The typology of settlement in the Deli River side Medan Labuhan Subdistrict

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Abstract. In the city of Medan, population growth is increasing. That affects the Location of settlements in the city. Riverside settlements are a way to divert townspeople to outskirt. It has many problems, caused by natural population growth and migrants (urbanization). Increasing population growth makes settlements a poor quality neighborhood. Without good planning, the settlements become spontaneous settlements and irregular. Medan Labuhan district is a district that has settlements on the river side of Deli. Medan Labuhan Subdistrict has a total of 6 urban villages. This study aims to find the typology of residential areas in Deli riverside, Medan Labuhan district and to make the context of settlement concepts in Deli riverside, Medan Labuhan district. The research method used by the qualitative method. They are observation and interviews. Observations were made by observing the topology of residential areas from spontaneous settlements in Medan Labuhan. It will also be made to compare with government policies. This research contributes to knowledge about riverside settlement typology in Medan Labuhan district. This research is also useful for the Medan City Government to be able to make a clearer policy related to the rules of development in the Deli riverside area.

1. Introduction
Medan City is a metropolitan city that has many settlements in diverse geographical regions. Definition of settlements in geography is as natural (natural) and fiscal (artificial) with all the equipment that used by humans, both individually and in groups to live, both temporarily and permanently to carry out their lives. Settlements on the banks of the Deli river are one of the settlements in the city of Medan. It means river is the geographic which forms the settlements. Settlement areas in the city of Medan are in 17 subdistricts with an area of 628.60 ha slum or 2.37% from outside the city of Medan.

In this study, the settlements that will be discussed are settlements on the riverside of Medan Labuhan Subdistrict. The settlement in one of the Medan Labuhan villages has a flood issue that is still unresolved due to high rainfall. The relationship between society and nature which is not good causes flooding. [2] Even though, settlements are formed from five basic elements namely; nature (nature), man (humans), society (society), shells (houses), and networks (networks or infrastructure). The linkage of the elements settlement result the settlement forms with a different typology of residential areas on the Medan Labuhan Deli riverside.

This discussion is important to be studied for finding the factors that influence the growth and shape of settlements on the Medan Labuhan Deli Riverside. These factor are examined based on developments that occurred in the Medan Labuhan Riverside. Contest concepts need to be analyzed to produce
settlements that are free from flooding and use the river well. So, this research can provide benefits to science, government, and further research. The main benefit of this research is for the government to be able to make the clearer policies related to the rules of development in the Deli riverside area.

2. Literature Review

A settlement is formed from aspects that affect everyday life. Lifestyle is the main variable in forming a city organization that is specified in the region, space, time, has the purpose and communication of a homogeneous group that has racial characteristics, ethnic origin, religion, class, income [12]. Settlements that are part of the city can be said to originate from a group of people who have the same lifestyle and have the same characteristics. These community groups grow into settlements. The influence of different lifestyles makes grouping settlements based on aspects of life. These aspects are social conditions, economic activities, transportation systems, communication media, political systems, administrative systems, culture, and entertainment [14]. The social aspects and economic level of the community in a settlement will affect the shape and position of the residence [3]. It can be said; settlements are formed by aspects of life consisting of physical and non-physical aspects. Physical aspects consist of settlement forms and nonphysical aspects related to life. Non-physical aspects are a major part in influencing the form of a settlement.

A settlement is formed from five basic elements, namely: nature (nature) which can be used to build houses and function as much as possible, man (human) which is both personal and group, society (society) not only personal life that exists but also social relations, shells (houses) or buildings where humans live with their respective functions, as well as networks (networks or facilities), namely networks that support the function of settlements both natural and man-made such as environmental roads, provision of clean water, electricity, drainage, etc. [2]. Based on these basic elements, developing settlements are influenced by several factors. The development of settlements (development of human settlement) is influenced by several factors, namely: the growth of density (urban population) and urbanization (urbanization) [2]. Thus the increasing number of occupancy in the settlement area has led to the growth of residential housing. The growth of spontaneous settlements and slums is an integral part of the process of urbanization.

2.1 Growth of Unplanned Settlements

Unplanned settlements arise with the need for housing. Moreover, most of the unplanned settlements are residential spaces which is built in areas that are not officially planned as residential spaces. The construction of informal settlements continues to grow due to the social aspects of the residents. These aspects are carried out from the place of origin where the residents live. The financial influence of this process and the high value of the formal real estate market is one of the factors that influence the growth of unplanned settlements [3]. Physical development of informal settlements are form of patterns, circulation, and locations established primarily in the social dimension. On the other hand, the analysis of physical forms such as roads, plots, and building patterns can predict the direct impact on social relations.

The morphology of the informal area is based on three phases: Settlement, Proliferation, and Socialization [3]. 'Settlement' is the first phase that has occurred in the 60s, namely young people who emigrated from Upper Egypt. In this phase, the physical form of settlements is still formless; it still consists of single contributor houses. Then after increasing their socio-economic life, they began to adopt their families and invited relatives to join them in new locations. Moreover they helped their relatives in finding work and creating new informal locations. Here begins the 'Proliferation' phase.

In unplanned settlements, the social conditions of residents are very influential in forming settlements. The most prominent characteristic of unplanned settlements is seen in the low quality of residential houses that do not have adequate infrastructure and social facilities [1]. Every residential activity requires certain spaces to interact with. Residents can also connect the space needed according to their needs and to support their daily activities.
The growing population is generally supported by social conditions and economic background [6]. Although, each unplanned settlement has different characteristics compared to other regions, these general characteristics are the main factor in assessing whether or not settlements are planned or not. Spatial relationships also form spaces that can be used by residents to interact or as residential areas. Unplanned settlement growth will also increase if there is social equality in its inhabitants.

Economic aspects are one of the factors that influence the development of unplanned settlements. In fulfilling economic aspects, there is an increase migration to urban areas. Migration is generally carried out to improve economic conditions that can be obtained in big cities. Immigrants who expect a better life will do migration. They need space for their homes. Meeting the needs of a place to live will be manifested by finding housing areas that are by their economic capacity. Movement among residents also allows for the creation of a space for economic interaction in the region [10]. Interactions between residents often create a need for mutual benefit; thus, this space of interaction supports the economic activities of the population in the region.

2.2 Typology of Riverfront Unplanned Settlements

Informal settlements form the same pattern and pay close attention to public services, jobs and homes. They are usually located in locations according to aspects such as considering penetration into narrower residential streets, which consequently remains protected from foreigners. The distance between the three elements: work, public service and home are achievable on foot. The pattern formed, namely by the presence of pedestrian roads from commercial areas to residential roads without interruption by extensive vehicle traffic routes, is a major factor [15].

Previous studies on housing preferences related to the water environment found five important physical forms used in residential areas [7]. Five physical forms that can be separated into two main components, the first component is the building component of "housing type" and the second component is the environmental component which includes "the width of the river bank open space", "riverbank construction", "open space" and "access Riverside". [5]

Type of residential area on the river bank has a level of floating houses, row houses, apartments. The width of the riverbank open space consists of less than 10 meters, 10 meters to 20 meters, 21 meters to 30 meters, and greater than 30 meters. Riverbank construction has levels starting without construction, polders or dikes, and riverbank platforms. Types of riverfront open spaces have levels of green open space, wetland parks and playgrounds. Levels on riverbank access consist of river routes and promenades.

At present, the existence of floating houses (lanting), Jukung (boats), pedestrian paths and road cracking have increasingly disappeared due to the layout of the river and its settlements. Because settlements no longer regard the river as an orientation due to the development of cities towards the land area and in the end the river is used as a rear area. [11]

The river is not the only reference to the orientation of waterfront residential houses. The development of a large city houses facing the main road. In the direction of the house towards the river there are three directions, namely the residential area facing the river, back to the river and facing two directions.

Based on the direction of occupancy, the location of houses in settlements also consists of 5 types, namely houses in the middle of the waters, jutting towards the waters, located in the waters, between the waters and land and also houses located on the edge of the water.

The location of houses in residential areas affects the form of residential houses. The shape of the house is divided into 3, namely the stage house, raft house, boat house. Variations from one region to another are not reflected in differences in topography, climate, environment and economy but also the extent to which regional pioneers adopt a form of local housing. Variations in the shape of residential areas on the banks of the river have been adopted based on the initial growth of settlements in the area.

2.3 Social Influence in Establishing Riverfront Settlements
Humans are social beings and cannot live without one another. In residential areas, space between a house and another house forms a social space. The socio-cultural aspect is more dominant in influencing the shape of the building compared to physical aspects, such as material, technology, and site conditions. Socio-cultural attitudes and other factors that define social grouping are translated into spatial patterns by changing the position of kitchens, definitions of public and private spaces, use of pages, open to building relationships [13]. This home page is used very effectively for various purposes such as defining privacy, for lighting buildings, for connecting various public and private zones at home.

Open spaces for socializing relate to roads that contact one area with another. The road becomes important as a socializing link because the adjacent houses make a very close kinship relationship. Exchanging stories is one culture that is very much lived in the residential area. The function of the road in socializing in addition to being a liaison can also be as a socializing space. The spaces on the road that are used as a place to socialize are the main roads and at the intersections that are formed.

The road to unplanned settlements takes many dimensions rather than just connecting two spaces. They work as social centers. Residential orders appear as mentioned above due to the social needs of residents who add value to the efficiency of road functions and provide support to be at the core of activities in the district. The width of the road is made according to the relationships of the occupants and how many residents want to interact and what kind of activities they want to propose on the road. As a result, the streets are created efficiently to meet social and economic aspects. By tracing the roads it is clear that most residential roads have narrow widths that limit access of foreigners in the area and control the penetration of traffic. In addition, they allow several activities, namely the street as a house, the streets as an expanded work space, the streets as an expanded café, the streets as an expanded place of celebration and a road as a playground [3].

Roads as expanded houses became roads in informal settlements which played the role of extension of houses. It plays the role of a protected private place, where children can play and women can sit in the afternoon and exchange news and knowledge. The use of this 'near-home environment' functions simultaneously. This compensates for the limited personal space inside the house. The road helps build community bonds. When neighbors get to know each other, social solidarity increases, collective initiatives are easier to realize, and natural supervision and self-policing occur [15]. So that social influence makes the road an expanded work space, the road as an expanded café, the road as a place of celebration and a road as a playground [3].

For residents in settlements, open space means a social and physical environment, where they socialize with family, neighbors, and close friends. In the sense that they expand the shape of the house [9]. The shape of the house was expanded implicitly meant that socializing space was part of the house itself. In determining the boundaries of space, women play an important role. Women can directly adjust to the home environment freely even though they are still under other women's social controls [4]. The expression of "Women 's Place is at home" changed to "Women' s place is both at home in the neighborhood", because there are informal relationships with them so they share shared space for different social activities [8]. Common spaces between houses belong to them as a place where they gather informally, share local news or problems and tasks of daily life [4].

2.4 Government Regulations related to Riverbank Development in Medan City and Indonesia

In article 4 Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat Republik Indonesia Nomor 28 / PRT / M / 2015 concerning Determination of River Line and Lake Lines in the criteria for demarcation line stating that the river border includes the space left and right of the riverbed between the border line and the outer edge of the embankment for the embankment. The demarcation lines are in the form of undisturbed rivers in urban areas, undulating rivers outside urban areas, embankment rivers in urban areas, undulating rivers outside urban areas, rivers affected by tides and springs. Meanwhile, the embankment in question is a flood retardant building made of landfill.

Article 7 stipulates that the boundary lines in undulated rivers within urban areas are determined to be at least 3 meters from the edge of the embankment along the river channel. Whereas in article 8 the
boundary lines of the embankment outside the urban area are determined to be at least 5 meters from the outer edge of the embankment along the river channel. In article 9 it is also explained that in the river boundary there is a dike to control flooding, the space between the edge of the riverbed and the edge of the embankment is a riverbank that functions as a flood channeling space.

In the case of the results of the above review, in article 15 states that the building is in a river border, the building is declared in the status quo and must be gradually regulated to restore the river border function. However, this provision does not apply to buildings for public interest facilities which include building water resources infrastructure, bridge and dock facilities, gas and drinking water pipelines, a range of telecommunications power lines, and electricity buildings.

In the use of border areas in article 22, the protection of embankment bodies as flood control is carried out by prohibiting the planting of plants other than grass, building buildings, and reducing the dimensions of dikes. With the enactment of this Ministerial Regulation, buildings that are located in river boundaries and lake borders that are established based on permits obtained based on correct procedures are declared as status quo and are gradually regulated to restore river border functions and lake borders.

Republic of Indonesia Presidential Regulation Number 62 Year 2011 concerning Spatial Planning for Medan Urban Area, Binjai, Deli Serdang, and Karo, in Article 99 it is explained that permitted activities include the use of river border for RTH, installation of stretches of electric power transmission networks, telephone cables, pipes drinking water, construction of water traffic infrastructure, buildings for taking and disposing of water, supporting buildings for city infrastructure systems, activities for providing locations and disaster evacuation routes, and establishing buildings for the purpose of monitoring disaster threats; activities that are permitted by conditions include activities of agricultural cultivation with plant species that do not reduce the strength of soil structures and activities other than those that do not interfere with the function of river boundaries as local protection areas, including activities for billboards and bulletin boards, construction of buildings which are limited to supporting activities river transportation, water recreation activities, and inspection roads and river water level supervisor buildings;

Activities that are not allowed to be carried out on river border lines include activities that change the landscape, activities that interfere with soil fertility and durability, hydrological and hydraulic functions, flora and fauna conservation, preservation of environmental functions, stand utilization activities, activities that hinder and / or closing disaster evacuation spaces and paths, garbage disposal activities, and other activities that interfere with the river border function as a local protected area; and the provision of minimum infrastructure and facilities in the form of inspection roads and river water level control structures.

Article 111 describes the direction of zoning regulations for flood-prone areas including permissible activities including reforestation activities, reforestation, establishment of embankment buildings, drainage, sluice gates, infiltration wells and biopore holes, and determining the location and path of evacuation of floods; activities that are permitted with conditions including activities other than as referred to in letter a which do not have the potential to cause a flood; activities that are not permitted include activities to change the flow of the river, including moving, narrowing and closing the flow of the river, activities to block and / or close locations and evacuation routes of disasters, and activities that have the potential to cause floods; and the provision of infrastructure and facilities.

3. Method

In this study, qualitative methods are used and carried out observations at the study site. In determining the location of the study, the location under study is in accordance with the formulation of the problem, namely: (1) The location is an unplanned settlement, (2) The location is a growing settlement on the riverbank and (3) The population is mostly migrants. Settlements on the banks of the Deli River Medan Labuhan Subdistrict meet these criteria.

In the process of determining the variable of research is carried out by interpreting the theoretical basis. The theoretical foundation is useful for answering the problem statement. Variables will be items
that will be used for data collection methods. The variables in this study are as follows: (1) population lifestyle, (2) social conditions, (3) economic conditions, (4) settlement morphology, (5) population growth, (6) home orientation (7) settlement patterns (8) physical form of residential area and (9) river border line. Data collection for variables in this study is obtained through interviews with residents of settlements, secondary data collection and direct observation.

4. Results and Discussions

4.1 Development of Settlements in Deli Riverside, Medan Labuhan Subdistrict

The beginning of the emergence of settlements in the Bantaran River area of Medan Labuhan Subdistrict began with the emergence of the kingdom of the Deli Sultanate in one of the districts of Medan Labuhan Subdistrict. Starting with settlements consisting of ethnic Malay residences. Then, it developed into a densely populated residential area because of the increasing number of migrants from other ethnic groups. In addition, this area is also an industrial area of Medan. The reason this city is an industrial area and settlement development is because it is located on the road to the Belawan Sea Port which is quite strategic for traders.

Migrants contributed to the formation of settlements on the banks of the Deli river in Medan Labuhan Subdistrict. The researcher identified the development of scholarship in 3 periods, namely the Sultanate period of Deli which had experienced the Dutch colonial period and the Japanese colonial period. Next is the period of Indonesian Independence and the reform period. The three periods were the focus of the Researcher’s attention because the period provided an overview of the development of unplanned waterfront settlements (figure 1).

![Diagram: Period of Development of Unplanned Settlements](image)

**Figure 1.** The period of the development of unplanned settlements on the banks of the Deli river in Medan Labuhan Subdistrict

During the Deli sultanate, settlements began with developments on the banks of the Deli river. The river is used as the main reference in supporting the activities of the Malay community. The main activity of society at this time is trading. Trade has resulted in other ethnic groups entering the Deli River region. So, it can be said that trade affects the form of settlements at this time.
There are five basic elements forming a settlement, namely nature (nature), man (human), society (society), shells (home), and networks (network or infrastructure) [2]. Nature has an important role for the people of the Deli Sultanate in choosing locations to build houses. Humans think of the natural part that is most appropriate for the position of the house to live. The period of the Deli Sultanate thought that the river was an important infrastructure provided by nature at that time. River as a network that connects one place to another in the era of the Deli Sultanate. Rivers are a part of nature that in people's minds can support life. The existence of the river as an important infrastructure becomes a community supporter for obtaining livelihoods, for example as fishermen and traders (figure 2).

Figure 2. The settlement of Bantaran Sungai Deli in the District of Medan Labuhan during the Deli Sultanate

During the independence period, Pekan Labuhan began to carry out development. Communities are given the right to obtain their freedom in the structure of society, government, economy, education and others. So, since 1950, Pekan Labuhan administratively was Labuhan Deli District (Deli Serdang District). In 1969 the status was upgraded to a village that was originally called kampung.

Lifestyle that forms a city organization then in the 1980s, lifestyle developed into the development of informal technology and communication, rapid change occurred with the growing establishment of factories, public education facilities, housing-housing from the simple to permanent residential areas with grouping which is bounded by towering walls seems to impress immigrants as an exclusive society for local residents [12]. Until now, the wall still exists as a separator between factories or shops with native community settlements. The original settlements of Malay caller houses began to disappear.

The development of settlements on the banks of the Deli River in Medan Labuhan Subdistrict is shown by developments towards the road formed. Settlements during the independence period developed into a part of the city of Medan. The development of the city of Medan at this time resulted in settlements developing towards the city of Medan (figure 3).

Figure 3. Bantaran River Deli Settlement in Medan Labuhan Sub-District during the Indonesian Independence

During the revolution, the government began to build dikes and plant grass on the banks of rivers along the Medan Labuhan sub-district. The government has made the river border line area as an area
of state-owned land. Where in the area people are prohibited from building, planting crops and livestock raising. In addition, the construction of factories and the Medan Industrial Zone (KIM). Whereas settlements are built behind factories and shop stores on the road to the port of Belawan.

Lifestyle that forms a city organization then in 1997, the development of settlements increased [12]. Migrants outside Medan started to build houses on the river banks of the deli in Medan Labuhan Subdistrict. Migrants with middle-low economic conditions and no land, they began to occupy state-owned land as land to build their homes. Whereas migrants with middle to upper economic conditions bought land from the indigenous people and built shop houses. The native people who sold the land also built houses on state-owned land and used the money they had from the sale of land for survival. In addition to migrants, indigenous people who remain in the area invite other families to live and build houses in a row.

The existence of houses in settlements along the Medan Labuhan river has also changed. At present, the existence of houses in settlements no longer considers the river as an orientation due to the development of cities towards the land area and in the end the river is used as a back area [11]. The river as the back of the building tends to occur on the banks of the Labuhan Deli riverbank. The building was built facing the river and built a gathering place near the river to relax in the afternoon. However, this is still used in the lower classes of society. Whereas the middle and upper class people are oriented to the big road, even making the part facing the river an area behind the house. The closer to the crossing area to the port of Belawan, the orientation of the house follows the pattern of the road formed in the residential area (figure 4).

![Figure 4. Bantaran Sungai Deli Settlement in Medan Labuhan Subdistrict in the present](image)

### 4.2 Factors Affecting Settlement Growth in Deli Riverside, Medan Labuhan Subdistrict

Based on the results of the development of Deli riverbanks settlements, Medan Labuhan Subdistrict, which consists of 3 development periods, the growth of settlements by life aspects. According to Eldefrawi in 2003, aspects of life that influenced the form and position of residence in settlements were social aspects and the economic level of the community. Meanwhile, according to Constantinos A. Doxiadis (1968: 21-35) there are five basic elements that regulate settlements, namely natural (natural), human (human), community (community), shells (house), and network (network or infrastructure). Therefore, these two theories will compare the factors that most influence the growth of settlements.

The increase in birth rates among family members resulted in Misba's mother's family developing and becoming several families. The social conditions that occur between these developing families. This forced the family to build a house on their inheritance. Then grow another family and build another house on the family's land. So, in a large plot can consist of several houses with family attachments. Families who own their own family land only socialize with each other. However, they do not or even rarely socialize with people who do not own other inhabited land. Other residents intended are residents who live on illegal land.
In the growth of Deli riverbanks settlement, Medan Labuhan sub-district also experienced by migrants (urbanization). The migrants along the Deli River Medan Medan sub-district have their own reasons for choosing to reside in the area. One of the migrants, Fatmawati, chose her place of residence due to low economic conditions. The high price of land makes some of the migrants look for cheap land. In fact, the migrants made government land to build their homes.

The social condition of the migrants began when they invited their relatives. They worked together to open vacant land and erect buildings. The location of the house between relatives is also close together. With the same economic and social conditions this also results in population growth. This population growth resulted in the growth of settlements on the banks of the Medan Labuhan subdistrict.

The migrants who have good economic conditions will look for suitable land to occupy. They will buy vacant land or buy a ready-made house. The reason for the migrants who have good economic conditions is to look for a place to live on the banks of the river Medan Labuhan sub-district that is close to relatives or workplaces. These migrants are migrants who have jobs as employees in one of the factories or other official offices.

**Figure 5.** The economic conditions and social conditions of the same family influence the growth of settlements.

**Figure 6.** The economic conditions and social conditions of the same migrants affect the growth of settlements.
4.3 Forms of Settlement Patterns in Deli Riverside, Medan Labuhan Subdistrict

4.3.1. Segment 1. In segment 1 of the residential area of the Deli River in Medan Labuhan Subdistrict, it is a large urban village and sub-district. Settlement settlements each segment has its own settlement form. The form of settlement patterns will be identified based on the theory [16] regarding the structure of residential space there are 3 patterns, namely linear, cluster and combination. (figure 7)

The form of settlement pattern in segment 1 in Bantaran River Deli, Medan Labuhan Subdistrict forms a linear pattern, cluster pattern and combination pattern. In the linear pattern, the linear axis is in the form of a river with its settlements on the banks of rivers that follow the river pattern. The linear pattern formed forms a simple and irregular settlement structure. But due to the development of settlements which increasingly moved away from the river, the pattern of settlements towards the land was also growing. The river for the local community is not the main transportation route to other areas so residents begin to stay away from the river.

In this linear pattern it has high density, and the tendency for settlement expansion and mixed use functions of land use varies [16]. The linear pattern of settlements that follow the linear river has a high degree of spiciness. The building that was built was also meeting with other houses. Most of the functions contained in the settlement are only as a place to live.

Figure 7. Settlement pattern segment 1.
4.3.2. Segment 2. In segment 2 of the residential area of the Deli River in Medan Labuhan Subdistrict, it is a sub-village, the village of Martubung and the village of Pekan Labuhan Deli. Settlement settlements each segment has its own settlement form. The form of settlement patterns will be identified based on [16] regarding the structure of residential space there are 3 patterns, namely linear, cluster and combination (figure 8).

**Figure 8.** Settlement pattern segment 2.

The form of settlement patterns in segment 2 in the Bantaran River Deli, Medan Labuhan Subdistrict forms a linear pattern, cluster pattern and combination pattern. In the liner pattern, the linear axis is in the form of a river with its settlements on the banks of rivers that follow the river pattern. The linear pattern formed forms a simple and irregular settlement structure. But due to the development of settlements which increasingly moved away from the river, the pattern of settlements towards the land was also growing. The river for the local community is not the main transportation route to other areas so residents begin to stay away from the river.

In this linear pattern it has high density, and the tendency for settlement expansion and mixed use functions of land use varies [16]. The linear pattern of settlements that follow the linear river has a high degree of spiciness. The building that was built was also meeting with other houses. Most of the functions contained in the settlement are only as a place to live.
4.3.3. Segment 3. In segment 3 of the settlement of the Deli River in Medan Labuhan Subdistrict, it is the village of Sei Mati, the village of Nelayan Indah and Kelurahan Pekan Labuhan Deli. Settlement settlements each segment has its own settlement form. The form of settlement patterns will be identified based on the theory [16] regarding the structure of residential space there are 3 patterns, namely linear, cluster and combination (figure 9).

![Figure 9. Settlement pattern segment 3.](image-url)

The form of settlement patterns in segment 3 in the Bantaran River Deli in Medan Labuhan Subdistrict forms a linear pattern, cluster pattern and combination pattern. In the liner pattern, the linear axis is in the form of a river with its settlements on the banks of rivers that follow the river pattern. The linear pattern formed forms a simple and irregular settlement structure. But due to the development of settlements which increasingly moved away from the river, the pattern of settlements towards the land was also growing. The river for the local community is not the main transportation route to other areas so residents begin to stay away from the river.

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4.4 Typology of Residential Areas on the Settlement in the Deli Riverside, Kecamatan Medan Labuhan

The typology of residential areas of Deli along the riverbanks of Medan Labuhan sub-district was analyzed using the Kauko theory in 2009. Kauko in 2009 stated that the physical form of the residential area consists of the type of dwelling, wide riverside open spaces, riverbank construction, open spaces and riverbank access. Each physical form of the residential area has its own attributes. Thus, each segment in
the Deli riverbanks settlement in Medan Labuhan District will be analyzed based on each physical form of the residential area by Kauko in 2009.

Analysis of open space and roads in the typology of residential areas along the riverbank Deli Deli Subdistrict Medan Labuhan uses the Eldefrawi theory in 2003. Eldefrawi states residents of unplanned settlements allow several activities, namely streets as houses, streets as expanded work spaces, streets as expanded cafes, streets as an extended celebration venue and the streets as a playground. Thus, the physical form of open space in each segment will be analyzed by Eldefrawi in 2003.

4.4.1. Segment 1. The typology of house number 1 is a house that faces back to the toll road which is a 1-story and 2-storey house using zinc, concrete and wood. The typology of house number 2 on Yos Sudarso street is a shop house (shop house) that lines in one line. House typology number 3 which is located on the edge of the first floor of a deli house with materials such as tepas, zinc and wood. Typology of house number 4 which is in a housing complex: tiered house 1. Typology of house number 5 which is near the railroad tracks ap1: house with floor 1 with wood, tepas and zinc.

Information:
- River
- Road
- Settlement
- Factory
- Public service facilities
- Railway

Figure 10. Type 1 residential area in segment 1 of the Deli riverbanks settlement, Medan Labuhan District
Segment 1 has an open space that has a width of 21-30 meters and is used as a community reading garden.

**Figure 11.** Open space segment 1 in Deli riverbanks settlement Medan Labuhan District

The A-A Section of embankment is 3 meters high

The B-B’ Section of embankment

**Figure 12.** Construction of riverbank segment 1 in Deli riverbanks settlement, Medan Labuhan District.

4.4.2. Segment 2. The typology of the house at number 1 which is near the railroad tracks is a one-story house with wooden, tepas and zinc materials. The typology of houses in numbers 2 and 3 located on Jalan Yos Sudarso is a shop house (shop house) that lines in one line. In number 4, the type of apartment
residential area is in the form of flats. The type of residential area in number 5 is the market area of the 1st floor and 2 storey highway harbor.

**Figure 13.** Type 2 residential area in segment 2 of the Deli riverbanks settlement, Medan Labuhan District.
Segment 2 has an open space that has a width of 10-20 meters and used as a field but has not been treated in such a way.

**Figure 14.** Open space segment 2 in Deli riverbanks settlement Medan Labuhan District.

**Figure 15.** Construction of riverbank segment 2 in Deli riverbanks settlement, Medan Labuhan District.

4.4.3. Segment 3. The type of residential area at number 1 on the river bank is a stilted house with wooden material. The typology of the house at number 2 which is in a housing complex is a 1-story
house. The type of residential area at number 3 is the river bank, a house with wooden material. Type 4 residential area on the river bank is a wooden house.

**Figure 16.** Type 3 residential area in segment 3 of the Deli riverbanks settlement, Medan Labuhan District.
Segment 3 has an open space that has a width of less than 10 meters and is used as a garden space in the harbor field.

**Figure 17.** Open space segment 3 in Deli riverbanks settlement Medan Labuhan District.

**Figure 18.** Construction of riverbank segment 3 in Deli riverbanks settlement, Medan Labuhan District.
4.5 Factors Influencing the Form of Settlement in the Deli Riverside, Kecamatan Medan Labuhan

Forms Settlement patterns are not formed by themselves but through processes and are influenced by several factors. Factors of settlement pattern formation (Abdullah, 2000), namely:

1. Social
   In the residents of the settlement of the Deli riverbank in Medan Labuhan Subdistrict, social factors greatly influence the form of settlements. Residents feel they have one attachment to each other. Our relatives and families are invited to build houses in settlements on the banks of the Deli River in Medan Labuhan Subdistrict. Thus, the form of settlements that are created forms a cluster or house in one plot.

2. Economy
   Economic conditions affect the formation of residential areas than people who choose to live on the banks of the Deli river in Medan Labuhan Subdistrict. Communities with low economic conditions have low quality housing. The material used is material waste from the construction of a new residence. Land that is used as a place to live is government land. While the upper middle class people have a fairly good residential quality. The material used is a new material that has good quality. The land occupied is also land belonging to a family or land that has a building permit.

3. Technology
   The development of the era has an influence in forming settlements. In the past, the residential type of the Medan Labuhan Kecamatan riverbank settlement was the type of house on stilts. Materials that are mostly used are wood and tepas. Whereas at the present time, the development of increasingly advanced technology makes the existence of stilt houses began to disappear. Many people have switched to solid concrete materials and strong tile roofs. Laying the house also began to follow the
existence of the river Deli. The orientation of the house began to make the street Yos Sudarso as the main reference.

1. Culture

Indonesia has a variety of tribes. Most of the ethnic groups in the settlement of the Deli river in Medan Labuhan Subdistrict consist of ethnic Chinese and Malays. This ethnic difference makes the Deli riverbank settlement have a variety of building typologies. The Chinese ethnic community built buildings based on feng shui beliefs. Based on one statement by Ms. Anis that one Chinese community does not want any residents to build a house to live behind her house. That is because trust that says fortune will be hampered if there is a house built behind the house.

2. Physical form of nature

The topography of the settlement of the Medan Labuhan subdistrict river has an influence in forming settlements. The physical form of nature that has been formed from the beginning is flat land. The settlement of riverbanks on flat land is constructed by embankments. People who build houses on the government land often build houses on sloping land. That made the door of the house half a part of the river embankment.

6. Availability of infrastructure

Public infrastructure in settlements in Medan Labuhan Subdistrict affects the formation of settlements. The community will try to build residential houses close to the infrastructure. The closer it is to infrastructure, the community does not spend much on transportation.

4.6 Context of the Settlement Concept in Deli Riverside, Medan Labuhan Subdistrict

The formulation of the concept of structuring river bank deli suburbs in Medan Labuhan District was obtained based on the river culture in the deli community and based on the regulations of Government Regulations related to Riverbank Development in Medan City and Indonesia. The settlement arrangement is divided into 4, namely:

1. Arrangement of Circulation System

Access road settlements along the river will be linked to the main access without reducing the functions and applicable regulations. Roadwork that suits the comfort, smoothness, safety of users. Road improvements were made to the main access or settlement access. River transportation, which is a major element in river culture, is improved, including facilities and infrastructure, and lanes for public transportation such as water buses and water taxis and routes for tourist transportation and promotion. The development of this transportation system will affect the economic system on the river and can reduce costs for road infrastructure.

2. Arrangement of Settlement Activities

a. Means of Economic Activity

Economic activity in the river which is also one of the factors of the people to live in settlements. The economic activities are arranged by making the area free of occupancy which is used as a location for shanties, according to the amount of existing residents' quota

b. Social Space

Social spaces are placed in village halls at several points. The function of social space is used. As a forum for citizens to socialize among residents so that a sense of togetherness grows. The social space can be used as a place for people to do activities such as celebrating celebrations.

3. Settlement of settlements

a. The mass of the building

Structuring of settlements on the riverbanks by maintaining the existing pattern of building mass but by stopping new construction towards the river and stopping the growth of new settlements on the riverbanks. The transfer of illegal settlers from illegal buildings and less than 50 years old by the river to a model of lanting settlements with buoyant construction updated according to new
technology. The appearance of the building which is located on the riverbank has two orientation directions, namely to the river and to the mainland. The period of the building vertically.

b. Green open space placed between the mass of buildings in the settlement. Open space also functions as a place for citizens to interact and as a public dock.

4. Arrangement and Control of the Environment
   a. River Borderline
      The function of the river is not disturbed by the activities that develop around it. Utilization activities and efforts to increase the value of the benefits of existing resources in the river can provide optimal results while preserving the function of the river. Damage to rivers and their environment can be limited.
   b. Environment sanitation
      Environmental sanitation has an impact on river quality improved by maintaining old sanitation patterns using rods or rafts but with a treatment system that has been developed, namely the pipeline system with communal septic tank.
   c. River ecosystems
      River ecosystems are maintained by controlling river sedimentation and maintaining river cleanliness. This control is by improving the river bank environment in the form of replanting vegetation typical river banks, river water quality research periodically, improving the waste system and awareness of the importance of river cleanliness to the community. Control of shipment waste is carried out by periodic cleaning of rubbish and the application of the Garbage Perda and strict environmental laws against the community.

5. Findings
   Based on the results of data analysis and the relationship with the theoretical foundation that people choose to live in Medan Labuhan due to the same economic and social conditions. It can be said that the main factor influencing the growth of settlements in Bantaran Sungai Deli, Medan Labuhan District, is the social aspect. Although the settlement elements are complete in the area but without any relatives or family, the community does not choose to live in settlements in Bantaran Sungai Deli, Medan Labuhan District. These factors are obtained from the history of the development of settlements in the Bantaran Sungai Deli, Medan Labuhan District. The history of development is divided into 3 periods, the Deli Sultanate, the period after Indonesian independence and the reform era and now. Factors that influence the form of settlements in the Deli Sungai Labuhan Subdistrict Medan Labuhan consist of: Social, Economic, Technology, Culture, Physical form of nature, and Availability of Infrastructure. Typology of deli riverbank settlement, Medan Labuhan Subdistrict, consists of row houses, floating houses and apartments or flats. The formulation of the concept of structuring the riverbanks of Deli Deli Sub-district of Medan Labuhan was obtained based on the culture of the rivers that existed in the deli community and based on Government Regulations related to River Bank Development in Medan City and Indonesia. Settlement structuring is divided into 4 namely: (1) Arrangement of Circulation System, (2) Arrangement of Settlement Activities (3) Settlement Arrangement (4) Arrangement and Control of the Environment

6. Conclusion
   The development of the deli riverbanks settlement of Medan Labuhan Subdistrict consists of 3 periods, namely the sultanate of deli, the period after Indonesian independence and the reform period until now. The development of Deli riverbanks along the Medan Labuhan sub-district is caused by the same economic conditions and social conditions. The same economic conditions and social conditions result in the form of settlements based on population grouping based on the same conditions. The grouping of settlements that formed nature is available. Nature is in the form of river banks.
   The development of deli riverbanks settlement of Medan Labuhan Subdistrict until now has produced typology of residential areas in Deli riverbanks settlement, Medan Labuhan Subdistrict,
consisting of series houses, floating houses and apartments or flats. Most types of residential areas consist of series houses. The width of the open space on the river bank exceeds 30 meters and is used as green open space. In the river construction section, a dike was built as a flood barrier. The area of the embankment is also different in each segment. While access to the river only consists of a footbridge which is located in Pekan Labuhan Kelurahan. Each segment has a different type of residential area typology. That is due to differences in river typology in each segment resulting in different forms of settlements and residential areas.

The form of settlement patterns consists of clusters, linear and combination. The form of settlement needs to be developed by the government to be more organized. Equal distribution of residential areas irregularly results in different shapes for each segment. In segments 2 and 3 of the residential area there are dense parts, while there are parts that are still empty. The formation of these settlements is caused by social, economic, technological, cultural, natural physical forms and the availability of infrastructure. To obtain the concept of structuring which is characterized by river culture, it is necessary to have settlement growth factors with factors that influence the form of settlement. The formulation of the concept of structuring the riverbanks of Deli Deli Sub-district of Medan Labuhan was obtained based on the culture of the rivers that existed in the deli community and based on Government Regulations related to River Bank Development in Medan City and Indonesia. Settlement structuring is divided into the structuring of the Circulation System, structuring of settlement Settlement Activities, and Environmental Management and Control.

Arrangement of the circulation system is an improvement access to residential roads along the river that connects the main access. Other arrangements is reviving river transportation that used as tourist transportation. Arrangement of settlement activities is making residential free areas used as places to sell. Activities for social spaces include the placement of village halls at several points. In settlement arrangement, the building mass is built vertically. This vertical housing is useful for illegal residents who cannot buy land. Thus, even distribution of residential areas in Medan Labuhan settlements can be balanced by reviving the economic and social activities of the community.

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