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COASTAL SETTLEMENT PATTERNS: A CASE STUDY AT GAMPONG TELAGA TUJUH, LANGSA

Suci Yulisma¹, Dwira Nirfalini Aulia², Wahyu Utami³

¹Architecture Post Graduate Programme, Faculty of Engineering, Universitas Sumatera Utara
Dr. Mansur Street, Medan, 20155, Indonesia

²Architecture Post Graduate Programme, Faculty of Engineering, Universitas Sumatera Utara
Dr. Mansur Street, Medan, 20155, Indonesia

³Architecture Post Graduate Programme, Faculty of Engineering, Universitas Sumatera Utara
Dr. Mansur Street, Medan, 20155, Indonesia

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ABSTRACT

The aims of this study is to understand the characteristics, the settlement patterns, and the causes of coastal settlement pattern formation in Gampong Telaga Tujuh. This study applies a descriptive qualitative research method, which describes the conditions related to the settlements to provide the answers of this study. The primary data is employed as a basis for research using a quantitative approach and the secondary data is employed as supporting material in this study. The findings show that the characteristics of the settlement of Gampong Telaga Tujuh are the seaside settlements with the majority are fishermen without adequate infrastructure. The topography of the settlement has formed an area with a building on stilts above the water level, a tidal transition area and a land area with the orientation the building facing the road, facing the sea and facing the back of the building. The settlement pattern is a combination pattern where there is a linear pattern of parallel buildings which follow the road network, as well as the cluster or group settlement patterns. The cause of the settlement patterns formation in Gampong Telaga Tujuh is caused by human or community cultural interactions toward nature, namely the sea.

KEYWORDS: Characteristics, Pattern, Settlement, Coast

1. INTRODUCTION

Indonesia is an archipelagic country with two-thirds of sea area is larger than the land, there are more than 17,000 islands, but only 35% are inhabited and form a settlement. Based on Law No. 1 year 2011 settlements are part of the environment outside protected areas, both in the form of urban and rural areas, which can function as a living environment or a residential environment as well as a place for activities that can support life and livelihoods [1]. A settlement should follow the criteria for a good settlement by fulfilling physical and non-physical aspects [3], basic elements such as man, society,

shell, network must reach a balanced point so that [6], can create settlements ideal and the creation of the quality of life of the community itself [2].

A settlement grows in an environment that has resources such as water, then grows in groups and forms a center [12]. A settlement is influenced by income level, security, identity, occupancy standards, and home ownership rights [9]. The main priority for low-income individuals is the easiness of workplaces access and their socio-cultural interactions. A settlement which grow near water has its own characteristics and is a very accommodating area for humans to live and doing business [12].

Gampong Telaga Tujuh is one of the slum settlements in Langsa with 6.26 hectares concentrated in the coastal sea areawhich is directly adjacent to the Malacca Strait. It has been around since 1902 and continues to experience physical regional development. Unfortunately, the development is not supported by the fulfillment of proper housing infrastructure. Consequently, the settlement conditions have experienced an increase in sea level entering the land which can affect the settlement and the environmental conditions.

The dependence of the community toward the seaside will affect the pattern of its settlement. The spatial patterns of coastal settlements have different forms according to their ecological characteristics and growth processes [4]. The coastal development can raises problems, including extremely dense settlements, not patterned and ignoring the policies of the arrangement of waterfront areas, therefore the settlement develops irregularly, densely and damaging the environment [3]. The increase of human activity along with the development of the area also affects the shape and pattern of coastal settlements in Gampong Telaga Tujuh, therefore a study of settlement conditions is performed to analyze the characteristics, the settlement patterns and the causes of settlement pattern.

2. LITERATURE REVIEW

Settlements are defined as housing for humans, to meet the needs of human life as a place to live and live [3]. Occupancy for some people is not only a place to live but can function widely as a place to work, study, gather, socialize, and activities that support survival [8]. A settlement should follow the criteria for a good settlement, by fulfilling the physical and non-physical aspects. Physical and non-physical aspects influence each other as a form of inseparable aspects [15].

Characteristics or characteristics of housing in coastal areas are seen from the appearance of the building, which is divided into two, namely buildings that stand on land by the sea and above sea level [4]. Architecturally the form of buildings in settlements in coastal cities consists of buildings on the land, stilt buildings on the land, stilt buildings on water, and raft buildings on the water. The need for land use for settlements will continue to increase as the population increases, so this can affect the pattern of distribution of settlements on the type of building, the orientation of the building, and the quality of the building to be irregular [1]. A healthy residential environment is an environment consisting of a collection of healthy houses that are regularly layout and have adequate environmental

infrastructure and facilities [10].

In general, settlement patterns will follow a socio-cultural system that is influenced by patterns of human activity. The settlement pattern of fishing villages will generally follow the coastline or linear with conditions that tend to be homogeneous, closed and develop certain traditions so that they have the characteristics of settlements [19]. The formation of the coastal area process is influenced by aspects of environmental conditions, socio-cultural aspects, economic aspects, population aspects and government policy aspects. The most influential aspects in the formation of waterfront settlements are socio-cultural and environmental aspects. So that culture will be reflected in the form of settlements [10].

The life and activities of fishing communities are an interesting factor in the growth and development of fishing settlements. This condition is caused by the homogeneity of the fishermen population who have the same characteristics of community life that refer to the profession as fishermen, whose lives are shiny in the sea that is in the area [6]. The link between culture and housing is one of the elements that make up settlements where the house can not only be seen as a physical form consisting of a series of structures but is a form of the cultural phenomenon that comes from the social environment owned [7]. Not only that, people's beliefs or perspectives will greatly influence the formation of nature which is always developing and influenced by culture. Culture with a belief system as a human balance in taking action against nature with the subsequent process being part of changes in the shape of nature, space and or areas which ultimately form the culture of a particular society. The development of community culture and natural forms will always occur and be a unique process as a form of human interaction with nature to achieve a balance point that is influenced by space and time [13]. Socio-cultural characteristics have an influence on the pattern of fishermen's settlements, namely economic conditions and livelihoods, social organization, and religious beliefs [6].

3. RESEARCH METHODOLOGY

This study is conducted to understand the characteristics, the settlement patterns and the cause of coastal settlement pattern formation. A descriptive qualitative research with a case study approach is employed in this study. This study describes the conditions associated with settlement conditions which are expected to provide the answers in this study regarding the characteristics, the settlement patterns and the causes of settlement patterns in the coastal areas of the sea. This study is located in Gampong Telaga Tujuh, Langsa Barat District, Langsa City, Aceh. This area is selected based on its geographical conditions which have characteristics of coastal areas, characteristics of land areas, number of inhabitants and residential areas. This study uses purposive sampling method where only people who really understand the conditions of the patterns and the characteristics of coastal settlements are selected as respondents. The people who become the respondents are permanent residents, community leaders and village heads. The data collection process is performed in three stages, namely literature studies, field observations and direct interviews with residents of the settlements. inductively using in-depth interview techniques. In conducting the analysis, the researcher

connected the results of the field data obtained with the theoretical basis to produce discovery and then make a conclusion.

4. RESULT AND DISCUSSION

4.1 The Settlement Characteristics

Gampong Telaga Tujuh is one of the villages located in Langsa City, precisely in Aceh Province, Indonesia which is a coastal residential area located at $4^{\circ} 33' 2,687''$ - $4^{\circ} 33' 9,726''$ North Latitude and $98^{\circ} 3' 51,656''$ E - $98^{\circ} 3' 58,216''$ East Longitude with 1,621 population. This residential area is 6.20 hectares and divided into five hamlets. The settlement is on an offshore island, where the residential area is surrounded by the sea which is the Malacca Strait.



Figure 1: Study location in Gampong Telaga Tujuh

4.1.1 Physical Nature

The settlement area of Gampong Telaga Tujuh is located on an altitude of less than 10 meters above the sea level, a coastal area with white sandy andosol soils. The current condition is experiencing coastal abrasion due to the breaking of the 12 km long shoreline, consequently the tide will inundate parts of the residential area from 8 AM to 2 PM, and this condition depends on the tides of the sea water at different times. This will certainly affect the safety of residential areas. It is known that those natural conditions are prone to abrasion cause physical changes in settlements, where the initial surface of the land is large and there are several buildings in this area that are damaged by the brunt of the sea waves, so that the houses around the embankment which are now no longer exist, this condition has occurred since 2014, therefore in 2011 and 2019 a 476.56-meter-long wave dike was built to prevent sea waves and prevent abrasion. However, if the sea water intensity is too high, usually in October, the sea water will enter some of the houses.

4.1.2 Physical Building Condition

Based on the condition of the settlement area of Gampong Telaga Tujuh which is surrounded by the sea, it was found that the division of settlement zones was, above sea water zone, tidal transition zone and land area zone. Another characteristic is that almost every front of the building is equipped with a small staircase to reach the house and part of the front of the house is directly connected by a wooden bridge to the road. The purpose of the stilts is to avoid flooding or tides from sea water with aims water cannot reach the surface of the house which can damage building construction.

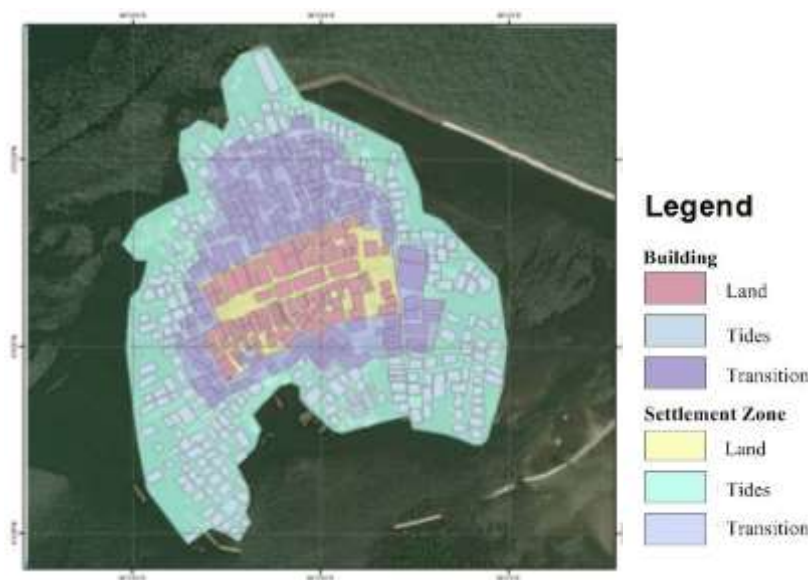


Figure 2: The settlement zone

The area zone, the building that is above the water level is in the form of a stilt building with a higher foundation pole, which is about 1-2 meters. In the tidal transition zone, the foundation of the stilted building is shorter than the zone above the water, namely the foundation pole. about 50 cm - 1 meter due to its higher topography, while the land zone is the area with the highest topography in the Telaga Tujuh settlement, there is a difference in the height of the foundation compared to the zone in the tidal transition area and buildings on water, with a foundation length of only about 30-50 centimeters

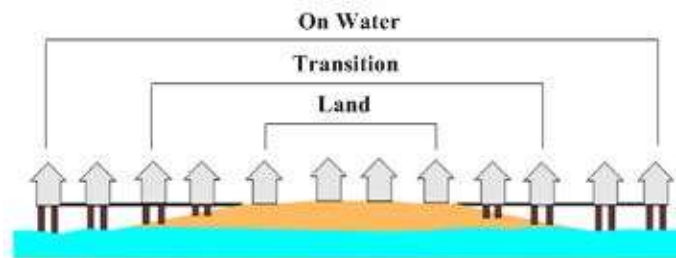


Figure 3: Illustration of Settlement Zone

4.1.3 Facilities and Infrastructure Condition

The settlement of this area can only be reached by sea transportation for 30 minutes from Kuala Langsa port. This area does not have direct access for clean water, they have to buy water and transport it home by cart. The majority of people do not have toilets and use public toilets which in unsuitable conditions and discharge their waste directly into the sea. There are several piles of rubbish that are in front of or under people's houses, some of the garbage is burned, but still many throw the garbage directly into the sea.



Figure 4: (a) Transportation, (b) Public toilets, (c) Garbage, (d) Clean water system

The availability of public and social facilities in Gampong Telaga Tujuh, namely kindergarten facilities located in Sentosa Hamlet, Elementary Schools located in Rukun Hamlet and Junior High Schools located in Damai Hamlet, worship facilities namely mosques located in Rukun Hamlet. There are also office facilities, namely the Geuchik Office along with a community meeting hall and community health centers as well as a power plant which in good condition



Figure 5: Facilities and infrastructure distribution of Gampong Telaga Tujuh

4.1.4 Socio-Culture Condition

The cultural activities that are still performed until now are Kenduri of the Prophet's birthday and Kenduri laot, this is because the community of Gampong Telaga Tujuh is inhabited by 90% of Acehese tribal communities which this condition will affect the traditional activities and activities of the community. The kenduri laot event will usually be held every 2 (two) years and is usually held in July. in the form of food alms, donations to orphans, and the cutting of buffalo/ox heads, which after that will be put into fishing boats decorated with seven kinds of flowers and water from seven water sources taken around the area. With the aim that when the fishing season arrives, the fishermen will get quite a lot of catch and always get safety when they go to sea. Educationally, the community have relatively low level of education, it is proof by many of them who do not go to school, only 28% of are graduated from junior high school (SMP) and elementary school (SD) around 14%.

4.1.5 Economic Condition

Settlements are located in offshore areas that are rich in marine products, therefore the Telaga Tujuh settlement community is known as a fishing community. Based on the results of the interview, it is known that all the heads of the community's families here work as fishermen. Community dependence on marine waters is very high because their main livelihood is fishing, which is also their main source of income. From the industrial sector of the community, Gampong Telaga Tujuh is known as the salted fish preservation industry on a home scale. Where the catch of fish from fishermen will be collected and sold, but some of the fish will be salted and dried in the process of making it by mothers. Especially for the preservation of salted fish, there is a seasonal nature, which will be produced every time there is fish caught from fishermen and the community relies on the sun in the drying process. However,

during the rainy season, the production of salted fish from the community will decrease. With this salted fish preservation business, it can support and increase the income and economy of the Gampong Telaga Tujuh community.

Table 1: Total Population by Employment at Gampong Telaga Tujuh

No	Occupation	Total
1	Not Working	258
2	Midwives, Nurses and Pharmacists	3
3	Freelance Day Labor	97
4	Taking Care of the Household	569
5	Fishermen	602
6	Traders	23
7	housekeeper	9
	Jumlah	1561

Source: Settlement Profile



Figure 6: (a) Fishermen's catch, (b) Salted fish preservation industry

4.2 The Settlement Form and Pattern

4.2.1 Building Orientation

The orientation of the building is the direction of the building, the environmental conditions of the Gampong Telaga Tujuh settlement are an island surrounded by the sea, people with a livelihood as fishermen make buildings around the waterfront oriented towards the sea, this is because the sea is an important part of the community's economy. Accessibility to buildings that are oriented towards the sea in the form of bridges made of wood ending with a boat or boat leaning on the front or side of the building, making it easier for fishermen to transport marine catches.

Most of the orientation of buildings in Gampong Telaga Tujuh faces the road, this condition follows the orientation of existing buildings and roads. In addition, there is also an orientation of buildings facing other buildings or facing the back of other buildings in groups, due to the increasingly limited availability of land which is exacerbated by abrasion which causes the residential area to shrink.

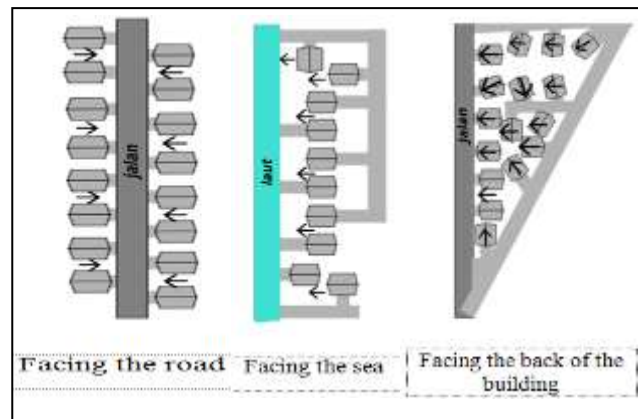


Figure 7: Illustration building orientation

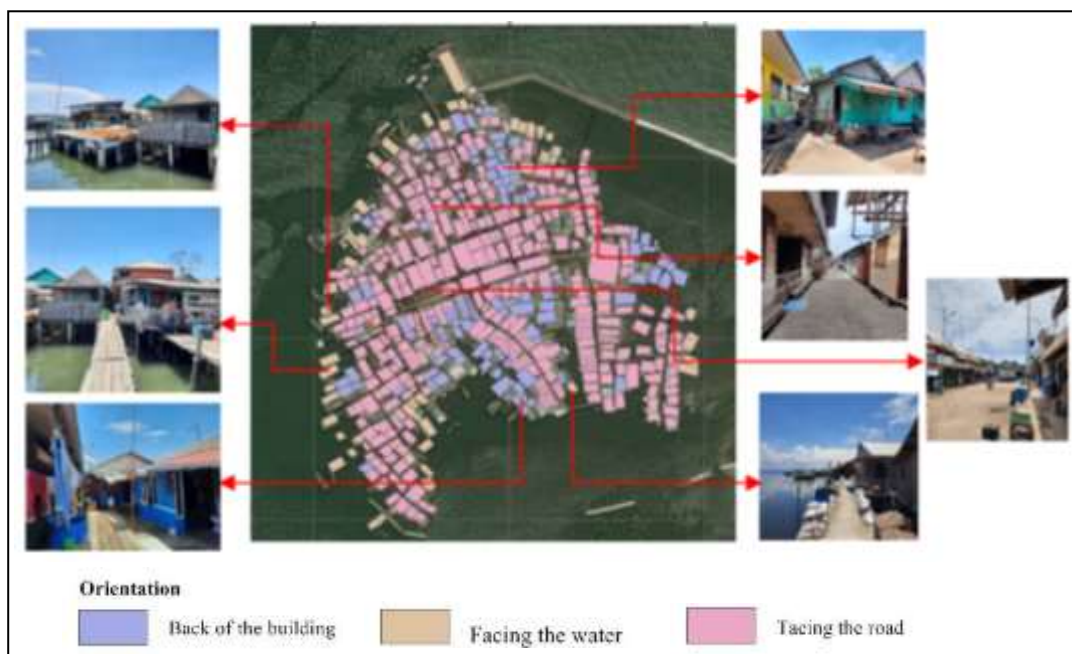


Figure 8: Orientation map of Gampong Telaga Tujuh

4.2.2 Road Network Pattern

The road network pattern is an appearance of the road structure formed from the physical appearance or the structure of the main network and the dimensions of the road (road width). The Gampong Telaga Tujuh road network pattern is a spinal, where the main residential road is at the center of the area and develops spread out with forked roads connecting to other roads. This road circulation also functions as a social space, where people often use the corridors as a place to interaction as well as a place to relax.

Taylor (1980) states that the settlement pattern consists of two, namely sub-communities (clusters) consisting of several units or groups of residential units centered on an important space, and face-to-face where the settlement pattern is linear, between residential building units along with the settlement and sequentially. linear to the center position. From the settlement conditions, the settlement pattern in this area consists of a combination residential structure, namely linear where the building pattern follows the orientation of the road, especially in the transitional and mainland areas. Meanwhile, the house pattern located in the water area is partly oriented to the sea and faces the back of the building or in groups. The road network pattern that is branched and irregular which affects the settlement pattern due to the house will connect or connected directly to the road circulation

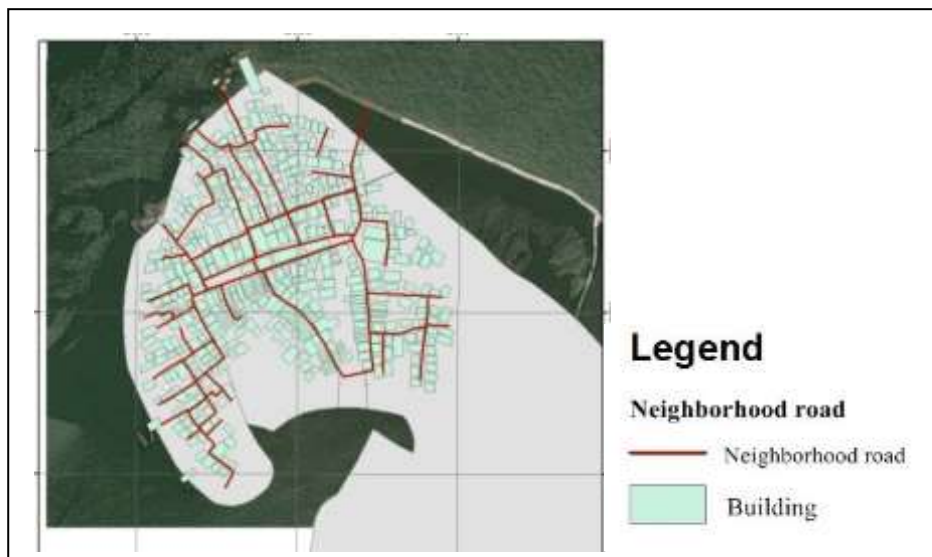


Figure 9: Road network pattern of Gampong Telaga Tujuh



Figure 10: The settlement form and pattern of Gampong Telaga Tujuh

4.3 The Cause of Settlement Pattern Formation

A settlement location is influenced by the availability of fertile soil and its availability of water sources [5]. Topography and administratively, Gampong Telaga Tujuh is a residential area surrounded by the sea with various marine natural resources. Located on the edge of the water, the settlement pattern of this area is partly formed with an orientation of facing the sea, due to the majority who are fishermen must be able to directly monitor the condition of the sea related to climatic as a consideration whether they should go to sea or not. The settlement pattern is formed and inspired by the nature and the surrounding environment, where the beliefs and conditions of the settlement make the community as fishermen bound and connected to the sea itself which is the main source of livelihood and source of community life.

People's beliefs or perspectives will greatly influence the formation of nature which is always developing and influenced by culture [13]. Being on the water's edge, the settlement pattern of Gampong Telaga Tujuh which is located on the water's edge is partially oriented towards the sea, this is because the majority of people who are fishermen must be able to see directly the state of the sea related to climatic conditions to ensure they will go to sea or not.

The settlement pattern in Gampong Telaga Tujuh is formed and inspired by nature and the surrounding environment, where the beliefs and conditions of settlements surrounded by the sea make the community as fishermen bound and connected to the sea itself. This settlement pattern is also formed

cannot be separated from economic factors which are the main source of livelihood for the main community by looking for fish in the sea and also a source of community life.

5. CONCLUSION

Based on the analysis, it is found that the characteristics of the settlement of Gampong Telaga Tujuh are settlements with fishermen as the majority. The infrastructure is available in inadequate condition. The majority of fishing communities with Acehnese tribes influence the cultural activities of the community with the presence of Kenduri Laot, which has been carried out from generation to generation until now. The uniqueness of this area are; it is located by the sea with its topography causing the area to become a land zone, a tidal transition zone and an area above water and has formed three housing orientation, namely the orientation of the building facing the road, the orientation of the building facing the sea and orientation of the building facing the back of the building. The settlement pattern structure in this area is a combination pattern where there is a linear pattern of parallel buildings which follow the road network, as well as cluster settlement patterns. The community's belief toward the sea and water has made some buildings settlements oriented to it, due to fishermen depend on sea conditions to fulfill their daily life and activities. As a result, the cause of settlement patterns in Gampong Telaga Tujuh is caused by human or community cultural interactions with nature, namely the sea and economic factors also influence the formation of settlement patterns where the sea is the main source of livelihood for the community.

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Author Profile

Suci Yulisma received the B.Eng. degrees in Urban and Regional Planning from Medan Institute of Technology in 2014, The student of Architecture Post Graduate Programme, Faculty of Engineering, Universitas Sumatera Utara.