houses



Figure 3. The abandoned land

The locals are not satisfied (Table 3, 2) and felt not facilitated by the government. However, according to the interviews with an academic, both the locals and government have been doing their best to prepare Situngkir. The problem is the lack of promotions or involvement of third parties. Also, this village

needed a background story of its own to make it even more meaningful to be visited. The packaging of a tourist attraction plays an important role in deciding the tourist destination as it can create a positive image, satisfaction, and loyalty of the tourists to revisit the place [19]. Tourists need more attractions while locals do not think so (Table 3, 3). The local community considers natural attraction (Figure 4) is enough to attract tourists while according to the tourists, other attractions such as cultural attractions, for example, should also be in the village. The development of tourism should be a comprehensive one such that it obtain optimal benefits for society, both in economic, social and cultural [20].



Figure 4. Natural attraction in Situngkir village



Figure 5. Artificial rides



Figure 6. Hotel in Situngkir alongside the beach

4.2. Physical Conditions of the Accommodations

Accommodations include the transportations and the hostelry of the destination.

Table 4. Questionnaire's result of Accommodations in Situngkir

No.	Statement of Accommodation	Locals	Tourists	Average Value
1.	There are hostelry or homestay in Situngkir village	3.475	2.925	3.20

There are two homestay houses and some hotels near Pasir Indah Situngkir. However, most of the tourists were staying in Tomok area and only visited during the day. There have been many hotels and inns along the beach, but the tourists are not willing to stay there as they consider the facilities of inns in the village are still inadequate compared to hotels in Tomok. As for homestay, the tourists do not know of the existence whereas homestay is a supporting factor in the rural tourism. Homestay is a facility for tourists where they can live with the local families and do the daily routines. Moreover, it can directly encourage the community to be proud of their tradition [21]. Also, there is still no unique design of public transportation in Situngkir. The public transportation available is rentable motorbike. It is one of the important clues in terminating tourist destinations undertaken by tourists and it should be easily accessible by tourists [22].

4.3. Physical Conditions of Social life

The life of the community related to tourism, such as the local products and the local souvenirs that shows the social and cultural value of the village.

Table 5. Questionnaire's Result of Social Life in Situngkir

No.	Statements of Social Life	Locals	Tourists	Average Value
1.	The creativity of the locals in processing local products	3.725	2.275	3.00

The locals are considered less creative in processing their local products, peanuts. However, souvenirs sold by the community are considered attractive and shows the characteristics of Batakese and Lake Toba (Figure 6). The forms of the creative economy always come up with a distinctive added value, creating their market and successfully obtain income. The creative process of making souvenirs can also be an attraction that can add to the value of Situngkir [23].

**Figure 7.** Local souvenirs**Figure 8.** Pasir Putih Festivals**Figure 9.** Access to Pasir Indah Situngkir

4.4. Physical Conditions of Rural Authenticity

The authenticity of the rural tourism in the village

Table 6. Questionnaire's Result of Rural Authenticity in Situngkir

No.	Statements of Rural Authenticity	Locals	Tourists	Average Value
1.	There are special events held only in Situngkir	3.45	3.025	3.24

The special event which is held annually is the Pasir Putih Festival in 27 may at Pasir Indah Situngkir. The festival consists of various events, such as Manguras Tao, Kirab Budaya, Tortor Partutuaek Kolosal, Traditional Race Arir, and others. The festival is conducted as a symbolic practice of cleansing and re-purifying to respect the environment of Lake Toba (Figure 8). Cultural festivals are an important communication to build, empower and acknowledge cultural identity [24].

4.5. Physical Condition of Accessibility

Access to the village and natural attraction

Table 7 Questionnaire result of accessibility in Situngkir Village

No.	Statement of Accessibility	Locals	Tourists	Average value
1.	Access to Situngkir is good	4.575	3.75	3.31
2.	Access to Situngkir is easy	3.38	2.850	3.12

Access to Situngkir Village is considered adequate by locals (Figure 9). Good access can increase the interest of tourists to re-travel the tourist attraction. However, the ease to reach Situngkir Village is considered not good enough by tourists (Table 7; 1). It is related to the signs in Situngkir Village. Signposts are considered lacking in number. However, locals think Situngkir Village are easy to reach. According to observations, both opinions from tourists and locals are true. There are no signs indicating tourists have entered Situngkir Village area, but for the board indicating Pasir Putih Parbaba and Pasir Indah Situngkir already exist. Both statements are contradictory, and this is caused by a person's habits. People who lives there will certainly know their places well. The feeling comfort will exist when a person is satisfied with the necessities in an area and so, they can perform an act rationally and efficiently [25].

4.6. Spatial Planning

Spatial planning based on facilities located in Situngkir Village.

Table 8 Questionnaire result of the spatial environment in Situngkir Village

No.	Statements of Spatial Planning	Locals	Tourists	Average Value
1.	Signs that show the way to Situngkir village exists.	3.325	2.5	2.92

2.	There are Tourist information center	2.15	1.95	2.05
3.	The road in Situngkir is good	3.575	3.475	3.53
4.	There are public seats along the road in Situngkir	3.00	2.425	2.71
5.	The pedestrian pathways are clear and good	3.00	2.00	2.5

Information Centre is still not available in Situngkir Village. The information center should be a place to promote the attraction area and potential attraction which is located in the tourist village, also to help the preservation of cultures and traditions and motivate locals to realize the importance of tradition [26]. Both locals and tourists agree that roads in Situngkir Village are good. Easy access to the attraction is an important thing in tourist development [27]. According to observations, there is no seat available alongside Situngkir Village roads, but there are plenty of seats available in Situngkir Village attraction. Alongside coastal corridor, as far as 25 meters from the lake, there are rows of seats and mats available for tourists. However, the seats are not enough, several are broken, and tourists have to pay to sit. In locals' opinion, seats are not necessary to be provided alongside the road. However, in the development of rural tourism, seats alongside the road and pedestrian are very necessary in the future. Seats are one of the public facilities which should be in tourist areas for tourists' comfort [28].

5. Conclusion

Most of the physical condition of the environmental element of sustainable tourism has been freed-well by both locals and tourists. Rows of Batakese traditional houses is rated unique and good by locals and tourists which shows cultures of Situngkir Village is still irrefutable in its environment. Quality and safety of nature (Pasir Indah Situngkir and Pasir Putih Parbaba) and rides in Situngkir Village has improved well. Also, tourists have been visiting the special festival which is held annually in Situngkir Village, Pasir Putih Festival. However, there are several aspects which are still inadequate. The uniqueness and potential in the village should be more highlighted. In addition, the number of attraction in Situngkir Village is also lacking. Social attraction can be developed to be an attraction. Locals and government should help each other to explore and manage the potential in the village. Promotion and investment to attract tourists is still also needed. The introduction story of Situngkir Village should be written and trimmed to increase the interest of tourists. There are still some physical factors that is lacking, such as public toilets, signposts and signboards, pedestrian paths, seating, garbage cans and tourist information center. Government should also review the comfort or hygiene factors in Situngkir's surroundings. With the concept of sustainable tourism, this research is expected to improve the sustainable physical condition in attraction's surroundings, to maximize the contribution of tourism to the prosperity of the destinations and communities in Situngkir Village, Pangururan.

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