

An Introduction Study Of Density And Land Use In Urban Area

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Abstract. The proportion of urban land must have a balance, because it can affect the progress or decline of the city. An unbalanced proportion will cause flooding, drought, pollution, and food production problems. Bandar Lampung which is the location of research on the proportion of land shows the fact that BWK (urban zone) has the main function of more than one function that can threaten each other. To facilitate analysis, the main function of the city is divided into three groups: business, conservation, and other functions. This study shows that business functions use 60.29% of urban area, 21.70% conservation, and other functions 18.02%. The conservation area is in danger of diminishing as conservation functions are mixed with residential and business functions. Bandar Lampung requires a moratorium policy on opening new land for business activities (economy and settlements), but simultaneously encouraging the increase of conservation land area. Bandar Lampung requires the refinement of urban planning documents and improving urban spatial policy. Keywords: Bandar Lampung, land proportion, business, conservation.

1. Introduction

Research on the proportion of land in accordance with the function of the City Region (hereinafter referred to as BWK) has not been done by researchers in Indonesia. In fact, the proportion of land in accordance with the function of BWK will greatly affect the condition of the city in the future. Therefore, the development permit will depend on the direction of urban space policy (Gocmen ZA & LaGro JA, 2016). If the city space gives the wrong direction of development, then the development result will be mistaken too (Victoria Morckel, 2017).

The proportion of land will affect the urban environment (Chukwuedozie K Ajaero & Patience C Onokala, 2013). The proportion of unequal land will lead to floods, droughts, epidemics, disturbance of wild animals, and so on. Environmental issues are of concern to the world because impacts in a region can affect other areas. Since the proportion of land affects the city and global conditions, the proportion of land should receive great attention from governments and urban planners (UN Secretariat, 2008). Greater urbanization will require greater land use. By 2050, there are about 70% of the world's population will live and move in an area, which we call the city (Nadja Kabisch & Dagmar Haase, 2009).

The lack of proportion of land will cause other problems such as social problems, economic and cultural imbalances in people's lives (David Satterthwaite, Gordon McGranahan, Cecillia Tacoli, 2010). Therefore, the proportion of land should be regulated in the Spatial Plan (RTRW) so that the direction of development and utilization of land becomes clear and can be achieved. All development permits within the city area refer to the RTRW document. Therefore, the space functions specified in the RTRW must be appropriate and relevant (Xu M, He C, Liu Z, Dou Y, 2016). Exactly means paying attention to balance in various ways and relevant meaning in accordance with the plan to be achieved in the future.

This requires, the government and urban planner, to be able to draft the document RTRW carefully because it is affecting the shape of the city in the future (Hamam Serag El Din, 2013). As we know, the mistake in building the city will have a major impact on the economy and the environment. The physical improvement of the city will cost big and long time. Cases in Europe can be a reference. Information about it can be found on the website <http://ec.europa.eu/>.

This research was conducted in Bandar Lampung City, Indonesia. Bandar Lampung has a population of about 1 million people and has a fairly varied geographi conditions because there are beaches, plains, hills, and mountains. Therefore, the land functions established through the RTRW document on the BWK distribution should consider the overall land area. This study gives attention to the three functions of land that are business, conservation, and not undefined. We will look at the proportion of land in the functionality. And the limitations in this study are:

1. The research was conducted in Bandar Lampung
2. Using the proportion of land in the past year
3. The proportion of land is divided into three groups: business, conservation and others (not undefined)
4. The division of land proportion will be discussed with the issue of sustainable development that is the minimum open area of 30% of the total city area.

2. Method

Studies on density and land area are widely implemented in some countries (Tobias Plieninger et al, 2013; Andrew L Dannenberg et al, 2003; Michael Batty & Kwang Sik Kim, 1992; Fei Li et al, 2015). This study assists all decision makers and urban planners in designing new locations that have not been studied in detail. The proportion of land based on the function of urban land will affect the progress or decline of the city. The method of measuring the proportion of land can refer to several ways. The required result is the value of the proportion of land that can be a reference to analyze the future of a particular area (Jing Chen et al, 2014; Hans RA Koster & Jan Rouwendal, 2012).

In this research, there are 6 stages of implementation that we do. First: to collect data on BWK and its functions. Equipped with the name of district and land area of each district which will be compiled with BWK area accumulatively. Data obtained from the city government such as the Central Bureau of Statistics and Bappeda Bandar Lampung. Second, perform the processing of population data each BWK and compiled based on the highest and lowest population. The population is one of the city's assets to achieve progress in various fields. The ability to manage human resources will have a major impact on regional progress. Third, analyze every area of BWK. The area will affect many things including challenges in urban environmental management. Large areas will provide an opportunity to utilize the available resources freely, but narrow land will narrow the capacity to achieve regional prosperity.

Fourth; we make comparisons of population and area in each BWK. Comparisons will produce population densities that will give an overview of the population challenges in each BWK. We will also compare the function of each BWK with high density and low density. Fifth; we present the BWK function in the BWK function map. The functions of BWK that we examine are business, conservation and others (not undefined). From the city map based on the BWK function we will be able to know the distribution of all three functions in urban areas that will help us analyze it further. Sixth; after all the functions and BWK have been mapped properly then the next step is to enlarge the area of BWK land in the three groups that is business, conservation and not undefined. This comparison has the objective of knowing the balance of urban land use based on the land use function set by the government.

3. Data & Analysis

Bandar Lampung city is divided into eight regions. Each region has different functions. There is a region that has one function and some that have many functions. The role of each region can be seen in Table 1. From the table we can say that the role of city space consists of: 1) Education, 2) Regional terminal, 3) Housing, 4) Large-scale housing, 5) Business, 6) Seaport, 7) Logistics Terminal, 8) Industry and warehousing, 9) Environmental Conservation, 10) Horticulture, 11) Jungle tours, 12) Government offices, and 13) Beach.

All activities or functions of space are located within a city area that has a particular area and population. And, the list of existing space features in Bandar Lampung City shows the complexity of the function of space that requires an evaluation of the connectedness between each other. Because

there are spatial functions that can conflict with each other if not managed properly. As happened in Region F namely business functions and conservation. If these two functions are not achieved with strictly enforced space management and permissions, then both will beat each other.

Table 1. BWKsin Bandar Lampung

District	Zone	Main function
Kedaton	A	Education, regional terminal and residential
Rajabasa	A	
Tanjung Senang	A	
Sukarame	B	large residential and bussiness
Panjang	C	Seaport, logistic terminal, industri and storage
Tangkung Karang Timur	D	bussiness and industry
Sukabumi		
Tanjung Karang Pusat	E	bussiness
Tanjung Karang Barat	F	bussiness and conservation
Kemiling	G	holticultura, conservation, jungle tour, residential
Teluk Betung Barat	H	Government office, bussiness and beach (tourism)
Teluk Betung Selatan	H	
Teluk Betung Utara	H	

The first step. We collect data on the function of urban land. We get data about the function, from the document RTRW Bandar Lampung. Data functions are divided based on each BWK. Table 1 shows the functions of 13 districts grouped in 8 BWKs that have several functions.

Step two. We will look at the population, area, and density in each BWK. Figure 1 shows BWK H has the highest population and BWK C has the lowest population. BWK H has functions as a government office area, business area and beach (tourism). This area is an old area because the city grows from the shoreline that enter in the area of BWK H. Therefore, this region has a high population. Meanwhile, BWK C has a function as a port area with all its activities so that it has limited settlement.

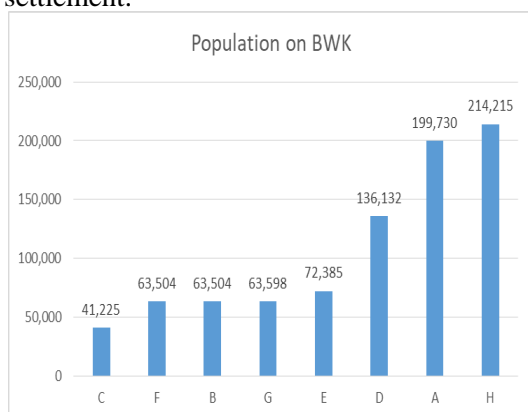


Figure 1. Populationin each BWKs

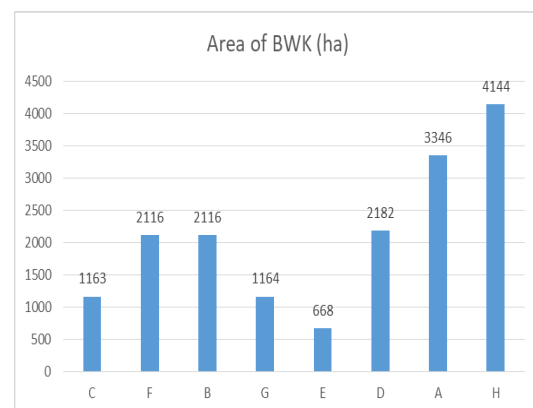
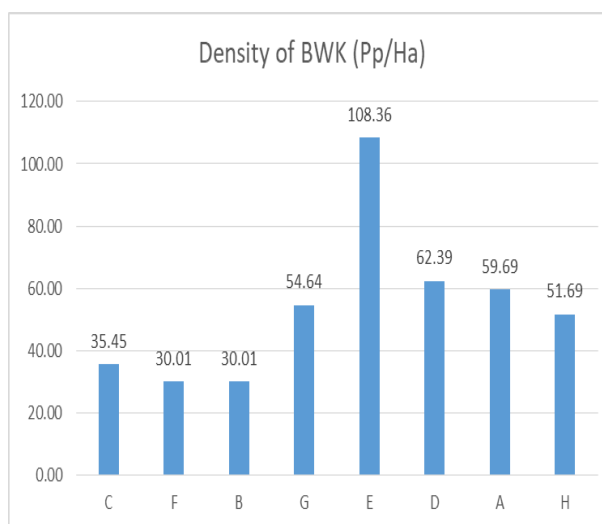


Figure 2. Area of BWKs

The third step is to look at the area in each BWK. BWK H has the most extensive area, while BWK E has the smallest area. BWK H consists of 3 districts so it has a large area because it has the function of the land which is relatively the same and complementary. The explanation of BWK H has been submitted to the explanation of the population. Meanwhile, BWK E is a business area. This area is very small but full of economic activity. If there are some other areas such as BWK E then Bandar Lampung will probably have higher economic activity when compared with current activity conditions.

The fourth step is to look at the density in each BWK. Figure 3 shows that BWK E has the highest density. Population density is the ratio between population and area. BWK E has a low population. BWK E occupies position number 4 as BWK which has the highest population. But BWK E has the smallest area. After comparison between population and area then BWK E has the highest density. While BWK H which has the highest population is in position 5 as the densest BWK in Bandar Lampung.



MAIN FUNCTION	COLOUR
CONSERVATION	Green
BUSSINESS	Red
UN-DEFINITION	Yellow

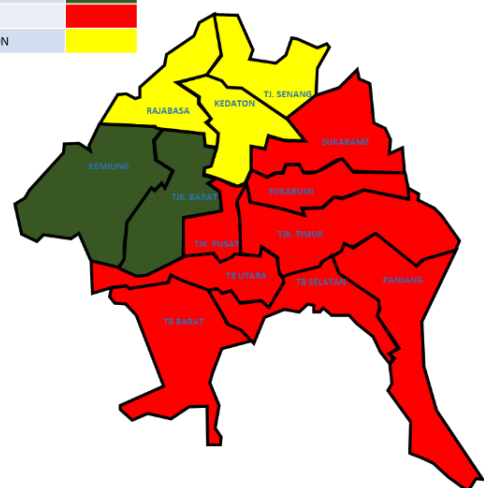


Figure 3. Density of BWK

Figure 4. urban map base on function

The study on density in Bandar Lampung shows that the highest density is in BWK E as a business area. There are several BWKs that also become business areas, they are BWK B, BWK D, BWK E, BWK F, and BWK H. Although, only BWK E is devoted as a business area. However, BWK F and BWK B have the lowest density. BWK F has a low density because it has a mixed function with conservation activities. Meanwhile, BWK B has a low density because it has other functions as a residential area.

The fifth step. We divide land use functions into three categories: business activities, conservation activities and other activities (undefenition function). This research emphasizes on business function and conservation function because these two functions will be suppressing each other. Figure 3 shows the map of the subdivision of the city based on the three functions. The red color indicates the business function, the green color indicates the conservation function, and the yellow color indicates the undefined function. A map of the city map based on the proportion of each function gives us an understanding that the area of business land already dominates the city area. In fact, this study still refers to the designation of land in accordance with urban spatial planning (RTRW).

Step six. The proportion of land based on the function set by RTRW needs to be seen from the quantitative side. Based on the overall division of land, business land covers 60.29% of the total city

area. The conservation function has an area of 21.70% of city area. Meanwhile, the undefined function is 18.02%. This undefined function has a tendency to business functions.

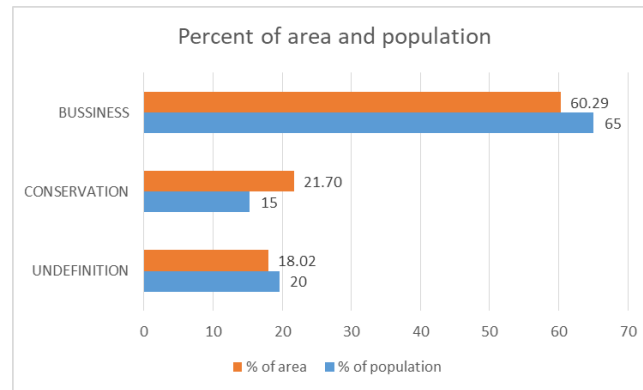


Figure 5. Land proportion base on function plan in RTRW Bandar Lampung (Urban planning and design)

4. Discussion

The division of functions of each BWK still creates a problem that is the function of each BWK consists of several main functions. In fact, every BWK should have one main function for the direction of the development of the region can be more clear. If each BWK has one main function, then the direction of BWK development will be clearer and easier to set. The government will be easy in setting programs and policies, the private sector will be easy to identify the business they will carry out, and the community will be easy to monitor the function of the region in order to stay in accordance with the previous plan.

The composition of land functions is divided into three activities: business, conservation activities and undefined activities. From the previous analysis, the proportion of land of each BWK function has shown the critical condition for the environment. The conservation area has an area of 21.70%. Conservation land should be wider than this number. Moreover, land use for other activities, combined in the business activity criteria, will be higher. This will be the cause of the decreasing extent of conservation land. High threats occur to areas with conservation functions.

The ideal proportion of land between business functions and conservation functions is 60%: 40% or at least 70%: 30%. The proportion of land will indicate the direction of future development. Proportion of land by function will greatly influence the development model in urban areas. The government should pay attention to the proportion of land in order to avoid major imbalances in urban land use.

5. Conclusion

The conclusions in this study are:

1. The highest population density is in the area that has a function as a business area.
2. Proportion of land with business function covers 60.29%.
3. The government should make policies to safeguard conservation land. In fact, there should be an increase in the area of conservation land
4. If the city of Bandar Lampung no policy on land use then it will have an impact on the imbalance and damage to urban environment.

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