Ecotourism to improve the quality of Deli riverscape, Medan City, North Sumatra, Indonesia

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Abstract. The research objective was to propose the Deli riverscape concept through ecotourism. The data were collected by doing depth-interview and participant observation. The anthropology of landscape approach was implied in this study to analyze the spatial concept in Deli riverscape toward building ecotourism. The planning stages were survey, data inventory, data analysis, synthesis, and riverscape concept. The result of this study was the basic concepts of ecotourism development, which were realized in the form of the Deli riverscape. The riverscape concept consists of spatial planning, green planning, circulation, facilities and utilities, and activity. It indicated the need for local community participation in ecotourism through environmental management activities in waste processing. In addition, there is a need for tree planting, which is a social activity in presenting spaces for ecotourism. There is a straight line between Deli riverscape formed and improvement riverscape quality for ecotourism development. It can be concluded that there are four infrastructure developments, namely the main tourist space, supporting space, primary circulation path, and secondary circulation zone.

Keywords: anthropology of landscape, deli riverscape, ecotourism

1. Introduction
Slum is a problem in the Deli riverscape, Medan. This condition affects the reduced life quality of the Deli riverscape. The land use with a high-density level of more than 126 units/hectares is an uninhabitable settlement. Several problems arose, such as not having regular buildings, poor environmental road conditions, lack of water and waste management. These problems should be priorities in regional and city planning because there is a need for research on improving the life quality of the Deli riverscape. The population density of an area, the ownership of land and buildings, and the quality of existing facilities and infrastructure all contribute to determining whether or not an area is classified as a slum. Residents in diverse slum regions dwell in close quarters, making it difficult for emergency vehicles such as ambulances and fire engines to pass.

The term slum area occurs in the context of housing and residential regions with a lack of sanitation and air pollution caused by garbage or waste. Slums and slum houses are two different things. Slums are settlements that are inappropriate for human occupancy due to building irregularities, high building density, and poor quality structures, utilities, and infrastructure. Slum housing, on the other hand, is housing that has a low quality of function as a place to live. Rubbish accumulates due to a shortage of garbage collection services. Deli riverscape in Medan deals with a lot of history and local knowledge.
The mapping of cultural, historical, social, economic, and ecological values was a focus of local knowledge [1]. One of the places that played a part in the history of the economy during the Deli Sultanate is the Deli riverscape, which divides the city of Medan. It is located in Aur village, Medan Baru district, Medan city, on the western side of Maimun palace [2].

Given the river's historical significance and current ecological health, it is vital and urgent that the river be maintained in tandem with Medan's rise as the capital of Indonesia's third-largest province [3]. Wampu-Besitang, Belawan-Snake-Padang, Bahbolon, Toba-Asahan, Nias, Sibundong-Batangtoru, Barumun-Kualuh, Trunk Angkola-Batang Gadis, and Deli are the nine river areas in North Sumatra. The Deli riverscape is a section of the Belawan-Ular-Padang river system. The Deli riverscape is also a key drainage network to reduce waterlogging in towns' residential and commercial zones.

Along the Deli riverscape, there are many resident activities such as settlements, schools, offices, and industry. The river water is cloudy in color and along with the river and river bodies, piles of garbage are found. The cause of this is culture and the lack of good management by the community around the river. The water pollution in the Deli riverscape is caused by a lot of garbage is thrown into the river, such as used tires, plastic waste, junk, and even building debris which will have an impact on disturbing the balance of the environment. This causes all types to be disposed of in rivers. Apart from damaging the quality of water bodies, they will also damage the aesthetics of the environment. This illustrates the lack of human care for the aesthetic value of the environment and natural ecosystems.

One of the causes of the flood in the city of Medan due to the overflow of the Babura river, where this river meets the Deli river in the center of Medan city [4]. Deli riverscape is one of the largest rivers that cross the city of Medan, so the level of vulnerability to flooding in urban areas is also high. The Deli riverscape's water debit continues to increase when the intensity of heavy rains causes the Deli riverscape to overflow. Deli riverscape frequently floods, both as a result of a capacity that is less than the existing discharge, a lack of maintenance and drainage, and a disposal system that does not adapt to the environment, resulting in the rainy season [5].

This study is concerned with proposing the concept of riverscape on the Deli riverscape toward ecotourism. The riverscape is considered the landscape area and residents who live surrounding it. The significance of the study was to create an atmosphere of living harmony between humans and the environment. In addition, ecotourism will be able to increase the income of the residents [6]. The biggest benefit of these rivers is as a rainwater drainage channel and wastewater it has the potential to be used as a river tourist attraction. The message to be delivered to this area is a harmonization of the life of the riverside community in an ecological city. This is disclosed to improve the quality semi-natural urban river environment and maintain its sustainability.

2. Method
This was a qualitative study. The anthropology of landscape approach was implied in this study to analyze the spatial concept in Deli riverscape toward building ecotourism. Data collection includes biophysical data regarding site conditions, social, economic, cultural aspects, and other supporting data that affect the Deli riverscape planning process. Analysis and synthesis of the data obtained were analyzed descriptively quantitatively and in spatial form.

The analysis is carried out by segment, which begins with the preparation of the basic concept of Deli riverscape planning which is then developed in the form of spatial plans, circulation, green planning, activities, and facilities arrangement which is outlined in the form of written and spatial Deli riverscape concepts. The location of the study was in several sites in the Deli riverscape namely Kecamatan Medan Kota. The location can be seen in Figure 1.
The time of the study was three months. It started from August to October 2021. The data were collected through documentation, interview, and participant observation. The stages of the study are shown in Figure 2.

To achieve the objectives of the study, two combined methods were used, namely the ethnography method and design. The ethnographic method by conducting participant observation and in-depth interviews to explore the meaning, function, value, norm, and local wisdom with a landscape anthropological approach [7] [8]. From the data obtained in the field, the next stage uses the method of planning and designing a landscape [9]. The output of the study is the riverscape concept in the form of a master plan containing descriptions of social engineering. This social engineering is to explain the stages of management and the development process that will be used for the development of the Deli riverscape.
3. Result and discussion

3.1. Survey
In this stage, the researchers determine the location near the resident's house. It was taken to simplify the data and able to find the pattern of the resident's interaction with the riverscape, such as using the area to plant yam and corn, fishing, and throwing garbage. The amount of houses calculated from the exact riverscape, starting from point 0 on the riverscape, is 15 housing units and the total amount of houses in the settlement is 150 housing units with a watershed radius varying from point 0 on the riverscape to 30 meters from point 0 on the edge river. With an elongated settlement pattern along the riverscape. But the form of settlement is uneven. The population of the Deli riverscape is 290 people with 220 families living in 150 houses. From the number of households, we took a sample of 22%.

3.2. Data inventory
Data inventory was collected in the form of photos, interview sheets, and observation sheets. Deli riverscape is one of eight rivers in Medan City. Initially, during the Deli kingdom, the river was the lifeblood of trade to other areas. Currently, the forest area upstream of the Deli River is only 3,655 hectares or 7.59 percent of the 48,162 hectares of the Deli watershed area. In fact, with an area of 48,162 hectares, a length of 71.91 kilometers, and a width of 5.58 km, the Deli watershed should have a natural forest for water catchment areas of at least 140 hectares, or 30 percent of the watershed area. In addition, the waste is now polluting the river. As Deli riverscape pollution, 70 percent of which is caused by solid and liquid waste. Solid domestic waste or waste generated in Medan City is 1,235 tons a day.

3.3. Data analysis
Dense slum settlements on the banks of the Deli riverscape are caused by the large number of people who want to have housing in cities that are not matched by high purchasing power. The average resident's house is made of wood, and some use brick walls. The size of each house is too narrow for the family living in it. There are no spaces between the houses. They are classified as low-income individuals from a social and economic standpoint. The majority of residents in the surrounding communities have permanent jobs, and some residents work odd jobs in order to take advantage of existing opportunities, such as the small stalls that have sprouted up in this area as part of the community's economic activities [10]. For drainage channels by dumping it into the river through small ditches that go directly to the river. Likewise, for the treatment of dirty water in slum settlements because of its location on the banks of the river, residents use the river for needs such as bathing, washing, and defecating. For this reason, sewerage is not available because residents directly use the river for some needs.

3.4. Synthesis
In developing an area into ecotourism, a concept is needed as a basis for planning. The aim is to preserve nature and culture and improve the welfare of the local community [11]. The planning concept developed in the Deli riverscape is ecotourism in sustainable urban areas (sustainable urban ecotourism). This concept is a regional development plan concept that accommodates the sustainability and quality of the river's natural environment, participation, and economic opportunities of the local community. The application of the concept to the landscape is in the form of a development plan model that is adapted to the character of the landscape and tourism potential in the area.

From the results of the potential assessment, it is known that there are two locations as centers of ecotourism development, with three models of development plans. This development plan model is translated into three landscape units, as follows:
- The natural ecotourism development zone is an ecotourism area with dominant endemic vegetation. The ecological message is highly emphasized to maintain, improve, and sustain the quality of the natural urban river environment.
• The semi-natural ecotourism development zone is an ecotourism area that combines natural and man-made structures. The message that will be conveyed in this area is the harmonization of the life of riverside communities in ecological cities. This is expressed to improve the quality of the semi-natural urban river environment and maintain its sustainability.

• Ecotourism development support zone, which is an area of the dominance of man-made structures. Quality improvement is described by physical improvements on river banks for the sustainability of the river environment.

3.5. Riverscape concept

The riverscape concept consists of spatial planning, green planning, circulation, facilities and utilities, and activity. The concept of circulation in ecotourism is in the form of a circulation net that is adapted to the concept of a landscape development plan and tourism potential which is a local element of the development center area. The corridor that connects the center of the area with groups of attractions is an important element that can increase the potential of the area. Ecotourism can be visited through two entrances located at the location of the development center [12]. The selection of the entrance to ecotourism is based on the potential of the area as an area that is supported by the many objects and potential tourist attractions found in this location. Therefore, it is hoped that this location can be an illustration or storefront of ecotourism are shown in Table 1.

| Table 1. Ecotourism area infrastructure development plan in Deli riverscape. |
|---------------------------------------------------------------|
| Circulation spaces and paths | Infrastructure |
| Main tourist area | a. Interpretation board |
| | b. A place to rest and gather |
| | c. Outdoor classroom |
| | d. Shelter |
| | e. Stall |
| Support area | a. Information center |
| | b. Restaurant |
| | c. Souvenir shop |
| | d. Parking lot |
| | e. Toilet |
| | f. Mosque |
| Primary circulation pathway | a. Road width 3-5 meters |
| | b. Pedestrian |
| Secondary circulation pathway | a. The trail |
| | b. Bicycle |

The concept of space and circulation in ecotourism in the Deli riverscape divides the ecotourism development zone into two, namely, the ecotourism development center space and the supporting space for the ecotourism development center (space outside the development center which is still in one zone). Spaces at the center of ecotourism development, where there are main rooms and supporting spaces connected to circulation paths. The main room is a space that accommodates all tourist activities. To enter the thus room, the visitors must go through a supporting room. The supporting room serves not only as a receiving room but also as a transition room. This space connects the outer space of the development area with the main tourist space, as well as a liaison between the river area which is the primary tourist route, and the main tourist space on the mainland (riverbanks). The Deli riverscape concept can be seen in Figure 3.
Medan city is also a river route. There are at least seven rivers that through it, namely: Belawan Sungai, Badra Sungai, Sikambing Sungai, Putih Sungai, Babura Sungai, Deli Sungai, and Sulang-Saling Sei Kera Sungai. Medan city, located downstream of the Deli watershed, is a flood-prone area due to its flat and lowland terrain, with elevations ranging from 2.5 to 40 meters above sea level and a slope of 0-4 percent. Additionally, in Medan, besides the Deli riverscape, there are also other rivers, namely Babura, Belawan, and Percut river [13].

4. Conclusion
The concept of Deli riverscape covered both physical and social aspects. It is obvious to deliberate the residents who lived around the riverscape to contribute in terms of the social actor to meet the riverscape for ecotourism. The stages of concept for Deli riverscape toward ecotourism were built as follows:

- The basic concept of Deli riverscape is based on the values of local wisdom in its development.
- The development concept consists of a spatial plan, a circulation plan, and a green layout plan.
- The special characteristics of the Deli riverscape that are raised are cultural values and spatial division based on planned activities, circulation patterns of shade trees and some production vegetation, providing alternatives for bicycle users, paying attention to user safety, and supporting propriety that characterizes the Deli riverscape.
- The concept of Deli riverscape toward ecotourism was built based on infrastructure developments. It is obvious that the existence of a riverscape area is able to create the main tourist space, supporting space, primary circulation path, and secondary circulation zone.
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