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The New Fisher Village in Belawan, Medan with Green Architecture Methods

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ABSTRACT

The existence of coastal areas is overlooked and undervalued. A place that should have good qualities and potential has turned into a slum, with a lot of rubbish, ill inhabitants, and a poor socioeconomic level. Due to the absence of order in the area and the people's less developed standard of living, the river becomes slumpier and eventually floods every year as a result. The Sebrang Belawan Fisherman's Village in Medan is one of the coastal instances. Every year, the average number of residents grows, causing the neighborhood to become increasingly slum due to its lack of organization. Using natural energy and community empowerment in the principles of Green Architecture, the coastal area should be a location for public space that may revive the existence and distinctive culture of the fishing village community. As a result of some of these factors, project planning in this area is undergoing the process of developing Belawan's coastal area using a green architecture strategy to solve the difficulties that exist in this area. The significance of Green Architecture as a strategy for creating environmentally-friendly public spaces and other supporting structures to address issues such as slums, garbage, and a community's low economic status. As a result, this region will show a well-kept village, a vacation destination, and a place with significance in the local community and beyond.

Keywords: Belawan, fisherman village, green architecture

1 Introduction

The daily life of coastal communities cannot be separated from their dependence on coastal resources because their livelihoods depend on the sea. Their livelihood comes from the sea; therefore, they live in coastal areas. The potential of natural resources in various coastal regions attracts people to meet their daily needs, so various coastal settlements have been formed according to the level of community livelihoods. It was also found that this area is unfit for habitation due to a filthy environment and lack of public awareness of cleanliness. The community feels that the upstream region sends the garbage in their place, but the local community throws the waste away. Inadequate sanitation, bathroom sewage, and household waste are dumped in the same zone where the garbage floats under their house. The same slum area, full of junk and very inadequate infrastructure facilities for this area, made his move to make changes for the fishing village [1].

Therefore, the application of green architecture is expected to represent the entire process of creating public spaces by the sea because we can optimize interactions in one place by using natural and human resources. Thus, all activities in the area can be mutually beneficial and make humans in the room comfortable with environmental feasibility, which is then realized through science (architecture). The coastal area of the sea is a source of life for the fishing village community. It is also a social responsibility to the surrounding community

for the need to improve their standard of living. It is hoped that this design can create good conditions in the area according to its function [2].

Although it is open to residents with higher education, kampung is the only sort of organization that can accommodate portions of the Indonesian population with the lowest economic and educational levels [3]. Indonesian villages are not just rural farming communities. There are various types of villages than agricultural ones. In Raharjo (2014), Saparin (1977) describes various kinds of Indonesian communities, one of which is a fishing community [4]. Village patterns vary depending on the village's location and the residents' means of subsistence. Dispersed settlement patterns, concentrated settlement patterns (nuclear), and elongated (linear) settlement patterns are the three different forms of village patterns [5].

Geographically speaking, fishing settlements are those that are in coastal regions that serve as a transition between land and water [6]. A group of people called fishermen depend on marine items for their livelihoods, either by catching or growing them. They typically reside near the coast, in a neighborhood close to where they conduct their business [7]. Fisher Village is a place for fishermen to live their lives, which is a basic need. Usually, the location of fishermen's houses is very close to the main livelihood where they do business, namely rivers or beaches [8]. These activities can be carried out both inside and outside the building. The facilities provided in the area meet the needs of the perpetrators of activities such as housing, recreation, education, health, sports, and social facilities. Users from the region come from several general backgrounds [9].

Green architecture known globally as green architecture, is an architectural style that focuses on architecture that is environmentally friendly and minimizes the consumption of natural resources, energy efficiency, wise and sustainable use of water, and non-polluting and recycled materials. Green architecture is also a development planning approach that aims to minimize damage to nature and the environment where the building stands. In green architecture, various essential terms, such as sustainable development, are developed or what is known as sustainable development. The tour was popularized in 1987 as a development that can meet the needs of today's people without sacrificing natural resources that must be passed on to future generations. This was stated by the Prime Minister of Norway Bruntland [10].

2 Method

In 1994 the U.S. Leadership in Energy and Environmental Design (LEED) standards or The Green Building Council issued a standard [11]. The principles of green architecture include Sustainable development. Efforts are made to reuse existing buildings and preserve the surrounding environment. The availability of land shelters, roof gardens, and tree planting around the building are also recommended. Environmental Preservation is conducted in various ways, including cleaning and recycling used water and installing rainwater collection buildings [12]. In addition, the use and supply of water must sustainably be on the coast. Increasing energy efficiency can be done in various ways, for example, by making a layout with a building orientation that can adapt to changing seasons, especially the sun's position. Renewable building materials, the best material for green architecture is to use recycled materials or renewable materials that require less energy to produce [13]. These building materials are ideally local and are free from harmful chemicals. A suitable property of building materials in green architecture is that they are non-polluting raw materials that can last a long time and be recycled—the quality of the environment and the room. In the room, things are considered that affect how users feel in a room [14].

3 Results and Discussion

Planning for the New Seberang Fisherman's Village in Belawan, Medan is the name of the project. This project is an example of fishing village planning that has the potential to be used as a public space by utilizing the potential of nature, specifically mangrove forests, and community capabilities in the form of positioning educational, recreational, and commercial areas in public spaces that are organized while still providing residential areas for the fishing village community.

3.1 Project Description

The location is adjacent to the Hamparan Perak fishing village, Hamparan Perak District, Deli Serdang Regency, North Sumatra 20374. The area of this location is around 30,600 m². Regarding the selection of the project location, a review was carried out through a literature review and regional structure to ensure that the area selected for planning could be developed, and factual data regarding the location was sought. Then a field survey was carried out to observe the current conditions of the area (physical and non-physical) and continued with the design concept (Figure 1).

Figure 1. Project Location

Source: Google Earth [15].

3.2 Zoning Concept

The basic concept was taken from 3 problems that previously existed in the Sebrang Belawan Fisherman's Village area which were considered the most important, namely waste, poverty, and education. The people of Fisherman's Village are not aware of the importance of a healthy and clean environment, there is a lot of rubbish under their houses. Garbage that is left to pile up will cause a nest of germs and disease. Also, the average income of the residents of Fisherman's Village is still low. Apart from that, there is a lack of awareness among parents and children of the importance of education. From this third problem, there is a solution that can improve people's standard of living, care about the environment, and create an independent village. The previous area had dense and irregular settlements and a low economic background. The new site is designed in such a way as to eliminate slums and create a healthy and supportive environment for survival and to become an independent area. There is no green area, and it is indicated as a slum area. The problems in the previous settlement were divided into several zoning according to the needs at the last site, A=Residential, B=Social, C=Pier, and D=Recreation (Figure 2).

Figure 2. Zoning

There are three types of dwellings with a total of 60 families, and the number can be increased according to the development provisions. (1) Social zones have several buildings as gathering places and activities. (2) Boat parking zone, there are several dock points in the fishing village. The main wharf is for parking large boats, and a pier in each residential area for small boats. (3) Recreational zone, water tourism is available in Kampoeng Nelayan by boat. In addition, you can shop at the floating market from the boat and a food court with a menu of typical fisherman villages.

3.3 Mass Concept

The selection of the mass form is made by taking into account the environment and culture of the fishing village community. The application of stage building is one of the main characteristics of the Malay community. The concept of zone formation also uses a centralized concept with the aim that the community can interact and have a meeting point with one another at the center with various activities [9]. In addition, each area's housing design is inspired by resorts in the Maldives. Using a form of arrangement such as a resort is one of the unique things to attract visitors, considering that this area has functioned as a tourist and residential area (Figure 3).

Figure 3. Landscape

3.4 Accessibility Concept

To reach the site, you can take a boat to cross from Belawan to the site. The route to be traversed is the Belawan Sea. The travel time from across to the site is only about 5 minutes. Entrances function as markers in an area with certain characteristics of that area. The entrance with the words "Welcome to Kampoeng Nelayan Baru" indicates that visitors have arrived at the entrance to Kampoeng Nelayan Baru. This landmark is located on the site after visitors enter through the pier. Then, on the opposite side of the parallel entrance, there is also a gate as a marker for the exit from Kampoeng Nelayan (Figure 4).

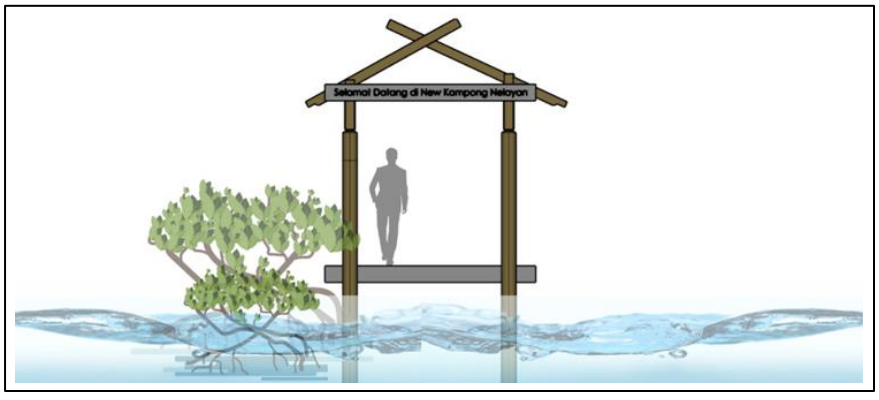

Figure 4. Entrance Details

3.5 Interior Architecture Concept

The proportion of space is adjusted according to the existing space standards. Average users and visitors are more adults. In addition, space also follows existing needs. The colors in this area are natural colors commonly known as earth tones. However, for naming the area/entrance, use the color "strong", which is yellow, as a marker for the area (Figure 5).

Figure 5. 3D Information Center

The shape of the space is designed to simply meet the needs of the user. The area formed is made as optimal as possible so that activities are carried out comfortably. The material used is wood, which wood itself has heat-absorbing properties, suitable for coastal areas. The selection of this material is also based on the concept of green architecture by looking at the material's benefits. Lighting can be obtained from natural lighting and artificial lighting. Natural lighting is obtained by optimizing openings and ventilation. Meanwhile, artificial lighting is obtained from the PLN network and distributed to each building. The ventilation system in the building uses a natural approach, with good openings and ventilation.

3.6 Regional Macro and Micro Concepts

The design of this area includes macro and micro divisions. It is divided into several zones according to regional needs on a macro basis. The zone is divided into four regions: 45% residential zone, 20% social zone, 5% boat stop zone, and 30% water recreation zone. Responding to various problems, such as the amount of waste, poverty, education, and others, is manifested in a macro concept that becomes an alternative design. Within the macro concept, there are micro concepts which include the souvenir market, Floating market, School, Residential area, Main pier, Entrance, Courtyard, Information center, Village office, Community hall, Mosque, and Foodcourt.

3.7 Facilities

The information center is a must-have place in this area which aims to make it easier for visitors to find information for traveling in Kampoeng Nelayan. Apart from that, visitors who want to spend the night at Kampoeng Nelayan are required to report and take care of administration at the information center before being directed to accommodation. The design of the information center only has two closed sides, this is to make it easier for visitors/users to access the intended space (Figure 6). The village office functions to take care of village administrative interests and as the place of duty for the village head, village secretary, and head of affairs. Apart from that, the village office has the function of storing files which requires sufficient space to archive data. In this area, the village office is in the central area so that the road to the village office is easy to reach. The building design of the village office is very simple with wooden materials (Figure 7).

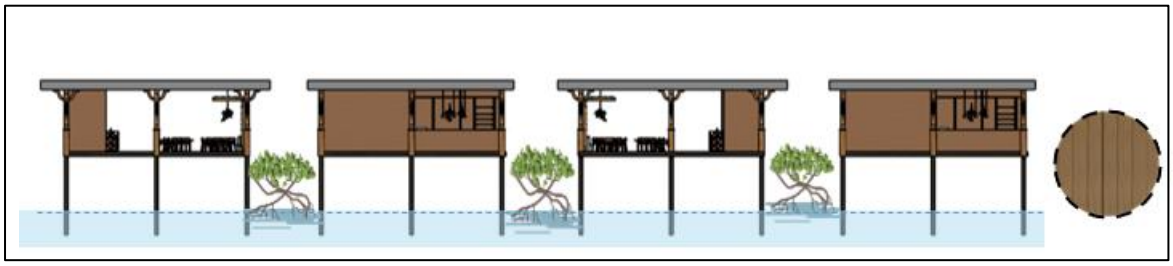

Figure 6. 3D Information Center

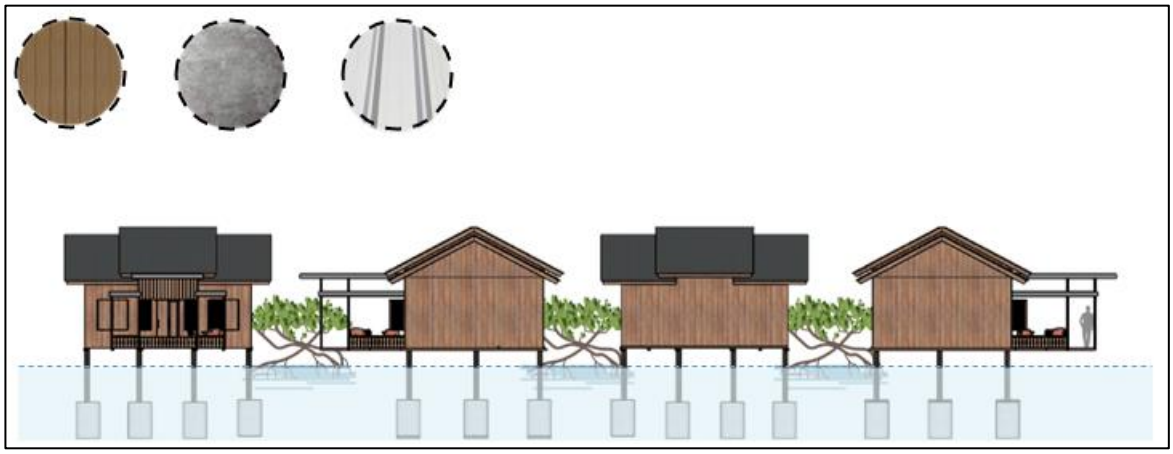

Figure 7. 3D Village Office

The community hall is a supporting building that functions as a gathering place and shelter which is placed in the central area. The design of the community hall is open without walls so you can enjoy the surrounding environment. The materials for this community hall use wood and the roof uses shingle material. The building design and materials are made in harmony with the concept of the green architecture theme so that users feel close to nature (Figure 8). A prayer room is provided as a place of worship and also as a facility to support user activities. The mosque's design is white which symbolizes purity, purity and cleanliness. The prayer room is located in the central area right next to the community hall. This 2-story mosque measures 20 meters x 20 meters and can accommodate around 80 people (Figure 9).

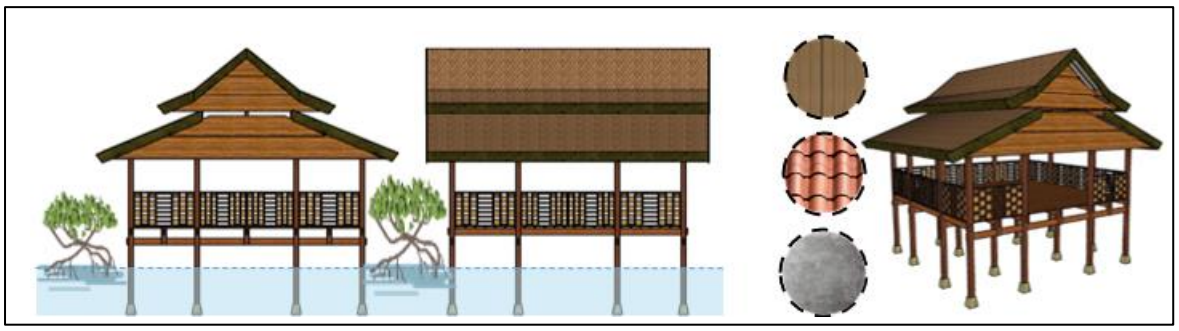

Figure 8. 3D Community Hall

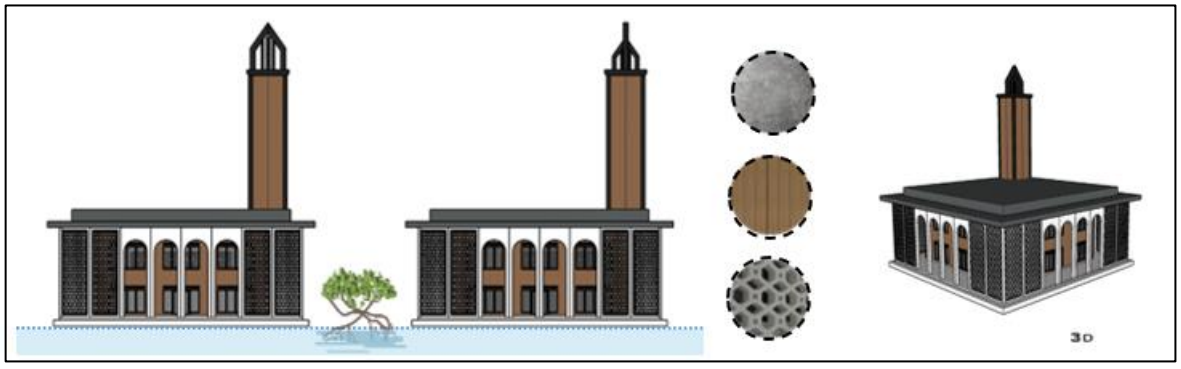

Figure 9. 3D Mosque

The food court aims to add variety to tourism as well as open up a new source of livelihood for the fishing village community. Food courts are one of the main destinations for visitors and have a strong attraction. The food court provides several blocks for rent to local people who want to sell food. The food offered is generally seafood or seafood typical of this area. The food court is located in the central area right next to the main pier. Placing a food court at the front will be an attraction for people crossing and can spoil the eyes because it leads directly to the sea/estuary (Figure 10).

Figure 10. 3D Design Foodcourt

The souvenir market is presented as a support for the economic activities of the local population. With the souvenir market, visitors can buy souvenirs from Kampoeng fishermen. At the souvenir market, residents can sell crafts made from used rubbish, which can reduce the presence of rubbish. The souvenir market is located not far from the food court. Visitors who want to eat at the food court must pass through the souvenir market to enliven the market and visitors can stop at the souvenir market to shop (Figure 11). The floating market is an interesting attraction for visitors who want to shop on a boat. This creates a new experience for tourists. The concept of this floating market is that the market is provided with a flat area measuring 15x32 meters. The marketplace is at the same height as the boat (located below and floating to facilitate shopping activities on the boat. Visitors can also go down to shop in the area without a boat (Figure 12).

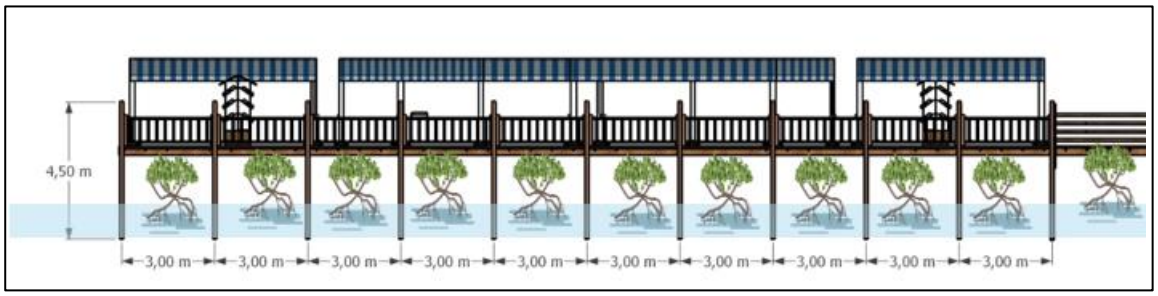

Figure 11. Souvenir Market Design

Figure 12. Floating Market Atmosphere

Schools play an important role because they are a place to learn and gain knowledge. This school provides elementary, middle, and high school. In previous fishing villages, there were no middle and high schools or other supporting facilities available. Children who want to go to school have to cross the estuary which

increases transportation costs. The 2-story school design uses wooden materials, and optimal openings are provided so that lighting and ventilation enter the room properly (Figure 13).

Figure 13. School Design

3.8 Application of Green Architecture

Utilization of energy from natural resources, utilizing energy from natural resources such as collecting rainwater will be useful to support daily needs such as washing, bathing, watering plants, and so on. Each housing unit is provided with a plank and a storage tank for rainwater. The building is designed taking into account the climate in the area and user comfort factors. To respond to the climate in hot areas, wood materials are used because the basic properties of wood do not absorb excess heat. Apart from that, openings/ventilations are provided to ensure that wind can enter the building (Figure 14).

Then, the building must also pay attention to the place and surrounding conditions. Between buildings and land, there must be interrelated interactions. Buildings must be designed and built according to the potential of the land where the building will be built. In this case, in the coastal area, there are mangrove plants. However, the previous area had not optimized the function of mangrove plants. By utilizing mangrove forests, marine biota can emerge and become a livelihood for fishermen and also function as a barrier to sea waves. By applying this principle, society is expected to be able to improve economic welfare. This principle is supported by the existence of facilities designed by the activities, social system, and economic needs in New Kampoeng Nelayan. The New Kampoeng Fishermen community participates by working as tour guides directing visitors, selling at the available markets, renting boats to visitors to get around, and opening businesses at home.

Figure 14. Application of Building Concepts

4 Conclusion

Every region faces a different set of everyday issues. Every live person has the right to a decent existence. However, there are quite a few regions with a low level of living, such as unclean environments that spread disease, poor economic conditions, and a lack of knowledge of education. This occurred in the Sebrang fishing village hamlet in Belawan Medan, one of the villages in the city. In Fisherman's Village, the population density is rising yearly. Because of their haphazard housing construction and poor organization, their neighborhood

turned into a slum. By creating mangrove forests and marketing the location as a tourist destination in the city of Medan, the planning of the New Fisherman's Village Sebrang Belawan, Medan offers an alternative to addressing the issues that existed in the previous Fisherman's Village. It is believed that the components of green architecture will be able to improve the settlement of Fisherman's Village. This idea aims to preserve the continuity of nature, and it does this by employing energy derived from renewable natural resources, adjusting to the local climate, caring for the land, and empowering the local community. The project's goal is to transform the coastal area, which was formerly home to slums, into an integrated area and, at the same time, a popular tourist destination for residents of Medan City. This neighborhood makes use of nearby amenities, and its residents work to make improvements in the hope that eventually it will cease to be a slum. In essence, nature constantly gives humans what they need, depending on how human attitudes and actions may give nature what it needs.

5 Acknowledgment

This project is a study of the design of The New Fisher Village in Belawan, Medan with Green Architecture Methods. This initiative aims to transform the once-slum coastal area into an integrated area that doubles as a tourism destination. The Department of Architecture, Faculty of Engineering, Universitas Sumatera Utara, and all those who helped with the study and design are acknowledged by the author.

6 Conflict of Interest

The authors whose names are listed below certify that the manuscript does not have a conflict of interest.

Sofia Idris

This statement is signed by all the authors to indicate agreement that the above information is true and correct (a photocopy of this form may be used if there are more than 10 authors):

Author's name (typed)	Author's signature
Sofia Idris	

References

[1] S. Dimitra, “Potensi Kampung Nelayan sebagai Modal Permukiman Berkelanjutan di Tambaklorok, Kelurahan Tanjung Mas,” *Jurnal Teknik PWK*, vol. 1, no. 1, 2012.

[2] D. P. Duerk, Architectural programming: Information management for design, Van Nostrand Reinhold: Francis, 1993.

[3] D. Khudori, Menuju Kampung Pemerdekaan, Jogjakarta: YayasanPondok Rakyat, 2002.

[4] R. Adisasmita, Pengelolaan Pendapatan dan Anggaran Daerah, Yogyakarta: Graha Ilmu, 2014.

[5] N. Daldjoeni, Geografi Kota dan Desa, Bandung: P.T. Alumni, 2003.

[6] Kusnadi, Keberdayaan Nelayan Dalam Dinamika Ekonomi Pesisir, Yogyakarta : Ar-Ruzz, 2009.

[7] Imron, Pemberdayaan Masyarakat Nelayan, Yogyakarta: Media Pressindo, 2003.

[8] A. M, Pluralisme Agama dan Kerukunan dalam Keragaman, Jakarta: Penerbit Buku Kompas, 2001.

[9] H. T. Fachrudin dan F. Rahmadani, “Penataan Kampung Nelayan dengan pendekatan Arsitektur Ekologi di Kelurahan Bagan Deli Kota Medan,” vol. 3, no. 2, 2019.

[10] H. Frick, Dasar-Dasar Eko-Arsitektur, Yogyakarta: 1999, Yayasan Kanisius.

[11] LEED, “Benefits of LEED,” Washington DC.

[12] W. James, Green Architecture, Philip Jodidio, 2008.

[13] A. Chel dan G. Kaushik, "Renewable Energy Technologies for Sustainable Development of Energy Efficient Building," *Alexandria Engineering Journal 57(2),* 2017.

[14] E. M. Mohamed, "Use Energy Efficiency, Eco-Design, and Eco-Friendly Materials to Support Eco-Tourism," *Researchgate,* pp. 15-41, 2019.

[15] "Google Earth," [Online]. Available: https://earth.google.com/web/search/https://www.google.com/search?q=Kecamatan+Hamparan+Perak+Kabupaten+Deli+Serdang+Sumatera+Utara+20374&oq=Kecamatan+Hamparan+Perak+Kabupaten+Deli+Serdang+Sumatera+Utara. [Diakses 23 May 2023].