

Geographic Information System For The Mapping Of Value Land Zone Of District Bengkong Based On AHP Analysis

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Received: May 18, 2017

Accepted: July 31, 2017

Published: August, 01, 2017

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Abstract

Information on the value of land in Indonesia is still very minimal and difficult to be known by the public, particularly in the area of Bengkong, it also results in the presence of new activity for land speculators who want to grab a great advantage in providing value land pricing-related information. The purpose of this research is to create The Value Land Zone Map (VLZ) that illustrates the value of land is relatively the same as delivering lines and different colors on each value owned and accompanied the which factors affected it, as well as presenting a price comparison between the village and the land on map in the form of the web. Spatial analysis and Analytical Hierarchy Process can be used for weighting for the most influential parameters and has no effect, so that the AHP can be useful to assist in decision making. VLZ obtained by observation in the field using a questionnaire. Observation and interviews were done with the technique of sampling purposive namely the selection of the sample with the groups in the number of smallest unit of the score. Samples were taken as many as 25 pieces. The result of the research in the form of web map VLZ with 6 classifications of land price, the prices that Bengkong area concentrated settlement areas as Rp 3.500.000/sqm for the land prices are the highest in the village of Bengkong Sadai, because it's located near the city centre and has adequate social facilities.

Keywords: *Map of Value Land Zone, Bengkong, Web, AHP*

1. Introduction

Bengkong subdistrict is one sub-district in the Government of Batam city. Sub Bengkong concentrated as municipalities with an area of ± 13.12 km² and inhabited by residents as much as ± 104,398 the soul consists of 4 wards namely Sadai, Tanjung Buntung, Bengkong Indah, and Bengkong Laut. With the increasing number of inhabitants over the years led to a need for land is becoming increasingly large in comparison with the State of the land that nature anyway. It makes some areas in district Bengkong land price has a value that varies.

The system of land in Batam city with different systems of land in the territory of the other, that the Government of Indonesia gave the management of the island of Batam, Batam Authority to (BP Batam). The management rights are granted for a period of time during which the land is used for the development of industrial areas, ports, tourism, fisheries, farms, settlements, and other business related to it since the listed accounts to the head of the local Land Office (Pramithasari, 2017). In the regulation of the Agrarian State Minister/Head of The National Land Agency No. 9 of 1999 stipulates that the management rights are

aligned with the right of ownership, Buildings and usage rights (Anggraeny, 2014).

Most of the people are still difficult to obtain information on the value of land prices is causing growing land speculators. Therefore the necessary research on the mapping Value Land Zone in district Bengkong. Map of VLZ is the geographical zone which consists of a group of parcels of land that illustrate the value soil that is relatively the same. The price of the different land values due to several factors including the welcome layout of the location, accessibility, social factors, environmental quality, public facilities and social facilities, infrastructure conditions, as well as the fertility of the soil. (Prasetya and Sunaryo, 2013).

VLZ can be obtained by conducting observations in the field. The sampling technique used was purposive sampling which means the selection of samples due to certain destinations (Setiawan, 2007) in accordance with the weighting and scoring are done using spatial analysis and AHP, namely the large number of the population that will be made of the sample obtained from the total dignity of the parameter or the score on an influential factor and has no effect. The technology of geographic information

systems (GIS) are growing rapidly so that it can be utilized as one of the basic ingredients of a web-shaped decision-making.

1.1. Research Objective

The purpose of research:

- Generate a map value land zone in district Bengkong.
- Knowing the factors that affect the value of land in district Bengkong.
- Compare prices of land between subdistricts Bengkong.
- Generate Web Value Land Zone (VLZ) sub-Bengkong.

1.2. Benefit of Research

The benefits of research:

- Help communities especially in district Bengkong in term of the giving of the information about the value of line prices.

- To improve the assessment of VLZ which includes districts that exist in Batam city.
- The result of this research can be used as a medium of information for BPN Batam city in updating the data value of the land.
- The value land generated can be a reference to the community in decision making, so that the possibility of land speculators can be minimized.

2. Research Methods

2.1 Location of the Research

The location of this research lies in the district which lies between Bengkong -0°25'29" N – 1°15'00" N dan 103°34'35" E – 104°26'04" E. Bengkong subdistrict consists of 4 wards namely Bengkong Laut, Bengkong Indah, Sadai, and Tanjung Buntung. Time study starting form August 8 2016, and the data processing takes place for 5 months. Location map of the research can be seen in Figure 1.

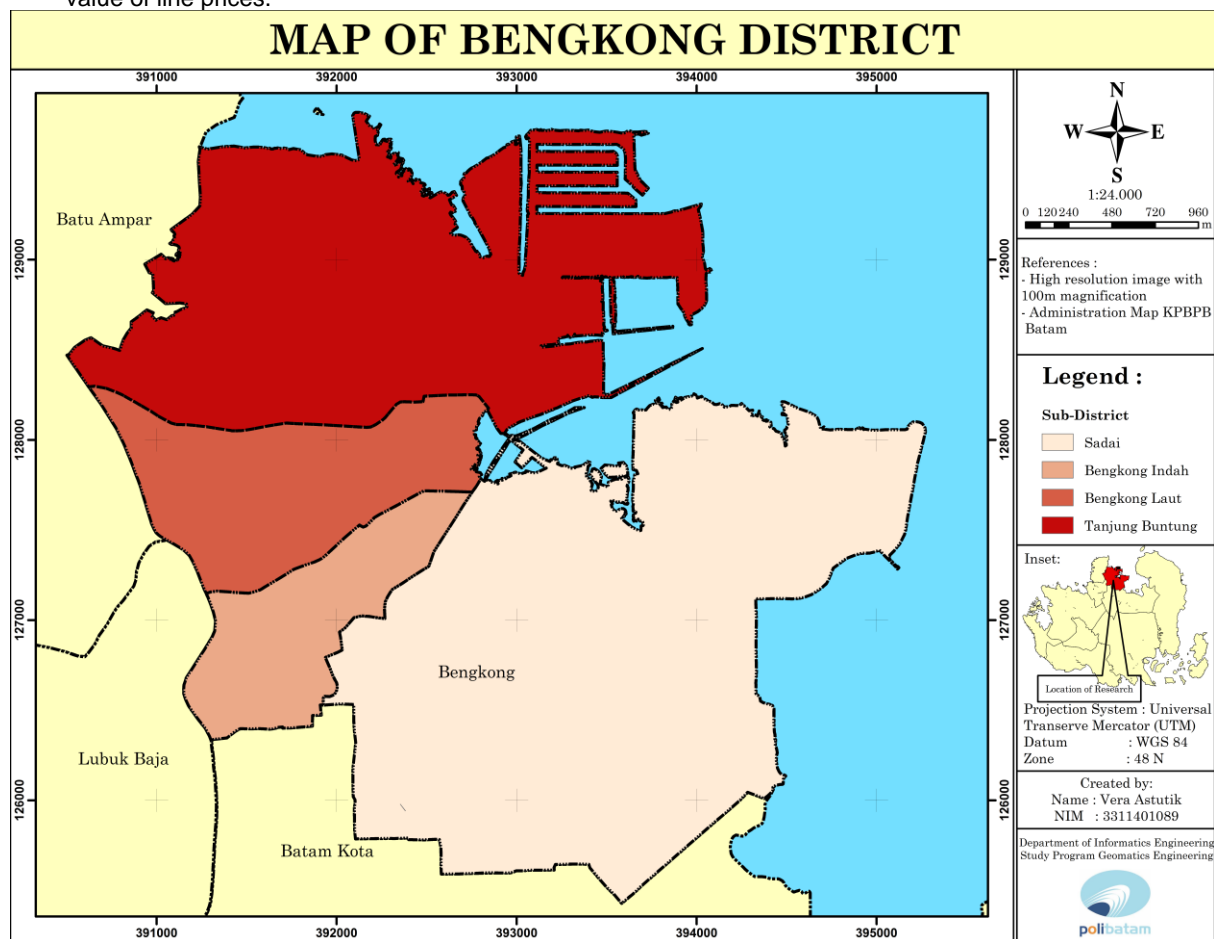


Figure 1. Map of Bengkong District

2.2 Factors that Affects the Price of Land

According to Fahirah (2012), factors that affect the value of land is the availability of transportation network, clean water, electricity networks, road conditions, and the land area. While according to Rusdi (2013), factors that affect the price of land starting from distance against the rim, elevation, distance towards the center of activities, zoning, the travel time to the city center, topography, land area, and type of land use.

2.3 Analysis of AHP and Scoring

Google earth image data retrieved using software ElshayalSmart then in the export and digitize done directly with Administrative boundaries map (Farizki and Anurogo, 2017). The results of weighting and scoring against the parameters which can be seen visually with google earth imagery such as facilities, infrastructure, and so on, because the google earth imagery has the ability visually building represents

(Lubis *et al.*, 2017). Visualization can also be used by using the UAV Photogrammetry results in the form of high-resolution image (Anurogo *et al.*, 2017). Example of spatial analysis using AHP analysis is easier with a map because it can examine the deeper study, especially in transport planning (Taki and Lubis, 2017).

Khairina (2016) stated that by using AHP Analysis based on perceptual experience by this analysis is represented as a hierarchy where there are several levels, the first is the goal, a second-level criteria or factors, and third level alternatives. With the hierarchy that is created can solve complex problems into groups that are more structured and systematic way, so that it can help in decision-making.

Hidayati (2013) stated that in the scoring of some parameters which influence the value soil, namely the land use, land accessibility, and comprehensiveness of public facilities. The granting of the weighting on each parameter vary based on the level of influence these parameters (Aprilliyanti and Lubis, 2017). Sub Bengkong concentrated settlement for the area can be classified and given a score as in Table 1.

Table 1. Classification and Scoring of Landuse

No	Landuse	Class	Score
1	Comercial and Service Land	I	4
2	Settlement and Industrial Land	II	3
3	Empty Field	III	2
4	Paddy Field and Moor Land	IV	1

Things that affect the price of the land can be seen from land accessibility such positive distances towards the road arteries, collector streets, distance against educational institutions, as well as the distance towards the Government offices. Land classification and positive score can be seen in Table 2.

Table 2. Classification and Scoring Positive Land Accessibility

No	Positive Land Accessibility	Criteria (m)	Class	Score
1	Distance to the Arterial Road	<50	I	4
		50-150	II	3
		150-500	III	2
		>500	IV	1
2		<50	I	4

No	Positive Land Accessibility	Criteria (m)	Class	Score
	Distance to the Local Road	50-150	II	3
		150-500	III	2
		>500	IV	1
3	Distance to Educational Institutions	<200	I	3
		200-500	II	2
		>500	III	1
4	Distance to Government Office	<200	I	3
		200-500	II	2
		>500	III	1

The area that has the completeness of public facilities can have an effect on land prices. The completeness of public facilities can be calculated with the smallest union territory of the region is the village. As for the formula used is as follows:

$$IKU = \frac{\text{number of completeness of public facilities}}{\text{village area}} \quad (1)$$

Information:

IKU : Intensity of General Completeness

2.4 Spatial Analysis

Spatial analysis also called geoprocessing is processing, processing and analysis of data-based spatial. Spatial analysis is used, among others, are multiple ring buffers, overlays, and dissolve. Spatial analysis starts from the process of multiple ring buffers, where the buffer done per parameters/factors that affect the price of land values. Overlay process is undertaken against the results of multiple ring buffers per parameter. The result of the overlay can be used a reference in determining the number of samples to be taken in the field.

For the primary data obtained from the result of the observation from through land was taken on samples that have been taken into consideration and scrutiny, so as to achieve accurate results in research. The overall result will be made into ArcGIS plotting to manufacture map value land zone. VLZ data that has been retrieved is inserted into a table for the creation of a price comparison table. In web creation that includes a map value land zone, the value of the land price comparison table, and map classification parameters. All result obtained at will be presented into the web. Design research can be seen in Figure 2.

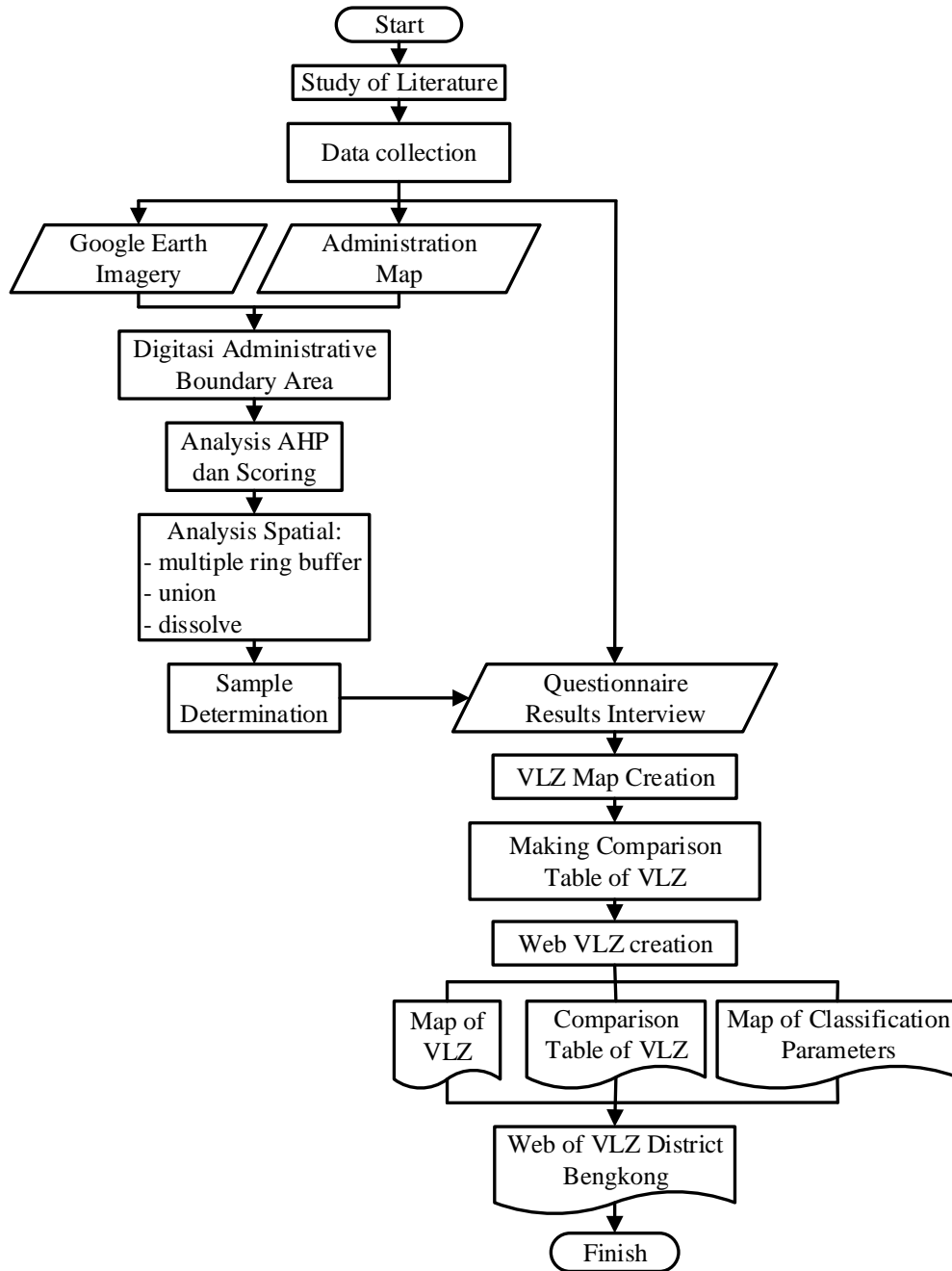


Figure 2. Reseach Design

3. Result and Discussion

3.1 Analysis of AHP

AHP analysis of weighting per parameter, weighting the end to determine the most influential parameter is contained in table 1.

Table 3. Weighting Value

No	The Determining Factors of Land Price	Weighting Value
1	Land Use	3
2	Positive Land Accessibility	2
3	The Completeness of Public Facilities	1

Based on the parameters of the existing weighting is given to the most influential parameter with a value of high weights and parameters have no effect is given a low weighting value.

Land use given the highest weight value since land use is the most influential parameter against the price of the land, such as land that is concentrated for trade and services value of land prices will be higher because the economic value generated by the land. While the completeness of public facilities is given the value of the lowest weights due to the form of the parameters of other influential parameters. Land use, land accessibility, and comprehensiveness of public facilities is a parameter which can be seen visually using the google earth image and can be used as a parameter/main factors.

Some other parameters which can not be seen visually, such as social factors, the quality of the environment, the condition of the infrastructure, and the fertility of the land, can be obtained by conducting

field observations, so that with the analysis of AHP there are 8 main criteria and some of the alternative criteria that are described in the form of hiraki in Figure 3.

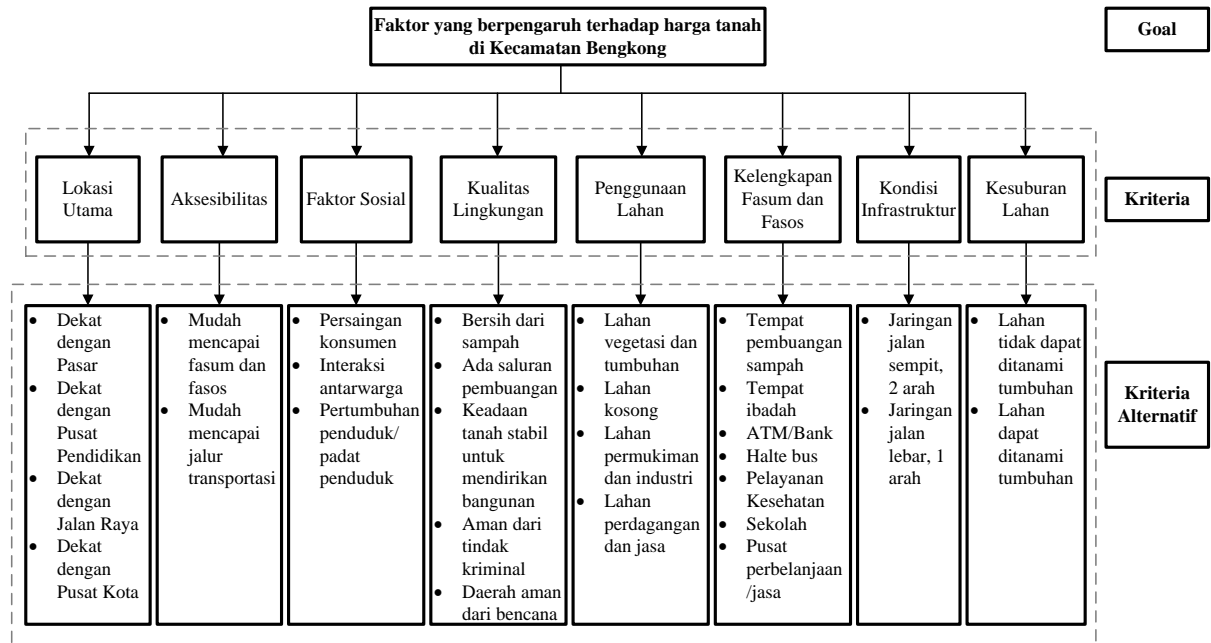


Figure 3. Analysis of AHP Hierarchy Diagram Based on the Result of Observation

From Figure 3, it can be noted that the purpose of the research that is done to find out what parameters the most influence on land price in district 8 Bengkong of criteria i.e. Prime location, accessibility, social factors, environmental quality, land use, completeness of public facilities and social facilities, the condition of the infrastructure, and the fertility of the land. Of 8 these criteria have been made a field observation results are as follows:

- On the main location parameters that are most influential in a row is close to the city centre, highways, schools and markets.
- On the accessibility of the most influential parameters in a row is easy to reach the public facilities and social amenities and easy reach transportation.
- Social factors on parameters of the most influential in a row were overcrowding, interactions between citizens, consumers and competition.
- On the parameters of the most influential environmental quality in a row is safe from

criminals, the State land to erect the building stable, clean of litter, the area is safe from disaster, and there's a sewer.

- On land use parameters that are most influential in a row are a settlement in the land of land and industry, trade and services, land, and land vegetation or plants.
- On the parameters of public facilities and social amenities that are most influential in a row are schools, shopping centers or services, health services, places of worship, ATM/Bank, and garbage dumps.
- On the parameters of the condition of the infrastructure, the most influential in a row is a wide road network i.e. 1 direction and narrow road network that is 2-way.
- On land fertility parameters of the most influential in a row is the land can be cultivated crops and land cannot be cultivated plants.

3.2 Spatial Analysis and Sample Determination

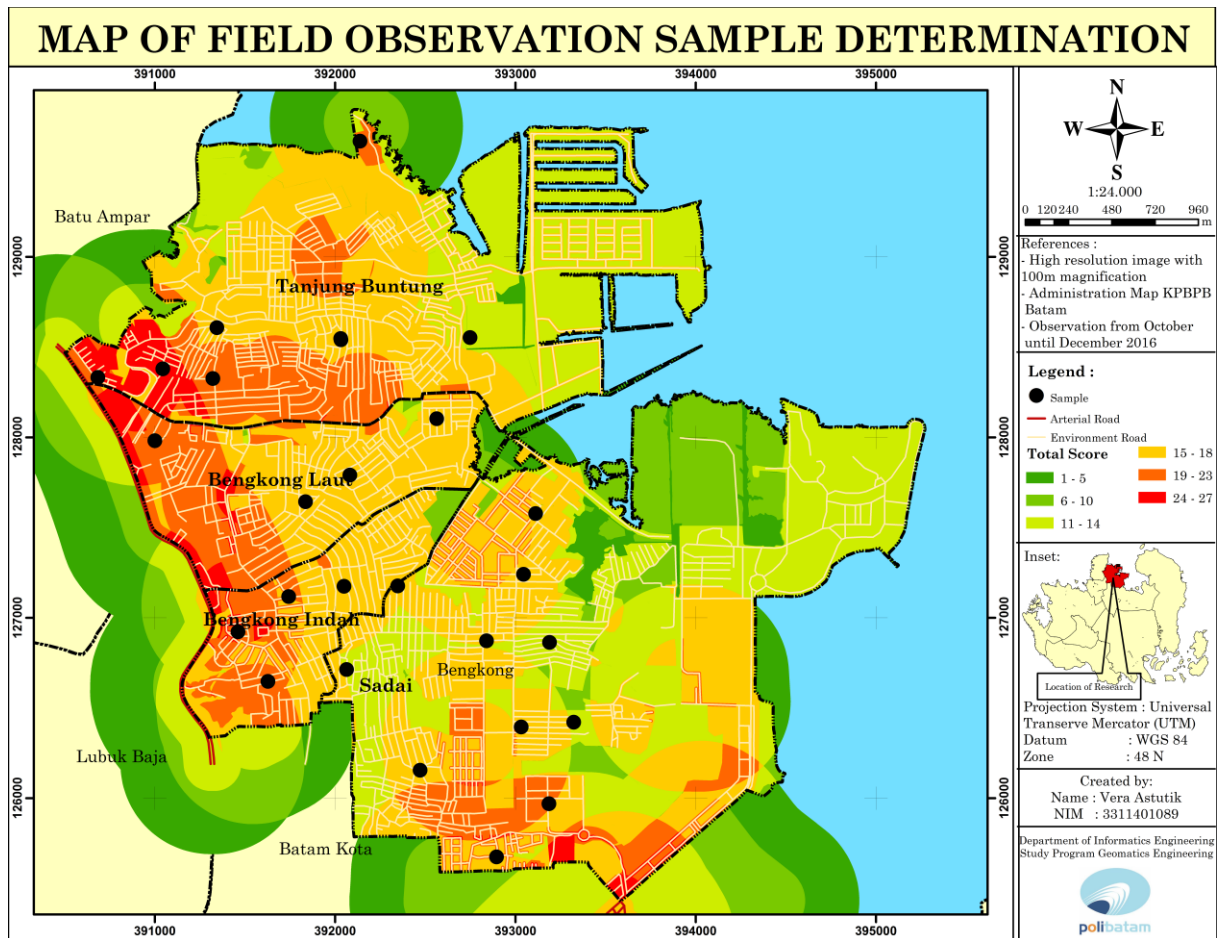


Figure 4. Map of Field Observation Sample Determination

From the pictures, it can be known that there are 6 classification parameters. This map is useful to determine the number of samples to be taken, where the population is the total score of some parameters. The population was 27 with a confidence level of 95% obtained samples as many as 25 samples.

In this regard, the creation of map classification using spatial analysis and AHP analysis. The spatial analysis used is geoprocessing, where tools used include multiple ring buffers, merge, and dissolve the union. These tools are useful to give scores and the total price, as well as combining multiple parameters into a single entity which is then used for sampling.

As for the Division of the classification contained in the map as follows:

- For the highest score is the first highest classification given the color red parent who score totals ranged from 23-27 that are scattered in an area close to the arterial road, close to the city center, and the school which is the classification of land use in the form of settlements and industry.
- For the second-highest classification given by Orange, range score totals 19-22, scattered in an area close to the school and remained in close proximity with the arterial road which is the classification of land use in the form of settlements and industry.

- The third highest Classification given yellow color with a total score of the 15-18 range that still come within a close proximity to the school.
- For the classification of the four colored light green with a score total range in 10-14, scattered close to the lowest arterial road, land use in the form of settlements and land empty.
- For the fifth classification given green a bit old with 6-9 total score range spread over land use in the form of empty land and the environment.
- The sixth Classification given the color green with the 1-5 total score range is only supported by the environment.

From the results of the field survey that has been done to prove that some of the parameters that have been determined do not fully reflect the actual land price. That is because of the different viewpoints of any society against the existing parameters. Not completely mean only the most influential parameter and has no effect that corresponds to the actual land price, so most of the others are not appropriate because of the existence of external factors that are known to the public in General regarding the status of land in Batam city.

Some parameters of spatial analysis conducted were the location of a location close to town, schools, the main arterial road or street, the street environment, land use, and completeness of public

facilities, do not fully reflect the actual land price. That is because the system of land in Batam city are managed by BP Batam in contrast to other areas. Soil that does not yet have the clarity will land or ownership

is said to be in a status of usage rights has the land price is low compared to the soil that has possess has had the clarity or say in the status of property rights and usage rights.

3.3 The Map Value Land Zone

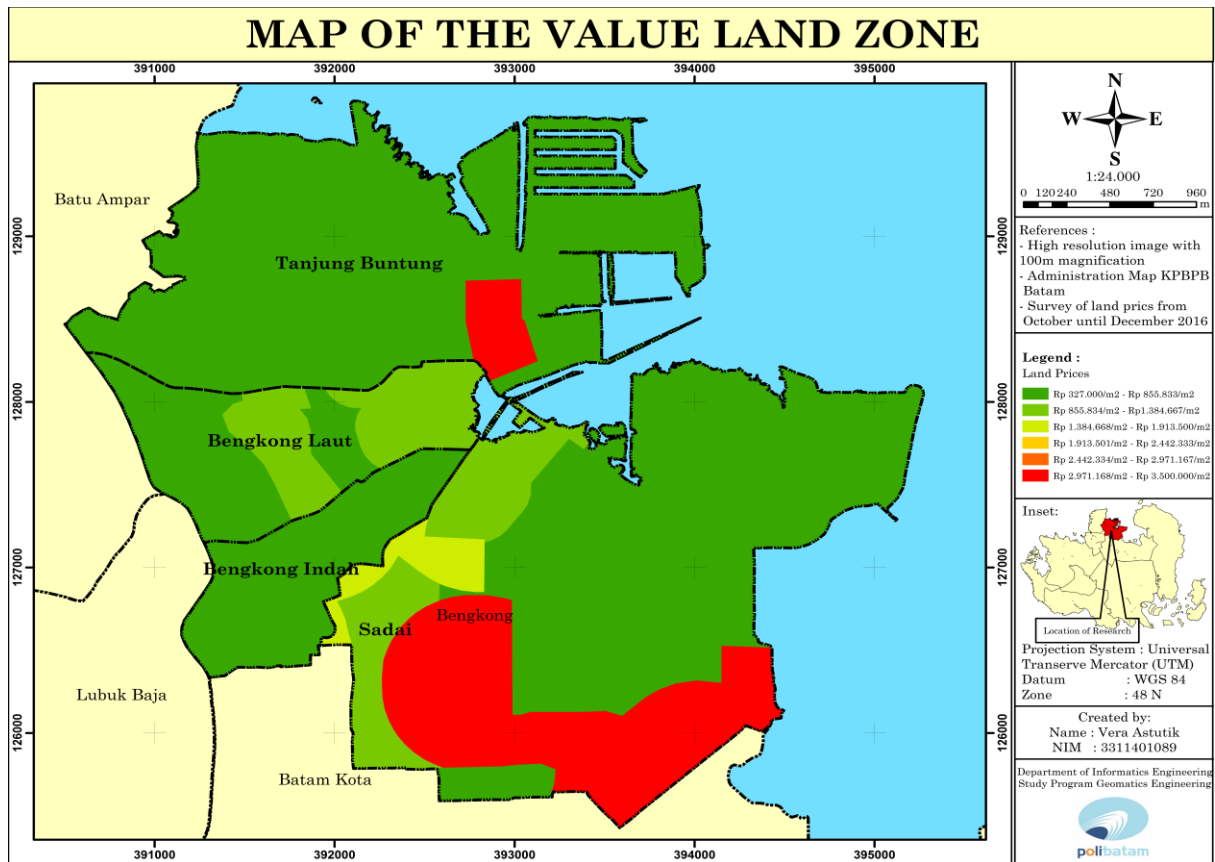


Figure 5. Map of The Value Land Zone

The VLZ map presented in Figure 4 is the VLZ in district Bengkong. Of the image can be seen in the price range values the land at sub-Bengkong, for the lowest price is IDR 327.000/sqm is located in the village of Tanjung Buntung and for the highest price is IDR 3.500.000/sqm is in village Sadai. Price range the value soil obtained from statistical calculations i.e. rules that classify Sturges data based on the number of data and dividing it into multiple groups with the same range.

The calculation of the price range land with Sturges as follows:

$$R = \text{Largest value} - \text{Smallest value} \quad (2)$$

$$K = 1 + 3.3 \log n \quad (3)$$

Description:

K = The number of classes

n = The size of data

$$I = \frac{R}{K} \quad (4)$$

Description:

I = Class Interval

R = Range

K = The number of classes

Batas kelas bawah + 1 + I (5)

Description:

I = Class Interval

From Figure 5 it can be retrieved for each administrative village land price details based on factor/parameters that affected it, namely:

- The village of Tanjung Buntung

The village is the village of Tanjung Buntung directly adjacent to Batu Ampar Subdistricts. In this neighborhood do not much has facilities both public and social facilities. Land use in this area in the form of land settlement, empty land, vegetation or forests. The highest and lowest price is located in the land the settlements ranged between IDR 3.400.000/sqm, the highest being in the sea, land settlement Bengkong is the upscale residential land and hospitality and the entertainment district. IDR 327.000/sqm for the lowest land price is a neighborhood located in caving old.

- The Village of Bengkong Laut

The village is the village Bengkong Laut directly adjacent to Batu Ampar Subdistricts. The village has a wide range of public facilities and social facilities which are quite complete, ranging from markets, industries, schools, hospitals, ATMs, and banks.

Land use in this area in the form of settlements, industry, trade, and services. The highest and lowest price is located on of land between the settlements of IDR 1.000.00/sqm for the highest and IDR 365.000/sqm for the lowest.

- The Village of Bengkong Indah

The village is a Pictures village Bengkong that Sub Batu Ampar borders and Sub Batam city. For the use of its land in the form of settlement, trade, and services that form the market, bank, ATM, cooperative, and schools. In the village is the highest land prices to be in the Bengkong IDR 750.000/sqm, for the lowest are in Bengkong Indah I with price range IDR 500.000/sqm.

- The Village of Sadai

The village is the village Sadai directly adjacent to the Batam Kota and the Sub-District of the Batam Kota. It makes the price of land in the village is very high, for land use settlement, trade, and services, as well as the empty ground. The village has a public complete, ranging from markets, cooperatives, hospitals, clinics, schools, and so on. The highest land prices to be in the dominant Bengkong Nusantara with high-class neighborhoods housing i.e. IDR 3.500.000/sqm. For the lowest land price is in the range from Sadai Bengkong IDR 533.000/sqm.

Comparison between land prices there is high-level wards in the village of Tanjung Buntung and Sadai which reached 27:2 which is located in the old Hometown for the village of Tanjung Buntung with land prices range from IDR 327.000/sqm in the with the land price Bengkong Nusantara IDR 3.500.000/sqm which is in village Sadai. It proves that the village Sadai which has adequate public facilities with a fairly dense population density compared to other wards, as well as access will be downtown or Central Government easily, making it a region with a relatively high land price.

Comparison between land price levels was found in the village Bengkong Indah and Bengkong Sadai reached 5:6 which is located in the Bengkong Indah and Bengkong Kolam that reached IDR 729.000/sqm, while the Bengkong Indah IDR 600.000/sqm. That is because the completeness of public facilities is adequate in village Sadai compared to Village Bengkong Indah.

Price comparison of ground between low-level village offices are located at the village Tanjung Buntung and Bengkong Laut reached 1:2 which was located in the Bengkong Laut and Bengkong Abadi recently for a price of IDR 469.000/sqm, where as Bengkong Laut with IDR 1.000.000/sqm. That is because the Bengkong Laut has the completeness of public facilities that are at Bengkong Laut and road network which is easy to reach by public transport as compared with the area surrounding the Bengkong Abadi Baru. As for the details of the comparison of each village are present in table 4.

3.4 Comparison of Land Price

With the comparison of the price land in the village to Bengkong has done the survey before it can become a reference for the public in decision making.

Table 4. Comparison of The Price Land between Village

Kelurahan	Tanjung Buntung						Bengkong Laut						Bengkong Indah						Sadai							
	KT	AB	PL	A1	A2	GR	BL	LA	PR	H1	RT	BBR	BI1	BI	BAL	SD1	SD2	KL1	KL2	BIS	NS1	NS2	BTI	BI2	KH	
Tanjung Buntung	KT	1	1:2	1:3	1:2	2:5	2:5	1:13	1:4	2:3	2:7	2:3	1:3	1:2	2:5	2:5	1:2	2:5	1:3	2:11	2:5	2:27	2:23	1:4	2:3	
	AB	2:1	1	2:3	1	4:5	4:5	2:13	1:2	4:3	4:7	4:3	2:3	1	4:5	1	2:5	1	4:5	2:3	4:11	4:5	4:27	4:23	1:2	4:3
	PL	3:1	3:2	1	3:2	6:5	6:5	3:13	3:4	2:1	6:7	2:1	1	3:2	6:5	1	3:5	3:2	6:5	1	6:11	6:5	6:27	6:23	3:4	2:1
	A1	2:1	1	2:3	1	4:5	4:5	2:13	1:2	4:3	4:7	2:3	3:2	1	4:5	1	2:5	1	4:5	2:3	4:11	4:5	4:27	4:23	1:2	4:3
	A2	5:2	5:4	5:6	5:4	1	1	5:26	5:8	7:3	5:7	5:3	5:6	5:4	1	1	1:2	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
	GR	5:2	5:4	5:6	5:4	1	1	5:26	4:8	5:3	5:7	5:3	5:6	5:4	1	1	1:2	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
Bengkong Laut	BL	13:1	13:2	13:3	13:2	26:5	26:5	1	13:4	26:3	26:7	26:3	13:3	13:2	26:5	26:5	13:5	13:2	26:5	13:3	13:11	26:5	26:27	26:23	13:4	26:3
	LA	4:1	2:1	4:3	2:1	8:5	8:5	4:13	1	8:3	8:7	8:3	4:3	2:1	8:5	8:5	4:5	2:1	8:5	4:3	8:11	8:5	8:27	8:23	1	8:3
	PR	3:2	3:4	1:2	3:4	3:7	3:5	3:26	3:8	1	3:7	1	1:2	3:4	5:3	3:5	3:10	3:4	3:5	2:1	3:11	3:5	1:9	3:23	3:8	1
	H1	7:2	7:4	7:6	7:4	7:5	7:5	7:26	7:8	7:3	1	7:3	7:6	7:4	7:5	7:5	7:10	7:4	7:5	7:6	7:11	7:5	7:27	7:23	7:8	7:3
Bengkong Indah	RT	3:2	3:4	1:2	3:2	3:5	3:5	3:26	3:8	1	3:7	1	1:2	1	3:5	3:5	3:10	3:4	3:5	1:2	3:11	3:5	1:9	3:23	3:8	1
	BBR	3:1	3:2	1	2:3	6:5	6:5	3:13	3:4	2:1	6:7	2:1	1	3:2	6:5	6:5	3:5	3:2	6:5	1	6:11	6:5	6:27	6:23	3:4	3:1
	BI1	2:1	1	2:3	1	4:5	4:5	2:13	1:2	4:3	4:7	1	2:3	1	4:5	4:5	2:5	3:1	4:5	2:3	4:11	4:5	4:27	4:23	1:2	4:3
	BI	5:2	5:4	5:6	5:4	1	1	5:26	5:8	5:3	5:7	5:3	5:6	5:4	1	1	1:2	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
Sadai	BAL	5:2	1	5:6	1	1	1	5:26	5:8	5:3	5:7	5:3	5:6	5:4	1	1	2:1	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
	SD1	5:2	5:2	5:3	5:2	2:1	2:1	5:13	5:4	10:3	10:7	10:3	5:3	5:2	2:1	2:1	1	5:2	2:1	5:3	10:11	2:1	10:27	10:23	5:4	10:3
	SD2	2:1	1	2:3	1	4:5	4:5	2:13	1:2	4:3	4:7	4:3	2:3	1:2	4:5	4:5	2:5	1	4:5	3:2	4:11	4:5	4:27	4:23	1:2	4:3
	KL1	5:2	5:4	5:6	5:4	1	1	5:26	5:8	5:3	5:7	5:3	5:6	5:4	1	1	1:2	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
	KL2	3:1	3:2	1	3:2	6:5	6:5	3:13	3:4	1:2	6:7	2:1	1	3:2	6:5	6:5	3:5	3:2	6:5	1	6:11	6:5	6:27	6:23	3:4	3:1
	BIS	11:2	11:4	11:6	11:4	11:5	11:5	11:13	11:8	11:3	11:7	11:3	11:6	11:4	11:5	11:5	11:10	11:4	11:5	11:6	1	11:5	11:27	11:23	11:8	11:3
	NS1	5:2	5:4	5:6	5:4	1	1	5:26	5:8	5:3	5:7	5:3	5:6	5:4	1	1	1:2	5:4	1	5:6	5:11	1	5:27	5:23	5:8	5:3
	NS2	27:2	27:4	27:6	27:4	27:5	27:5	27:26	27:8	9:1	27:7	9:1	27:6	27:4	27:5	27:5	27:10	27:4	27:5	27:6	27:11	27:5	1	27:23	27:8	9:1
BTI	23:2	23:4	23:6	23:4	23:5	23:5	23:26	23:8	23:3	23:7	23:3	23:6	23:4	23:5	23:5	23:10	23:4	23:5	23:6	23:11	23:5	23:27	1	23:8	23:3	
Sadai	BI2	4:1	2:1	4:3	2:1	8:5	8:5	4:13	1	8:3	8:7	8:3	4:3	2:1	8:5	8:5	4:5	2:1	8:5	4:3	8:11	8:5	8:27	8:23	1	8:3
	KH	3:2	3:4	1:2	3:4	3:5	3:5	3:26	3:8	1	3:7	1	1:3	3:4	3:5	3:5	3:10	3:4	3:5	1:3	3:11	3:5	1:9	3:23	3:8	1

Description:
SADAI

SD1 : Bengkong Sadai
SD2 : Bengkong Sadai



KL1 : Bengkong Kolam
 KL2 : Bengkong Kolam
 BIS : Bengkong Indah Swadebi
 NS1 : Bengkong Nusantara
 NS2 : Bengkong Nusantara
 BTI : Bengkong Telaga Indah
 BI2 : Bengkong Indah II
 KH : Kampung Harapan

TANJUNG BUNTUNG

KT : Kampung Tua
 AB : Bengkong Abadi Baru
 PL : Bengkong Polisi
 A1 : Bengkong Asrama
 A2 : Bengkong Asrama
 GR : Bengkong Garama
 BL : Bengkong Laut

BENGGKONG LAUT

LA : Bengkong Laut
 PR : Bengkong Permai
 H1 : Bengkong Harapan 1
 RT : Bengkong Ratu

BENGGKONG INDAH

BBR : Bengkong Baru
 BI1 : Bengkong Indah 1
 BI : Bengkong Indah
 BAL : Bengkong Aljabar

4. Conclusions

Based on the research that has been done, the conclusion that the Value Soil zone map in district Bengkong produced is able to provide information regarding the distribution of land prices in district Bengkong per meters square in four wards with 6 classifications. The classification is done using the rules of Sturges for the determination of the class, the class interval and range. On a map of classification parameters that are carried out with the analysis of spatial analysis with AHP and diagrams generated is able to provide information on the factors that affect the price of the land. Where the highest land price is located in the area close to the city center reached Rp 3,500,000/m², with the classification of land use is a settlement in the administrative area of the village and is the social facilities Sadai very adequate.

Land price comparison table produced is able to provide information and price comparison the land between villages, so that they can help the community in taking decisions and the results of Web Map ZNT in district Bengkong can provide information on land price per meters square is easily accessible in a cheap, easy, and efficient.

Acknowledgements

The author would like to thank the Government of Subdistrict Bengkong who have given permission to conduct a survey of land prices in district Bengkong, so that research can be run well. As for help from peers and professors supervising Engineering Geomatics State Polytechnic Batam which have helped in the process of processing and presentation of research data, so that the author can complete the research properly and on time.

5. Reference

- Anggraeny, I. (2014). Akibat Hukum Insinkronisasi Pengaturan Bidang Pertanahan Di Kota Batam. *Jurnal Mahasiswa Fakultas Hukum*, 1(1), 1-29.
- Anurogo, W., Lubis, M. Z., Khoirunnisa, H., Pamungkas, D. S., Hanafi, A., Rizki, F., ... & Lukitasari, C. A. (2017). A Simple Aerial Photogrammetric Mapping System Overview and Image Acquisition Using Unmanned Aerial Vehicles (UAVs). *Journal of Applied Geospatial Information*, 1(01), 11-18.
- Aprilliyanti, T., & Zainuddin, M. (2017). Pemetaan Potensi Kekeringan Lahan se-pulau Batam menggunakan Teknik Sistem Informasi Geografis (SIG) dan Penginderaan Jauh. *Majalah Geografi Indonesia*, 31(1), 90-94.
- Fahirah, F. (2012). Identifikasi Faktor Yang Mempengaruhi Nilai Jual Lahan Dan Bangunan Pada Perumahan Tipe Sederhana. *SMARTek*, 8(4), 251-269.
- Farizki, M., & Anurogo, W. (2017). Pemetaan kualitas permukiman dengan menggunakan penginderaan jauh dan SIG di kecamatan Batam kota, Batam. *Majalah Geografi Indonesia*, 31(1), 39-45.
- Hidayati, I. N. (2013). Analisis Harga Lahan Berdasarkan Citra Penginderaan Jauh Resolusi Tinggi. *Jurnal Geografi Gea*, 13(1), 57-71
- Khairina, D. M. (2016). Analytical Hierarchy Process Sebagai Pendukung Keputusan (*Decision Support*) Pemilihan Lokasi Pembangunan Rumah Kos Untuk Karyawan. *Jurnal Informatika Mulawarman (Jim)*, 7(3), 75-81.
- Lubis, M. Z., Anurogo, W., Gustin, O., Hanafi, A., Timbang, D., Rizki, F., ... & Taki, H. M. (2017). Interactive modelling of buildings in Google Earth and GIS: A 3D tool for Urban Planning (Tunjuk Island, Indonesia). *Journal of Applied Geospatial Information*, 1(2), 44-48.
- Pramithasari, K. (2017). Analisis Yuridis Terhadap Wanprestasi Perjanjian Jual Beli Tanah Di Kota Batam (Studi Kasus Nomor: 26/Pdt. G/2011/PN. BTM). *PETITA*, 3(2), 174-213.
- Prasetya, N. A., & Sunaryo, P. (2013). *Faktor-Faktor Yang Mempengaruhi Harga Lahan di Kawasan Banjarsari Kelurahan Tembalang, Semarang* (Doctoral Dissertation, Universitas Diponegoro).
- Rusdi, M. (2013). Faktor-Faktor yang Mempengaruhi Harga dan Penggunaan Lahan di Sekitar Jalan Lingkar Salatiga. *Jurnal Pembangunan Wilayah dan Kota*, 9(3), 317-329.
- Setiawan, N. (2007). Penentuan Ukuran Sampel Memakai Rumus Slovin dan Tabel Krejcie-Morgan: Telaah Konsep dan Aplikasinya. *Abstrak*.
- Taki, H. M., & Lubis, M. Z. (2017). Modeling accessibility of community facilities using GIS: case study of Depok City, Indonesia. *Journal of Applied Geospatial Information*, 1(2), 36-43.