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Transportation and Housing Infrastructure Concept Based on The Seaweed Processing and Industry

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Abstract: The seaweed processing industries have a high growth in Indonesia as a maritime country. The most of the regencies in coastal areas show seaweed processing activities, including Bantaeng Regency in South Sulawesi. This study aims to: 1) Describe the transportation of integration among housings, facilities and industries; 2) analysis the transportation connectivity system which supports housing activities based on the Seaweed Processing and Industry; 3) porpose the transportation and housing Infrastructure Concept based on the Seaweed Processing and Industry. The data were collected from direct observation and interview. The method of this analysis is using descriptive qualitative, comparative study with the proper standard and spatial analysis. The results show that; 1) there is no integration among housings, facilities and industrial areas. All of them are placed separatedly; 2) the transportation connectivity can only serve a traditional mobility of seaweed production type. 3) the concept proposed in two types: First, the linear and concentric shape in sub-district scale. Second, the concentric shapes in district sc*ale.*
Kywords: Seaweed, Transportation, Housing

I. INTRODUCTION

The seaweed processing activities take place in two types of location (water and land) in Bantaeng Regency coastal area. The seed plantation occurs in the sea (water) and the binding as well as the drying process occur around the fishermen housing neighbourhood (land). Therefore, moorings and boats can be seen along the shorelines. On the other side, the drying containers and binding activities appear around the fisherman housing neighbourhood.

In planting seasons most of the fishermen and their families do the binding activities around the housing neighbourhoods. In harvest seasons the activities are going intensed. Fishermen carry their produces from the sea to the land for drying process (See Figure 1). Consequently, the moving process from the sea to dry land or vice versa causes some problems.

Figure 1. The Illustration of the seaweed processing activities

The typical of geography in Bantaeng coastal area set along with a major road (arterial road). Fishermen have to cross the main road when moving their harvest products from the sea. The process of carrying the harvests is using a traditional method, like manual lifting or using a handcart. Moreover, in some cases, the locations of housings and drying ares placed in the opposite way of the shoreline where it is used for unloading activities. In the safety point of view, these activities can potentially cause danger. Another thing to point out is the seaweed processing activities take over the precious coastal area within 32 kilometers long, while 14 kilometers by 32 kilometers long are located in the city center.

Ideally, the industrial location should be placed integrated to each other and supported by transportation infrastructure. If this idea is implemented, the efficiency in logistic distribution can be achieved (Weber in Rustiadi, 2011).

The idea of the transportation issue is related to the seaweed processing activities causing some interesting points to be discussed as the aims to this study, i.e; 1) describe the transportation of infrastructure integration among housings, facilities and industries, 2) analysis the transportation connectivity system which support housing activities based on the Seaweed Processing and Industry; 3) Propose the housing transportation infrastructure concept based on the Seaweed Processing and Industry.

II. LITERATURE REVIEW

Housing and Settlement Pattern

According to Alibasyah (1989), some types of housing patterns described as follows:

a. Clustered, the pattern of a housing site surrounds the center of activities.
b. Sporadic, spread irregularly with a variety of distances to the center of activities
c. Linear, the housing site follows the coastlines/shorelines.

Further, some requirements in housing development and settlement in coastal areas are:

a. The distance between buildings. Considering the sunlight and proper air circulation
b. The distance between buildings and streets to support the traffic flows, the safety, reducing the pollution and noise
c. The distance between buildings and the beaches used as a preservation of the beach environment.
d. The infrastructure supply to support the need for a better life quality.

Industrial Locations Criteria

Weber in Rustiadi et al (2011), describes that thep lacing industrial location as an agglomeration area can help reduce production and transport cost. Wunas et al (2014), describes that the distance, time and easy access are considerable factors. Therefore the seaweed activity area need to be closed to the planting areas.

According to Llewelyn and Davies (2007), planning an area on neighbourhood scale should be made feasible for for the local community to access daily facilities by walking. Furthermore, a zoning plan should clear the fix boundary of the development areas for further detailed designs.

According to the brief literature, the research framework is described in Figure 2.

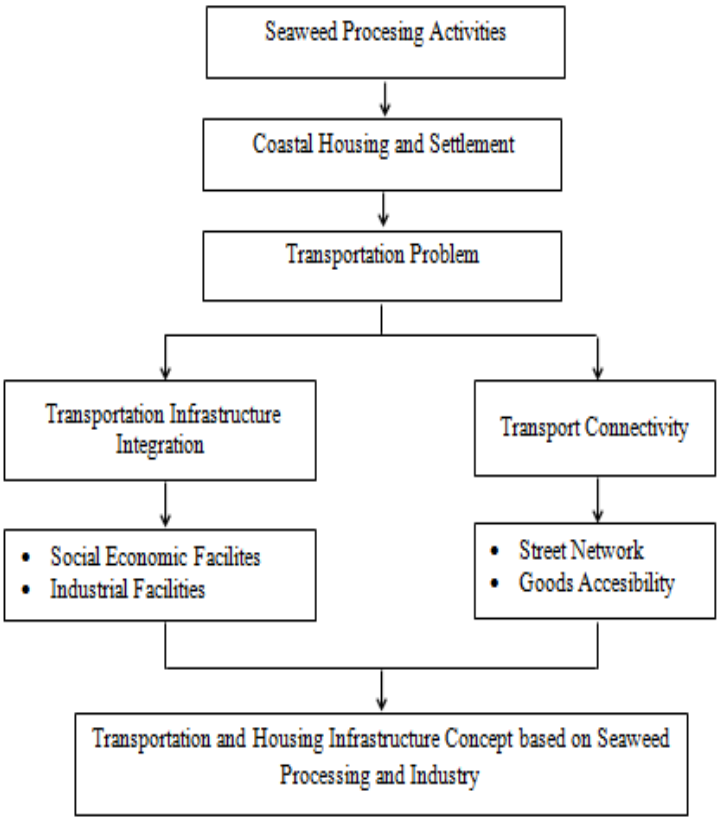
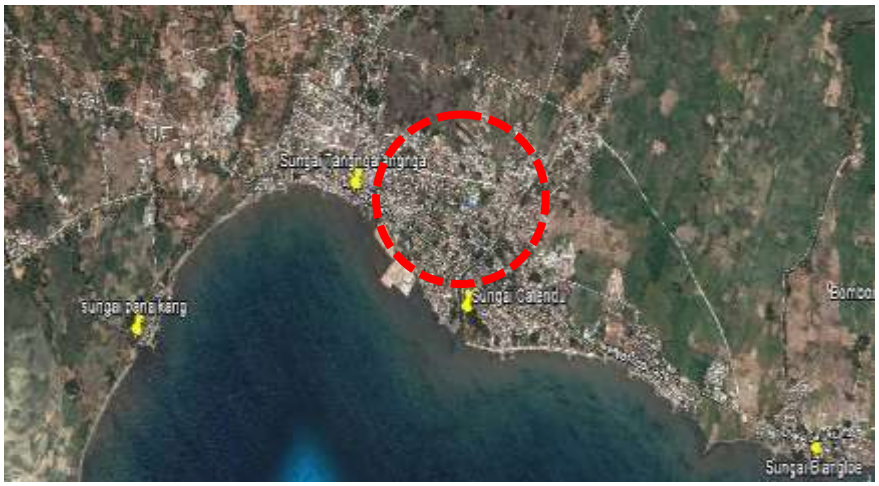


Figure 2. Research Framework

III. METHODOLOGY

The location of this research is in the coastal area of Bantaeng Regency.The actual place is in the Calendu River neighbourhood (Figure 3). The data are obtained from direct observation and interview to the fishermen particularly. The method of analysis uses descriptive qualitative, comparative study with the proper standard and spatial analysis, in addition to planning approach in integrated industrial location concept.



Transportation Infrastructure Integration

Nowadays, the binding process of seaweed processing activities occurs in dry-land, whether the planting takes place in wetland (sea). There are loaded-unload process in mooring along the shorelines. Besides, the drying process takes place in two places, which are on land and on shorelines above the water.

The seaweed processing activities occurrs on high density housing neighbourhood in the coastal areas. Some fishermen make the binding process in their neighbour yard or on the road side far from their houses. The reason for this situation is the most of the fishermen live in high density locations with small or no open space/courtyard. A narrow lane makes the modern cart such as forklift impossible to go through. However, a strong social bonding appears in the processing activities. The open space around the house can be used toghether for binding and drying activities. Family members and neighbours sit together for binding or drying activities.

There are two types of housing in the seaweed processing. Firstly, housings are located near the drying areas on the road side but they are far from the sea as the plantation zone. Secondly, the housing is located far from the drying and planting area but close to the planting area. As a benefit, fishermen do not have to cross the main road after unloading processes. Both types of housings are located in a low quality environment. Poor sanitation system and waste are the main issues in the housing infrastructure problems.

The most of the cases in Bantaeng Regency, the location of housing, drying and planting areas, as well as warehouse are placed separately (Figure 4). This situation is caused by the limitation of land in the housing neighbourhood. Meanwhile, the industrial activities occur under the elevated houses. Hence, there is a distance in processing activities and the distance causes some inefficiencies in the distribution process. Adding to this, fishermen have to move to some different places in binding, drying and planting seaweed with traditional equipment or manual ways. As a result the mobility impacts slow progress and less productivity.

Figure 4. Map of Separated Processing Area

Connecting the housing and the facilities as well as the industrial areas in the seaweed processing community, not only can help the fishermen improve their product quality but also can increase their income. Therefore, an integrated land-use planning and transportation infrastructure are essential for Bantaeng seaweed communities.

A Transportation Connectivity System Which Supports Housing Activities Based on Seaweed Processing and Industry

The distribution process is important in the seaweed processing phases. Moving the seed or harvest by crossing the main road is one of the problems that needs a solution. Besides, carrying the seaweed with the traditional ways and while crossing the road is dangerous activities for the fishermen.

In every phase of the seaweed processing, fishermen have to deal with the heavy weight of the products. They have to move 3-5 tons of products near houses for binding phases or near the sea for drying phases. This is the reason for most of the drying container lying along the shorelines. Fishermen have to put their tools as close as possible to the sea in an effective effort to move the harvests from ships to drying containers. There are no yet appropriate connectivities among sea transportation, street networking and carrying tools. The variety of transporting can be seen in the next scheme.

Type 1: Sea → Mooring →Drying Containers
Type 2: Sea→ Mooring → Road Crossing → Drying Containers

The idea of developing the industrial activities in the future has to make the fishermen alter to modern ones in carrying their products. As a consequence, this needs to be supported by proper transportation infrastructure. Recently, poor connectivity between places in the seaweed processing give no choice for fishermen to improve their tools.

The transportation infrastructure has to support the seaweed distribution processes and people mobility in the neighbourhood. Linkage around the housing, facilities, the industrial zones and planting areas are the most important factors to maintain the processing activities. Another thing to be thought is the use of advance technology in moving goods. The street planning should allow modern cart (forklift) possible to go through. Consequently, the concept of transportation infrastructure has to adjust to these needs.

The Transportation and Housing Infrastructure Concept Based on the Seaweed Processing and Industry

The seaweed processing activities in Banteng Regency grow strong in the communities with tight social bonding. The relationship among the fishermen is closely tied in the higher density housing neighbourhood. The small industries remain exist in the traditional way of the fisherman communities. Improving the physical facilities can help the local industries move to the higher level. However, the improvement should maintain the social bonding in the communities.

The development of the seaweed industrial areas should be integrated to the fishermen housings infrastructure, industrial zones and also supported by the good accessibilities in the transportation system. The industry will improve and also maintain the relationship among the fishermen.

This research takes place around riverbanks, estuaries and shorelines. An integrated seaweed processing industries can be applied in vacant land near the seaweed communities' neighbourhood. New approach in developing seaweed processing industries should integrate the logistic mobilities from the sea areas to housing and processing areas.

The conceptual elements are developed according to Wunas (2014) about location principles and Ginkel (2007) about the fishermen social relationship. This research proposes two concepts in transportation and housing Infrastructure based on Seaweed Processing and Industry which are descibed in Figure 5. The concept scan be applied around the river banks, should adapt the local community activities and suggest the sub-district and district scale alternatives.

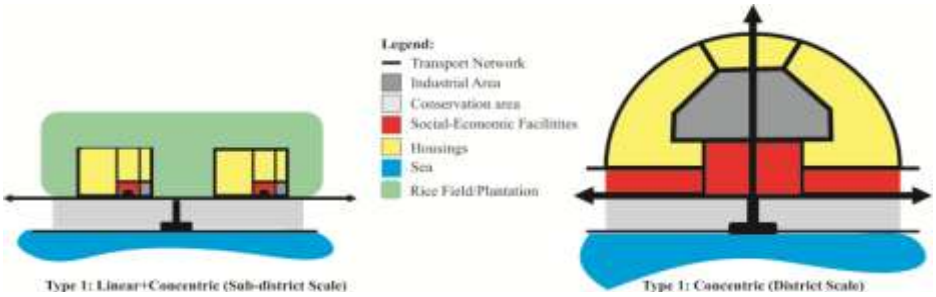


Figure 5. Proposed Concept for Integrated the Seaweed Industrial Development

V. CONCLUSION

1) There is no integration among housings, facilities and industrial areas. All of them are placed separatedly; 2) Transportation connectivity can only serve a traditional mobility of seaweed production types. 3) The concept of an integrated transportation and housing Infrastructure based on Seaweed Processing and Industry suggested in two types: First, the linear and concentric shape in sub-district scale. Second, concentric shapes in district scale.

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