

**LAMPIRAN**

**KUESIONER PENELITIAN**

**PENGGUNAAN PROSES HIERARKI ANALISIS (AHP)**

**IDENTITAS PAKAR**

Tanggal Pengisian :

Nama Responden :

Pekerjaan Responden :

Jabatan/Instansi :

Tanda Tangan :

**KEGIATAN**

**MODEL SPASIAL DINAMIS LAHAN PERMUKIMAN KAWASAN RAWAN BENCANA  
TSUNAMI, KECAMATAN CARITA, PROVINSI BANTEN**



**PUSAT RISET GEOSPASIAL  
ORGANISASI RISET KEBUMIHAN DAN MARITIM  
BADAN RISET DAN INOVASI NASIONAL  
2022**

Kepada Yth,  
Bapak/Ibu  
Di Tempat

Terkait dengan penelitian dan kajian yang sedang kami lakukan dengan judul “Model Spasial Dinamis Lahan Permukiman Kawasan Rawan Bencana Tsunami, Kecamatan Carita, Provinsi Banten”, Kami bermaksud menyampaikan permohonan kepada Bapak/Ibu untuk menjadi pakar dalam penelitian dan kajian ini dengan memberikan judgement atas struktur hirarki yang telah disusun berdasarkan hasil studi pustaka dan kondisi empiris di lapangan.

Pengkajian dan penelitian ini bertujuan untuk memberikan prediksi prediksi luas lahan permukiman dengan model spasial, pola dan arah perkembangan lahan permukiman di Kecamatan Carita selama 20 tahun mendatang. Kajian dan Penelitian ini memiliki kekuatan pada konsistensi judgement dari Bapak/Ibu berikan pada hirarki yang ada. Penelitian ini diharapkan dapat memberikan masukan kepada pemerintah setempat untuk pembangunan di daerah.

Atas kesediaan Bapak/Ibu dalam meluangkan waktu dan mengisi kuesioner ini guna mendukung kajian dan penelitian yang kami lakukan, kami ucapkan terima kasih yang sebesar-besarnya.

## PETUNJUK PENGISIAN

1. Isi kolom identitas yang terdapat pada halaman depan kuisisioner
2. Penilaian dilakukan dengan mengisi titik-titik pada kolom yang telah tersedia.
3. Skala Penilaian adalah sebagai berikut :

Intensitas Pentingnya	Definisi
1	Kedua elemen sama pentingnya
3	Elemen yang satu sedikit lebih penting ketimbang yang lain
5	Elemen yang satu esensial atau sangat penting ketimbang yang lainnya
7	Satu elemen jelas lebih penting dari elemen lainnya
9	Satu elemen mutlak lebih penting ketimbang elemen lainnya
2,4,6,8	Nilai-nilai antara dua pertimbangan yang berdekatan

### Cara pengisian :

Kriteria pada kolom paling kiri dibandingkan dengan kriteria pada kolom paling kanan. Bobot 9 s/d 2 (pada bagian kiri) adalah milik kriteria pada kolom paling kiri, sedangkan bobot 9 s/d 2 (pada bagian kanan) adalah milik kriteria pada kolom paling kanan. Beri tanda silang (x) pada kolom bobot yang sesuai berdasarkan nilai ketergantungan yang telah dijelaskan pada tabel diatas.

contoh :

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Aksesibilitas							x											Infrastruktur
															x			Permukiman

keterangan : Artinya aksesibilitas sedikit lebih penting daripada infrastruktur.  
Sedangkan permukiman jelas lebih penting daripada aksesibilitas.

### Definisi setiap kriteria

No	Kriteria	Faktor
1	Fisik	Geologi (Jenis Batuan)
		Topografi
		Sumber air/sungai (cekungan air tanah)
		Jenis Tanah
		RTH (Ruang Terbuka Hijau)
		Kemiringan Lereng
2	Aksesibilitas	Jalan Kolektor
		Jalan Lokal
		Jalan Lingkungan
3	Bahaya ( <i>hazard</i> )	Bahaya Banjir
		Bahaya Tsunami
		Bahaya Gempa Bumi
4	Sarana dan Prasarana	Fasilitas Umum dan Sosial
5	Ketertagaan	Permukiman

#### Keterangan:

- Geologi (jenis batuan) = Informasi mengenai batuan yang membentuk permukaan tanah. Contohnya batuan sedimen, batuan metamorf, dan lainnya.
- Topografi = bentuk permukaan bumi seperti bukit, lembah, dan lainnya.
- RTH (Ruang Terbuka Hijau) = *Green Open Space* atau Ruang Terbuka Hijau (RTH) adalah area atau jalur dalam kota/wilayah yang penggunaannya bersifat terbuka dan biasanya tanpa bangunan.
- Jenis Tanah = Biasanya suatu wilayah memiliki jenis tanah yang berbeda dari wilayah Indonesia lainnya. Contohnya tanah gambut, tanah endapan sungai, tanah pasir, dan lainnya.
- Kemiringan Lereng = Kemiringan lereng yang umumnya dinyatakan dalam persen (%)

Pemilihan faktor/Kriteria yang Paling mempengaruhi permukiman di Kecamatan Carita, Provinsi

Banten

1. Geologi (Jenis Batuan)

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Geologi (Jenis Batuan)																		Topografi
																		Sumber air/sungai (cekungan air tanah)
																		Jenis Tanah
																		RTH
																		Kemiringan Lereng
																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																	Permukiman	

2. Topografi

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Topografi																		Sumber air/sungai (cekungan air tanah)
																		Jenis Tanah
																		RTH
																		Kemiringan Lereng
																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 3. Sumber air/sungai (cekungan air tanah)

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Sumber air/sungai (cekungan air tanah)																		Jenis Tanah
																		RTH
																		Kemiringan Lereng
																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																	Permukiman	

### 4. Jenis Tanah

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Jenis Tanah																		RTH
																		Kemiringan Lereng
																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 5. RTH

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
RTH																		Kemiringan Lereng
																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
																		Permukiman

### 6. Kemiringan Lereng

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Kemiringan Lereng																		Jalan Kolektor
																		Jalan Lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 7. Jalan Kolektor

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Jalan Kolektor																		jalan lokal
																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 8. Jalan Lokal

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Jalan Lokal																		Jalan Lingkungan
																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman



### 9. Jalan Lingkungan

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Jalan Lingkungan																		Bahaya Banjir
																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 10. Bahaya Banjir

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Bahaya Banjir																		Bahaya Tsunami
																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 11. Bahaya Tsunami

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Bahaya Tsunami																		Bahaya Gempa Bumi
																		Fasilitas Umum dan Sosial
																		Permukiman

### 12. Bahaya Gempa Bumi

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Bahaya Gempa Bumi																		Fasilitas Umum dan Sosial
																		Permukiman

### 13. Fasilitas Umum dan Sosial

Kriteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Kriteria
Fasilitas Umum dan Sosial																		Permukiman

Presentasi di GeoICON (Geomatics International Conference), 30 Juni 2022

**DYNAMIC SPATIAL MODEL OF SETTLEMENT LAND IN TSUNAMI-PRONE AREAS, CARITA DISTRICT, BANTEN**

**R Anfansyah<sup>1</sup>, A Mutiara<sup>2</sup>, S Arfah<sup>3</sup>, M N Putri<sup>3</sup>, H Sanjaya<sup>3</sup>, and Y Anantasena<sup>3</sup>**

<sup>1</sup> Urban and Regional Planning Department, Faculty Of Engineering, Brawijaya University, Malang 65145, Indonesia  
<sup>2</sup> Urban and Regional Planning Department, Faculty Of Engineering, Esa Unggul University, Jakarta 11510, Indonesia  
<sup>3</sup> Geospatial Research Center, Geotech Building 2nd Floor, PUSPIITEK Serpong area, South Tangerang 15314, Indonesia

BRIN  
Esa Unggul

Zoom Meeting | You are viewing Panitia\_Cheriea Alfarella P.T.'s screen | View Options | 00:28:28 | View | Recording | Participants: 33 | Chat | Share Screen | Record | Reactions | Apps | Leave | 10:31 AM 7/26/2022

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# INTRODUCTION

Banten Province in 1883 was affected by a fairly powerful tsunami, this was due to the eruption of Mount Krakatau. The tsunami disaster caused damage to coastal areas in Serang Regency and even the impact of the disaster was felt to the coasts of East and South Asia which caused hundreds thousands of casualties (Zahro, 2019).

December 22, 2018 a tsunami occurs in 2 (two) provinces. one of the province that affected by tsunami is Banten Province (Serang Regency and Pandeglang Regency) Land cover affected by the tsunami in Carita District is plantations (24.11 Ha), rice fields (2.70 Ha), buildings (4.91 Ha) (Alimsuardi et al., 2019)



Source : Rasyid Ridho, 2018

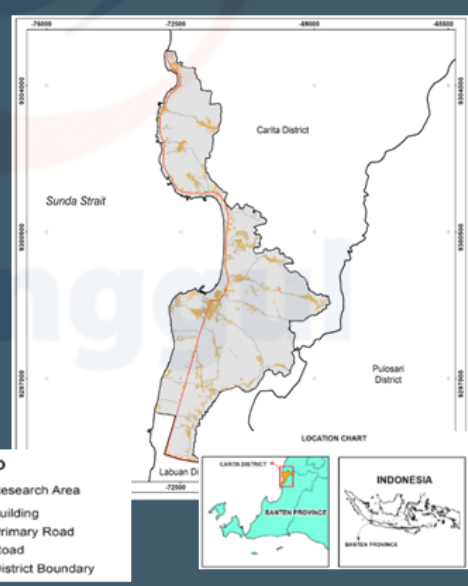


Source : Liputan6.com, 2018

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# METHODS

Carita District is located in Pandeglang Regency, Banten Province which consist of 10 villages and 3,655 Ha total area. The Detailed Spatial Plan (RDTR) of Carita district used is the output for 2022-2042 with the deliniation area covering 7 vilages with 1,563 Ha total area. The research was conducted in the coastal area of carita district with a total of 7 vilages (Figure 1). The research was carried out for 4 months.



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## LAND USE ANALYSIS

This analysis aims to identify land use that will be input in land use modeling. In this study, the land use data used is data taken in 2017, which has been corrected by the latest satellite imagery. Land use in Carita District is divided into 6, with the classification used for modeling are **settlements, social and public facilities, water bodies, agriculture, plantation, and protected area**

## ANALYTICAL HIERARCHY PROCESS

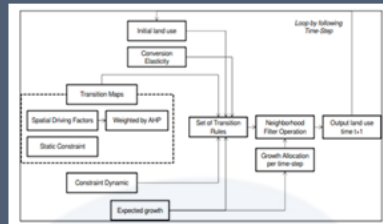
AHP is a concept for **multicriteria-based** decision making (multiple criteria). Some criteria that are compared to one another (their importance) is the main emphasis on the concept of AHP (Utama, 2017).



## METHODS

## BUILT A MODEL OF LAND USE CHANGE

Land use modeling simulation using modeling with cellular automata technique. **Landusesim** is an application used based on Cellular automata so that it can manage starting from driving-factor, **neighbourhood** process, transition-rules, zoning and the amount of simulation used (Nursakti, Adh Pratomatmolo, 2014).

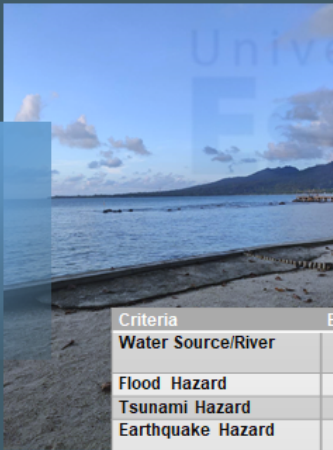


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# 03

## RESULTS AND DISCUSSION

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## Determine The Criteria That Most Affect Tsunami-prone Settlements

The next stage is to determine the criteria that most affect the settlements of tsunami-prone areas using AHP analysis.

Criteria	Eigen	Local Weight	AHP Value
Water Source/River	1.145968016	0.081854858	8.16
Flood Hazard	1.142077646	0.081576975	8.16
Tsunami Hazard	1.177678007	0.084119858	8.45
Earthquake Hazard	1.17181696	0.083701211	8.52
Public & Social Facilities	1.53881132	0.109915094	11.02
Settlement	2.194190136	0.156727867	15.6

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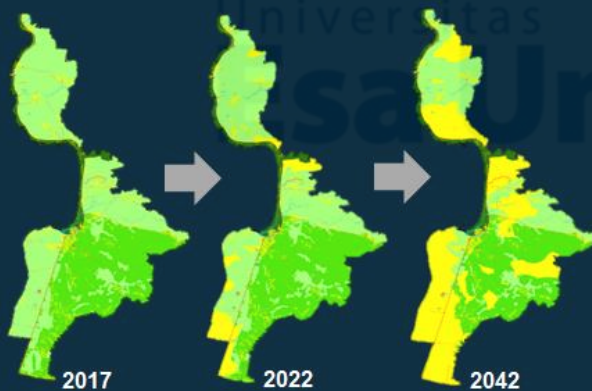
## Land Use Simulation of Carita District

Simulations for Carita District were carried out after the completion of the AHP analysis. There needs to be a transition rule to find out how the simulation of land use change works. LanduseSim is an application used in land use modeling of transitional districts. Before conducting land use simulations on LanduSesim, prepare data in advance on GIS such as transition maps for each driving factor

In conducting this research, researchers made several decisions to facilitate the course of simulation, calculation and data processing. This research will determine how the interaction patterns between land uses will be modelled. In the pattern of interaction or Land constraints, it is known that land use has the highest and lowest hierarchy, the highest hierarchy means that the land has the potential to expand while the lowest hierarchy indicates that the land can be changed for land use.

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## Land Use in Carita District 2017 - 2042



The results of the comparative analysis show that between land use in 2017 and 2042 there is a fairly high settlement development of **697%** which has an **expansion in the southern and northern Carita District areas**.

LEGEND	
	Road
	District Boundary
	Settlement Area
	Social and Public Facilities
	Water Bodies
	Agriculture
	Plantation
	Protected Area

No.	Landuse	Years			Change (%)
		2017	2022	2042	
1	Settlement Area	86.38	205.73	688.65	697%
2	Social and Public Facilities	15.81	12.48	12.48	-21%
3	Water Bodies	7.079	6.59	6.59	-7%
4	Agriculture	844.71	736.52	380.72	-55%
5	Plantation	544.23	536.61	409.48	-25%
6	Protected Area	65.45	65.73	65.73	1%

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## CONCLUSION

Based on the analysis of land use changes that have been carried out above, it is known that the **settlement sector has a significant role in the growth of Carita District**. The proximity of settlements to coastal area, river bodies and public facilities is the main variable in this study but is not necessarily the main factor. **The results of the simulations that have been carried out can be input for the Carita District government in the direction of land use development, especially in residential areas located in coastal areas and river bodies.** Several things that need to be considered in further research are more detailed land use so that the results obtained are more detailed as a consideration of the driving factors in development.

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THANK YOU FOR  
YOUR ATTENTION  
ANY QUESTION??

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