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In The Sustainable Development *on Delta Areas*



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PROCEEDINGS - International Conference
ISSUES, MANAGEMENT AND ENGINEERING IN THE SUSTAINABLE DEVELOPMENT
ON DELTA AREAS

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PREFACE

The coastal area or delta area is an area with huge potential to be developed. Development of delta areas as a city has a very strategic value because the city can be developed as a port city, recreation and conservation. However, in its development, many problems arise in urban development efforts in this coastal region. These problems include the pollution, over-exploitation of natural resources, abrasion, habitat degradation, conversion of the designation of protected areas into other development, and natural disasters. One of the most dominant constraints encountered in the development of delta areas is a flood.

Flooding problems in the delta area, not a simple matter. Many factors influence and required careful consideration in the planning, among others, an increase in discharge, narrowing and silting of channels, reclamation, land subsidence, liquid and solid waste (garbage), and the tide. Land Subsidence that occurs in many coastal cities resulting floodwaters. Land subsidence is caused mainly by excessive groundwater abstraction, which resulted in some parts of the city are the same height and even below sea level pairs. As a result of gravity drainage system will be disrupted, even cannot work without the help of a pump. Even in some places can cause permanent inundation of the tide that is commonly known as tidal flooding.

The problems in coastal areas need to be resolved. This is due to the dependence of communities on coastal and marine resources. Where the function of coastal and marine areas is a port (transport), recreational and conservation areas.

With regard to the existence of these problems, the Universities play an important role in contributing ideas to give feedback suggestions and solutions. Therefore, Faculty of Engineering, Universitas Islam Sultan Agung (UNISSULA), held the International Conference with the theme "Issues, Management and Design in the Sustainable Development on Delta Areas".

Participants of the conference included researchers, academic staffs, students, industries, governments. The keynote speakers and invited speakers during the conference are as follows :

Keynote speakers :

- **Dr. Ir. Arie Setiadi Moerwanto M.Sc.**
Director of Empowerment of Water Resources, Minister of Public Works and Public Housing, Indonesia
- **Bert Hooijer**
Director of RDM Centre of Expertise, Rotterdam University of Applied Sciences, Netherlands

Invited speakers :

- **Rick Heikoop., MA., MEMR**

Senior Lecturer/Researcher Water Management, Rotterdam University of Applied Sciences, Netherlands

- **Ir. Steven Starman**

Manager International Project, Van Hall Larenstein University of Applied Sciences, Netherlands

- **Arthur Hogduin., M.Sc**

Director Education Delta Academy, HZ University of Applied Sciences, Netherlands

- **Frits Blessing**

Program Manager Living Lab Logistic Indonesia-Netherlands (LLLI – NL)

- **Ferdian Suprata**

Program Coordinator Living Lab Indonesia, Nufic Nesso Indonesia

Proceedings **INTERNATIONAL CONFERENCE ON ISSUES, MANAGEMENT AND ENGINEERING IN THE SUSTAINABLE DEVELOPMENT ON DELTA AREAS** is a collection of papers are arranged to follow this International Conference. The papers are subdivided into 3 (three) major sections, as following :

- A. Sustainability Of Water Management; Environmental Impact In The Delta Areas
- B. Urban & Regional Sustainable Planning; Problem Solving For Soil Construction In Delta Areas
- C. Structures & Materials Engineering; Construction Management Role In Delta Areas

There are 26 paper contributors in this proceedings. The proceedings are expected to be able to contribute of problems solving in sustainable development on delta areas

Finally, the organizing committee wishes that this conference is able to provide beneficial scientific information to the participants and other concerned readers.

Semarang, 20th February 2015

Organizing Committee.

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Charateristics of Settlement at Balikpapan Coastal Road Area (Case Study: Damai Regency)

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Abstract

Residential character influenced by its location. The settlements are located on the beach would have been different with the existing settlements in the mountain valley, at the foot of the mountain or settlements in cities including settlements on the edge of the river. In addition to the formation of the land, the character of settlements is also influenced by the character of its inhabitants are much too influenced by the type of their livelihood.

This paper describes the pattern of space that has occurred in the seaside settlement coastal road in District of Balikpapan City and district of South Balikpapan. The collecting data using descriptive qualitative method approach. This approach is at least able to describe the condition of settlement patterns that have occurred in the seaside coastal road including occupancy character from the standpoint of livelihood of the population.

Based on studies it is known that there are settlements along the shore coastal road that people whose live very heterogeneous, so the model that arrangement adapted to the understanding and ability of the community. Some proposals are doing structuring infrastructure existing environment, then in some areas is illegal land will be cultivated with the fulfillment of the towers (Rumah Susun) for low income. The characteristic of the settlement Damai Regency is likely most of many settlement in coastal area, that have a poor access for sanitation, the houses most build by wood and some of them rarely inundated by tidal flood.

Keywords: pattern, settlement and coastal area

1. Introduction

Manning and Sweet (1993) note that behind the role of coastal regions as a space there are socio-economic and socio-cultural, the development potential of coastal area often overlaps. Social and cultural life of the coastal population with a variety of activities, on the one hand, land use and infrastructure settlement of physical activity, is rarely a problem in the management of coastal area.

Coastal area as a resources for the needs of this population is always in conflict, when one of the more dominant land fulfillment of the needs of other land (Mather, 1986). Land **requirement is closely related** to the local area environment, both are

interdependent, and mutually influential. The linkage between the needs and land use with aspects of coastal areas (Ritohardoyo, 1991) appears in its application for land conservation, and basic development of the region. Meeting the needs of land that do not

heed the norm preservation, may result in damage to coastal ecosystems, which is very detrimental to the life of the population. Therefore, the development of coastal areas is a strategic business that is very necessary. Development of coastal areas as residential population is closely related to solving the problems of slums present and future. Over time, the demands of settlement in the city's development should be thought together. Demands of space that is not based on the ability of society and the economy of the carrying capacity of the environment to make the city experienced a decline in value.

Spatial increasingly irregular as a result of lack of knowledge about the quality of the environment created by the people especially the lower middle class, with a carrying capacity of the economy is still quite low. The low carrying capacity of society in addressing the demands of urban space, resulting in the emergence of pockets of slums with some characters, such as the seaside slum that is a form of settlement inhabited waterfront community with physical and environmental conditions are bad. These conditions must be very unfortunate for the development of a city.

The rapid growth and development of the coastal town will impact on the surrounding area including the coastal road Balikpapan City area as an extension of the city to be developed. This of course will lead to a variety of complex problems requiring the handling of the existing area.

2. Aims of Research

- a) To identified the socioeconomic and cultural conditions of the community settlements on coastal road Balikpapan City (Damai Bahagia Regency and Damai Regency)
- b) To identified the physical character of settlements coastal road Balikpapan City
- c) To identified settlement patterns of coastal road in Balikpapan City

3. Research Methods

This type of research is very important. In the context of this study, consideration is to be able to capture the socioeconomic and cultural condition, physical character and the pattern of the settlement of the community in coastal road of Balikpapan city. Therefore the aspect of "depth" is an important consideration in selecting and implementing research strategies. This question refers to the right kind of research is qualitative research.

Moleong cites the opinion of some authors (Willens and Rausch, 1969; Bogdan and Taylor, 1975; Denzin and Lincoln, 1987), Natsir (1988), and Yin (2005) that qualitative research is a research that aims to understand the phenomenon of what is experienced by the subject (behavior, perception, motivation, action, etc.) in a holistic manner, and by way of description in the form of words and language, in a specific context natural and by using various natural methods. This kind of coloring all stages of research studies conducted, including the selection of strategies or methods of research and analysis. In this context, the method or strategy is suitable qualitative research.

4. Literature Review

4.1. Pattern of Settlements

According to Hadi Sabari Yunus (2005: 93) says that most of the urban settlements, especially in Indonesia, especially those close to the city center has reached saturation point building settlements, so that no remaining vacant land that can be used as a home construction site. This condition is called (death point). No exaggeration to say that the cities in Indonesia, most settlements are situated in the center of town is a slum. Settlement type is characterized by a relatively small building, huddle-attached,

residential facilities is very less, the quality of low buildings and many other issues that are inside.

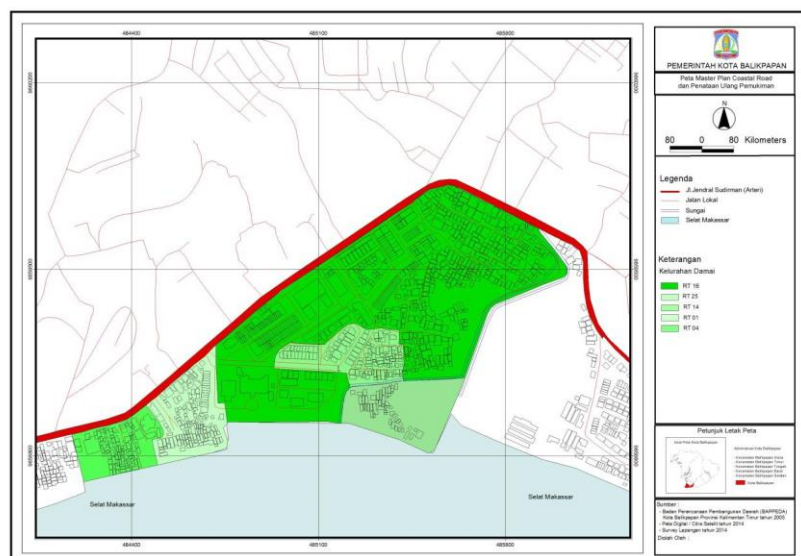
According to Burgess in Sabari Hadi Yunus (2004: 5) argues centered or concentric theory which states that urban areas can be divided into six zones, among others: 1) Central Business District, which is a large shopping center, highrisk buildings, banks, museums, hotels, restaurants, and so on; 2) The transition zone, an area of activity. This zone is not stable population, in terms of social and economic residence. This area is often encountered slum area known as zone populated slum poor. However, this zone is actually an industrial development zone at the same time connects the city center with its outer regions ; 3) settlement zone proletariat class, housing are better than the slum area because it is inhabited by low income workers or workers and employees of the lower class, characterized by the presence of small houses that are less attractive and simple flats inhabited by a large family. Burgess named this area Workingmen's homes; 4) middle-class residential zone (residential zone), a residential complex middle-class employees who have particular expertise. Houses better than the proletariat; 5) The area which houses the high income. Characterized by the elite area, housing and large yard. Most of the population is the executive, large employers, and high-ranking officials; 6) Zone commuters (commuters), is an area that enters the rear area (hinterland) or a rural-urban boundaries. The population works in the city and live in the suburbs.

4.2. Review of Balikpapan Regional Planning

Appropriation Housing Area Development Plan include: a) Develop a vertical housing in high-density residential areas; b) Improving the quality of a residential neighborhood in the District of western Balikpapan, Balikpapan District of Central, Northern District of Balikpapan, District of South Aberdeen, District and Sub-District Balikpapan Balikpapan City East; c) Urban Renewal fishermen settlements in most Baru Tengah Regency, Baru Ulu Regency, Kariangau Regency and Manggar Regency; d) Develop road edge in the fishing settlement in most Baru Tengah Regency of Baru Ulu Regency Balikpapan West District, partly Klandasan Ilir Regency Klandasan Ulu and Regency District of Balikpapan City, partially Manggar Regency, District of East Balikpapan.

5. Findings

Damai regency is located in the southern of parts Balikpapan city as seen below.



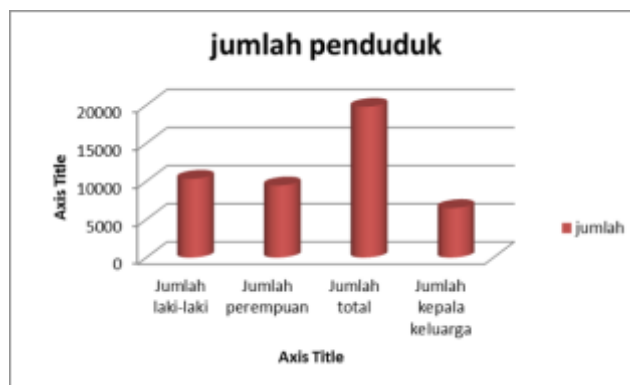
There are many activities in Damai settlement that based on purposed, function and community involvement as

Table 1. Damai Regency Area for multiple uses



Source: Village Profile, 2013

In the table and charts above can be seen of the land use existing in Damai Regency which is to settlement with 208 ha, while the rest used for a garden 2,5 ha of land and for the burial of 2,3 ha.



A. Population

Most Damai dwellers are working as fishermen. Therefore, there are several community activities which are conducted in the main road and areas adjacent directly to the sea. The activities are parking and boat landing, fish marketing, and boat repairation. Those activities were done in wharves, TPI (fish auction center), and docks.

B. Nature

Tidal flood is a typical disaster, it seems identical to the location of Damai. It can happen in a sudden. Besides, the location of Damai which is directly adjacent to the sea makes it highly vulnerable to the natural disaster such as big wave or tsunami. Therefore, buffer zones are needed to give enough time for the community to prepare and reduce the damage to the housing. This area also functions as mitigation area. The first area is buffer area which is located adjacent to the sea.

Other facilities such as wharves, docks, place for fish drying, and place to repair boat, should be located in buffer area. To do their daily activities, it is not necessary for the dwellers to enter the river areas, they can do it in the coastline.

C. Houses

Generally the houses in Damai are permanent and also semi-permanent houses and temporary houses made of wood. Most of the houses are located on the ground rather than on waters. Damai's settlements have to challenge to the tidal flood and land subsidence.

Therefore, the dwellers must elevate their floor regularly. It needs high cost indeed. For this reason, there are many sink houses because of the occupants' incapability to adjust the condition of their house against the land subsidence and tidal flood.

The settlement conditions contained in the Damai regency, most of the houses on stilts, this is because, the location of the settlements already jutting into the sea, so that at high tide, the houses will be submerged in water. To anticipate that the population (most of whom are descendants of Bugis) use the home stage as shown below



D. Infrastructure

The community in Damai thinks that the infrastructure is not sufficient, such as:

a. Road

Road condition is poor since it is too narrow that makes it inaccessible for fire fighting car. Besides, it is also often inundated by tidal flood.

b. Wastewater drainage

There are many drainages which are not well functioned since it is clogged up by mud and garbage.

c. Waste management

Waste management is poor since there is garbage littered in public area. It is worsened by the community less awareness to have healthy life style. For other infrastructure such as electricity, freshwater, and telephone network get positive

d. Fresh Water

To fulfillment of fresh water most of family is r relying on PDAM and wells. In Damai regency there 22 units pump well and 37 unit deep well.



For other infrastructure such as electricity, and telephone network get positive response from the community since it has been sufficient.

Based on the field finding, related to coastal settlement spatial planning, a good infrastructure planning is essentially needed. The main access must have a good quality and sufficient width to connect the fisherman settlement with the main road networks. It, then, will accommodate the community productivity. Neighbourhood infrastructure such as waste disposal and firefighter networks on the area must be spread evenly in the settlement area. The location can be integrated with the public and social facilities.

E. Facilities

Related to the fisherman settlement, the facilities can be classified into:

- Main Facilities of Fisherman Settlement are the focus/center of a fisherman settlement. The facilities function as a connector between the activity of fishing and its catchment and its distribution. The distribution is performed in ground, in a form of: TPI, local market, wharf. It is important to get sufficient main access. Moreover, it has to be accessible so that the community, both fisherman and non fisherman, can make use of it.

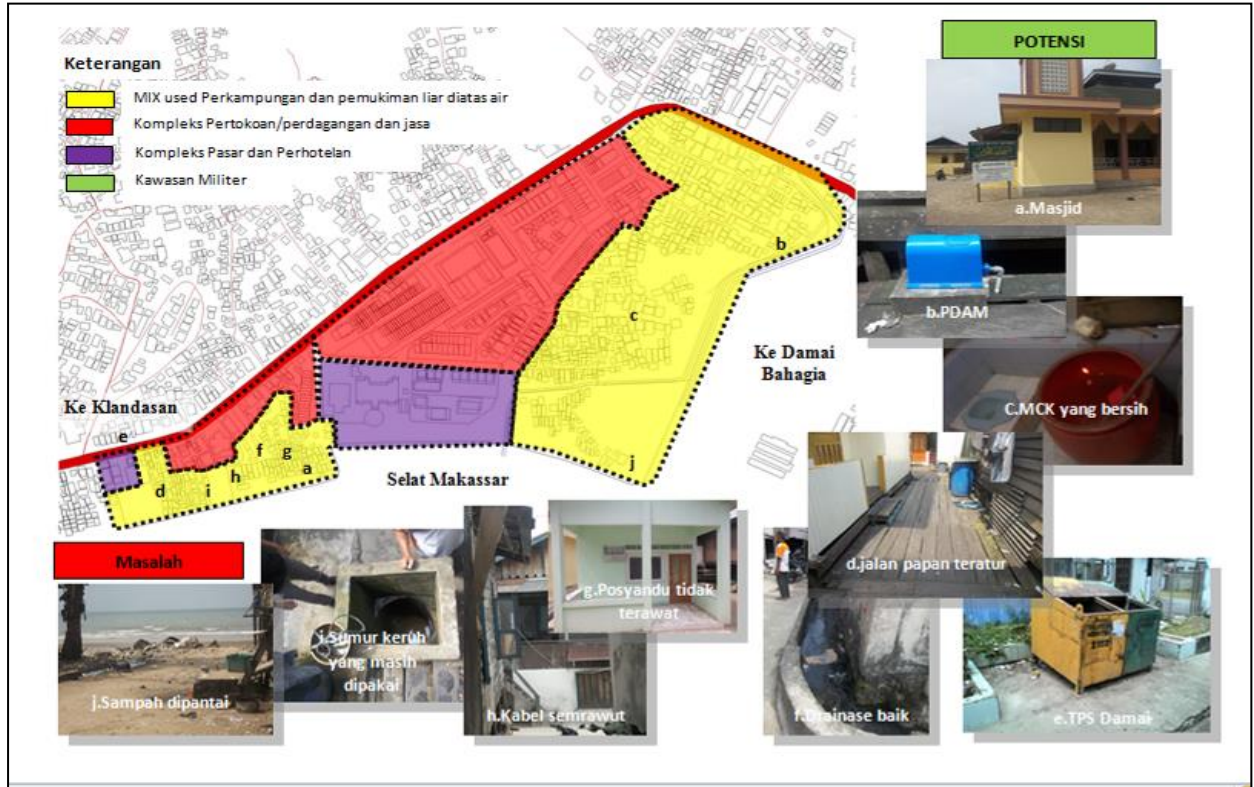
- Land Fisherman Facilities are supporting facilities for the fishermen that are located on the ground such as boat repair facilities, fishing equipment repair, and fish drying.

- Primary facilities, which function is to connect the activities of fisherman and nonfisherman community. These facilities should be located along the main road which have direct accessibility to the main facilities such as education, health, and worship facilities.

- Secondary facilities, which function is to connect the activities of fisherman and nonfisherman community in a smaller scale. These facilities need to be spread evenly in the settlement area. These facilities can be in a form of group of social and public facilities such as Open Space which functions as recreational and sport site as well as drying fish and repair fishing equipment, security post, mosque and disaster mitigation facilities

From the picture above can be seen in the Damai Regency settlement conditions; The settlement above the water growing and overhanging towards the sea so that accessibility is low. Density of the House led to the area being prone to catastrophic fires. Homes tend to be semi-permanent (home staging-wood). For the infrastructures of the trash; Garbage dumped into the ocean. While the Sanitation Network directly to the sea. The environment liaison activities the community in the form of bullying that wood is not feasible and vulnerable fire hazard. The narrowness of the home space living

in settlements over water makes the community take advantage of open space as a parking area.



6. Conclusion

The structure of conceptual spatial model is divided into two dominant clusters of population, that are 1) fisherman cluster and 2) non-fisherman cluster, which domination is increasing. Despite of the obvious classification, in fact, the activities of both clusters are interlinked. The components of the spatial model are:

1. Fisherman facility share side of which environment center is open space which is used for net reparation, machine reparation, and fish drying process.
2. Secondary facilities of which environment center is open space which is used as children playground.
3. Common facility area, which are educational and religious facilities.
4. Main facility center, that are fish auction center, market and wharf, as well as solar station.
5. Fisherman facility sea side, include buffer zones, that are mangrove forest.
6. Main access to reach fisherman core facilities, which also serves as main road in the settlement area to connect fisherman and nonfisherman core facilities

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