



UNTAR
FACULTY OF
ENGINEERING



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PROCEEDINGS

2nd International Conference on Engineering of Tarumanagara

“Urban Engineering for Future Generation”

Jakarta, 22-23 October 2015

Auditorium M Building, Campus I,
Tarumanagara University
Jl. Letjen. S. Parman No. 1,
Jakarta 11440 - Indonesia



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(ICET)**

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**FACULTY OF ENGINEERING
TARUMANAGARA UNIVERSITY
JAKARTA-INDONESIA
2015**

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PARALLEL SESSION SCHEDULE
 22 October 2015

ROOM : 1

MODERATOR : Klara Puspa Indrawati, S.T., M.Ars.

SESSION : 1

No.	Time	Paper ID	Title/Author/Authors
1	13.00-13.15	AE-02	Performance Analysis in Home Industry Scale Production of Modified Traditional Brick as Green Building Material With Reed as Filler <i>Kurniati Ornam, Masykur Kimsan, La Ode Ngkoimani</i>
2	13.15-13.30	AE-10	Study of Staircases Design and Visitors' Perception at Commercial Building <i>Siti Belinda Amri, Santi, La Ode Abdul Syukur, Aspin</i>
3	13.30-13.45	AE-11	GreenShip Rating of Wood Materials in Building <i>James Rilatupa</i>
4	13.45-14.00	AE-12	Study of Bioclimatic Application to the Spatial Habitation Along the River Bank Ciliwung <i>Handajani Asriningpuri, Ratih Budiarti, Harlisa</i>
5	14.00-14.15	AE-14	Bornean Long House: Cosmological Value in Socio-Cultural Transformation Stream <i>Klara Puspa Indrawati</i>
6	14.15-14.30	AE-15	Potential Tour Toward Village of Cultural Conservation of Baluwerti, Surakarta, Jawa Tengah, Indonesia <i>Naniek Widayati Priyomarsono</i>
7	14.30-14.45	UE-03	Urban Sprawl Effect to Sustainable City <i>Andas Budy</i>
8	14.45-15.00	UE-04	Arrangement Model on the Sustainable Coastal Settlement in Makassar <i>Naidah Naing, Asdar Djamereng, Bulgis</i>

ARRANGEMENT MODEL ON THE SUSTAINABLE COASTAL SETTLEMENT IN MAKASSAR

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Abstract

Indonesia is an archipelago with a number of islands reaching 17,508 and the length of its coastline approximately 81,000 Km (DKP, 2008). These characteristics cause coastal areas becoming the mainstay source of public revenue for Indonesian. Generally, coastal areas can be defined as meeting areas among the local terrestrial ecosystems, marine ecosystems and ecosystems connecting in delicate balance (Beatly et al, 2002). The aim of this study was to develop an arrangement model of environment on the sustainable coastal settlements, so that planning concept can be run more effectively, as well as life can continue in harmony. Qualitative research method and Spradley model analysis were used to identify settlement arrangement model and to be developed that maximizing relevant model to the local environmental conditions of coastal areas. Temporarily, the results showed that arrangement models of environmental settlement tend to cluster and spread irregularly with settings orientation based on mere needs without regarding to healthy conditions of environment and passage ships/boats.

Keywords: models, environmental arrangement, coastal settlements, sustainable

INTRODUCTION

Located on the seaside tend to change quite rapidly, causing a variety of problems such as the increasing need for land housing, industry, trade and services, ports, warehousing, marine tourism, and infrastructure, so it is necessary to expand through reclamation. Makassar includes as one of coastal cities located in Indonesia. Makassar has beaches elongating on the western and northern parts of the city which the majority is used for housing.

A coastal city that most of its parts are flat. Makassar height ranges from 1-25 meters from sea level and with slope averages 0-5° toward the West. Based on the geological map, Makassar and its surrounding covered with tertiary and quarter rocks such as volcanic rocks and alluvial deposits.

According to Kay and Alder coastal areas are unique, because in the context of the landscape, the coastal areas are meeting places of land and sea. Furthermore, the coastal region is an important area in terms of various viewpoints of planning and management. Department of Maritime and Fisheries in its law draft of management of the Integrated Coastal areas defines coastal areas as transition areas connecting the terrestrial ecosystem and marine ecosystems located between the boundary demarcation towards the ground as far as the highest tide and towards the sea as far as the effect of the activities of the mainland. Coastal area has a high economic value, but its sustainability is threatened. With the unique potential and economic value, then it is faced with the high threat, therefore it should be handled in special manner, so that these areas can be managed sustainably.

Coastal city on the seaside is as one of the waterfront cities basically rooted in geography and history factors that for centuries has been a part of the international trade lanes. In the further development this area becomes an attractive place for settlement. These symptoms can occur for many reasons, among others:

- an alternative area of urban settlements for the poor urbanists.
- an opportunity for ease of transportation.

- a natural gateway for trade between places separated by the sea.

The condition causes the high rate of urban growth, where the coastal urban areas tend to grow faster, both demographically and economically than cities in other regions. But due to the rapid development of road transport and activity centers outside the edge of the water area, the waterfront area of the city begins to lose its leads. Most of the region of space utilization is only used for port activities, warehousing and fisheries. With the variety of different interests, the development of the waterfront city can lead to conflict among others:

- interest between government institutions and port management; both national and regional
- between commercial and social interests;
- between the public interest and the individual interest.

MATERIALS AND METHODS

The research method applied was a qualitative method since the study was conducted on the natural condition or natural object. Natural object is an object that is growing as it is, is not manipulated by the researcher or the researcher's presence does not affect the dynamics of the object. Qualitative research in addition to searching for the truth, is also trying to figure out how the respondents perceive the world around them in terms of perspective (emic perspective), according to the thoughts and feelings (Sugiyono, 2007). Qualitative research purpose is not to test the hypothesis which is based on a particular theory, but rather to find patterns that might be developed into a theory. This theory gradually transforms into a particular form based on the analysis of data growing throughout the course of the study.

The reason for using qualitative method, because qualitative research discerns to the object as a whole (holistic). Every aspect of an object that has a unity that can not be separated, it is dynamic, full of meaning and relationships and interactive symptoms (reciprocal). In qualitative research, the meaning is something that can only be obtained if it is connected with the information and context. Information (eg. what happens) and context (things relating to surroundings). The information which is omitted from its context will lose its meaning.

Therefore, in a qualitative study, researcher intended to understand the social situation deeply, find the process, patterns and theories. Research with qualitative methods used to obtain in-depth data, a data implies meaning. The meaning is the actual data, the actual data is value behind the apparent data. Therefore, qualitative research emphasizes more on the meaning. So in this study used a qualitative research method.

Research Sites

The research was taken place on the area of Coastal Categorized slums. The study involved three (3) areas. They were sub-Cambaya district-Ujung Tanah, sub-Tallo district-Tallo and sub-Biringkanaya district-Untia.

RESULTS AND DISCUSSION

A. Region Position of City Beach

The end result of research in the district Land, Tallo and Biringkanaya and secondary data study of some similar locations/regions showed that:

- a. Boundary of coastal areas do not only cover part of the city on the ground and face the sea, but also include a part that is above the water. Even previous developments were initiated by the presence of some settlements on the water area.

- b Orientation activities on coastal area of land and sea -based, such as trade, ports and transport, fisheries and settlements.

B. Overview Specific Coasta Area of Makassar

1. Patterns of settlement distribution

a. Sub-Cambaya district-Ujung Tanah

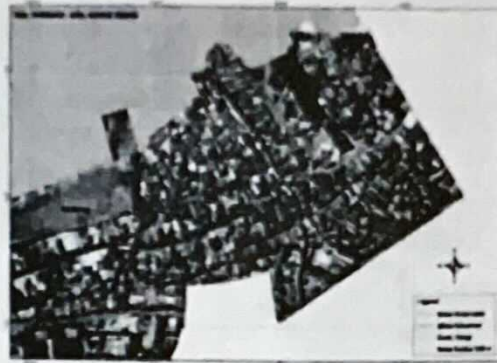


Figure 2. Air Map Sub-Cambaya
Source: Tele Atlas (Google Earth) 2012

The first location of this study is one of the coastal areas in Makassar, located in district-Ujung Tanah in sub-Cambaya. sub-Cambaya directly adjacents to the boundaries of the region:

- North: Makassar Strait district-Ujung Tanah
- South: Sub-Camba Berua District-Ujung Tanah
- West: Sub-Gusung district-Ujung Tanah
- East: Sub-Buluo District-Tallo

Geographically, location has at $5^{\circ} 06' 39.13''$ S - $119^{\circ} 25' 35.82''$ Cambaya E. In Sub-Cambaya, there are 5 RW and 22 RT.

Cambaya population has 6,079 inhabitants, which consists of 3581 men and 2498 women. Of the 6,079 inhabitants of population consist of 1,255 households. with its population density is $12\ 015/\text{km}^2$. The total area of settlements is $0.53\ \text{km}^2$ and altitude of settlements is $< 500\ \text{m}$, and the distance from office-sub to office district is $300\ \text{m}^2$, and a total building area of $0.30\ \text{ha}$ school/ m^2 . While the height of the area from the sea level is 2 meters.

Based on the above data pattern of people settlements in Cambaya generally linear, irregularly with high building density. Uncontrolled population growth in Cambaya causes dense district and slums. The highest population density in cambaya is located in RW 1 reaching 65% and RW RW 3 and 4 also have a very high density that is 80%, which resulting in a lack of green open space on the those 3 RW dan also causing the circulation of the road very narrow. Almost all parts of the districts have been built with the houses , so that only $\pm 10\%$ of the surface of the land is open space.

Patterns are applied in a row house in settlements in Cambaya only divided by the environment with the road width ± 1.2 to 2 meters. and the population density causing the environment is not maintained, causing a decrease in the quality of settlements. There are about 70% of 100% of the population in Cambaya admitting to the local area is very dense about 97% of 100% of the population has an extensive yard/vacant land $< 10\ \text{m}^2$.

b. Sub-Untia Districts-Biringkanaya

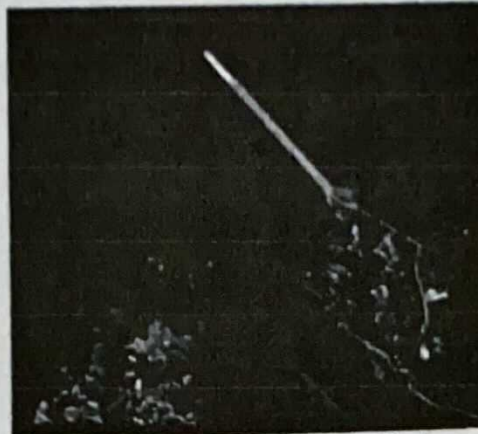


Figure 3. Air Map of Sub-Untia
Source: Tele Atlas (Google Earth) 2012

Sub-Untia is one of the subs located in district Biringkanaya. The total area is 2.89 km² and consists of 5 RW. This area is included in the area of the development of residence, industry and tourism. It encompasses Sallodong and Ir. Sutami streets. In Untia, there area also some places only as a path and a small hallway. To get there, the north borders on Maros region.

The total population in Untia is 2,060 consisting 1,073 men and 987 women with a number of households is 421 people. RW 2 is known as highly inhabited. There are 576 people. While RW 4 is the fewest inhabited by men. There are 432 people in RW 1 and it is considered as the most highly occupied by women. And the fewest number of women can be found in RW 3.

From the observation of the location of the settlement pattern in Untia generally uses Linear following the pattern of road network. It is regularly managed with its medium building density. Land use is dominated by the settlement of fishermen and the remaining is open space. House pattern is similar to the previous one that is progression system divided by the environmental road with its width $\pm 1,5 - 2,5$ meters.

Under these conditions, strong winds can be anticipated very well. Placement of vegetation can also reduce the strong winds that often occur in Sub-Untia. The house located on the edge of the sea line very densely, it is influenced by the laying of vegetation. If we notice such distance, people in Untia keep retaining the coastal border of ± 20 meters.

c. Sub-Tallo District-Tallo

The second location of study is one of the coastal areas in the ci Makassar. Administratively, Tallo is located in District Tallo, Regional Level II Makasar.

The geographical position of its office is located at S 05 00'26,7 " and E 119 02'22,9 " , with boundaries:

- North: Makassar Strait
- South: Tallo River District. Tamalanrea
- West: Makassar Strait
- East: Sub-Buloa District-Tallo

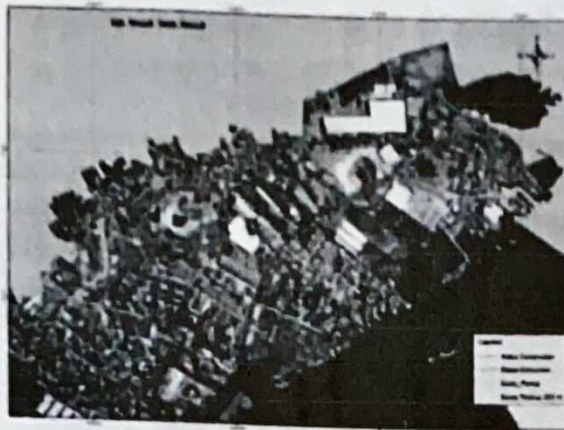


Figure 4. Air Map of Sub-Tallo
Source: Tele Atlas (Google Earth) 2012

Tallo is inhabited by 8017 people, made up of 3,898 men and 4,119 women. Number of pre-prosperous family in Tallo is 1,043 families.

Based on field observations the pattern of settlements in the Tallo generally linear and Spread following the road network. It is irregularly managed with medium building density. Land use is dominated by residence, the oil processing industry and the remaining is private open space.

House pattern is similar to the previous one that is the progression system divided by the environment with the road with its width ± 1.2 to 2.5 meters. Under these conditions a strong wind disaster can still be a threat. However, if there is a fire can still be solved quickly. The houses located on the edge of the sea line ver densely, If it is noticed between the distance of the beach and the settlement do not sustain coastal border. Even still there are houses that settled over the water.

C. Sustainable Management Strategy

Integrated coastal zone management requires the existence of a common vision among stakeholders. Realizing the importance of the management vision, it is necessary to spearhead the formulation of mutual vision as the realization of the management of coastal resources that is environmentally and sustainably sounded, supported by improving the quality of human resources, regulation and law enforcement, as well as the arrangement space for the realization of people's welfare. Referring to this vision, the strategy of sustainable integrated coastal zone management must consider the aspect of human resources, legality, space, and the common welfare.

Coastal zone management strategy will be focused on addressing the main issue that is the conflict utilization of coastal area, which simultaneously also associated with the handling of other issues. The basic idea in the formulation of management strategies includes sustainability, protection and preservation, development, equity, and communication. From this idea, it is formulated that management strategies accommodate the values, issues, and management vision.

Coastal management strategy focused on utilization are as follows:

1. Identifying the space users and needs.
2. Preparation of coastal spatial planning to address the cconflict issue.
3. Determination of coastal border and mangrove planting.
4. Control of reclamation.
5. Tightening the standard of waste quality and waste management.
6. Slums arrangement.

7. Improving drainage system.
8. Consistency of law enforcement

D. The concept of structure of sustainable coastal settlements in Makassar

Some examples of the concept of the design elements that can be applied to the coastal region of Makassar through structuring a sustainable built environment, by controlling the micro climatic factors (sunshine, wind, humidity, rain, vegetation, and water), among others, by:

1. Creating linkages between water management, green layout, tat open space, and land use planning in urban scale in an integrated Citywide Linkage.
2. Creating shade elements in condition veranda is in the scale of the building in the form of an atrium, hallways, balconies, plaza, park roof (roof garden) or Clio, the completion of wall that extends vertically as well as the temperature of the cooling water system for vertically or Horizontally built (fountains, ponds, waterspray).
3. Creating shade elements in the scale of the region through the design of pedestrian pathways ornamented with shade elements such as pergolas, aquatic landscape design and vegetation in open spaces, the design of the road surface material that can absorb water.
4. Designing buildings that can optimize the use of natural air system and avoid radiation heat stored in the walls of the building.
5. Controlling air flow system from-to urban areas through the arrangement of corridors and pockets of open space for air circulation to avoid occuring of heat island in the source of temperature rise.
6. Creating open network spaces and vegetation in certain scale of urban city.

E. Guideline of arrangement model of Sustainable Coastal settlements in Makassar

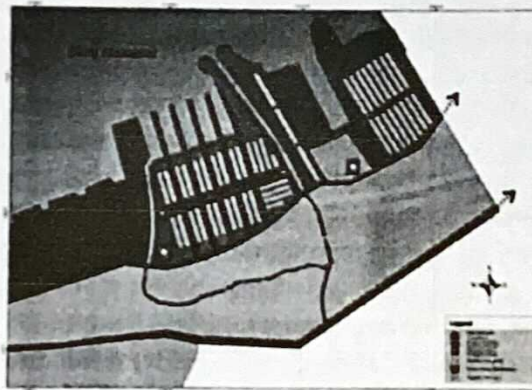


Figure 5. Guideline Cambaya Zone Village Area, District Ujung Tanah
Source: Design Analysis

In cambaya, it uses grid pattern, previously the pattern used was not clear, untidy and grubby due to the very high level of house density that it required a fairly complex concept approach. considering these conditions, offered a new residential concept called 'Rusunami'. Concerning that the area is prone to get fire and flood tide. Besides that they earn living as fishermen and fishmonger, so building some piers is necessarily conducted in this area.



Figure 6. Guideline Zone of Sub-Tallo, District-Tallo
Source: Design Analysis

In Tallo, it uses Combination patterns of Radial and Grid, in which previously, the pattern applied was not clear, irregular but house density is still in the moderate category, so it is still possible to develop with environmentally friendly concept. Mangrove and Nipah ecosystems in Tallo used to grow very much, but now, it is almost exhausted. Therefore special reforestation is necessarily done for the continual and existing fish life in seashores.

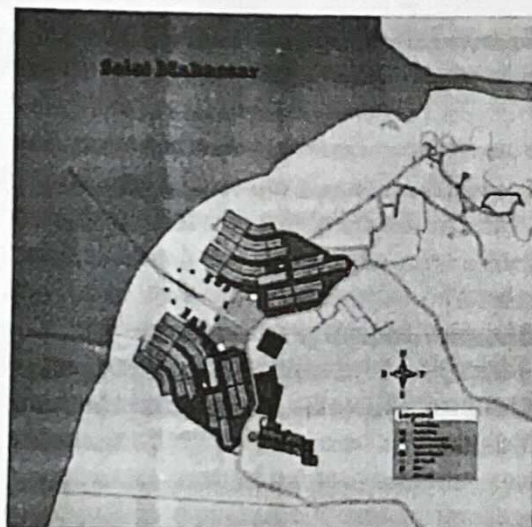


Figure 7. Guideline Zone of Untia District-Biringkanaya
Source: Design Analysis

In this zone it applies Grid and Cluster patterns, as recorded the population is still in small number. the people here work as Farmers and Fishermen. This area is known as Integrated Relocation fishermen region. This pattern is very suitable to apply in Untia concerning its population number is still low.

CONCLUSION

a. Characteristics of Marine Areas/Coastal Areas

- Coastal area is a strategic area because it has topograph which is relatively and easily developed and has very good access (by using sea as movement infrastructure).

- Coastal is rich area in natural resources, both contained in the mainland and in sea space, which is needed to support human needs.

b. Settlement patterns

The formation of a built environment that referring to a settlement , is a functional coordinating process that is based on human activities and the influence of settings (environment) both physically and non-physically (social and culture) that directly affect the pattern of activities and coordinating process. Based on the existing condition of the study area examined from three different locations that obtained three (3) distribution patterns of settlement that is linear in Cambaya, cluster pattern in Sub- Untia district- Biringkanaya while Tallo is a combination between linear and Cluster .

ACKNOWLEDGEMENTS

The concept of settlement arrangement of the coastal area sustainably focuses on the characteristics of its settlements, which are managed with consideration of environmental parameters, conservation, and quality of life, identified comprehensively and integratedly through public cooperation, scientists and governments, to find proper coastal management strategy.

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