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Spatial Modeling of Land Suitability of Various Industries in East Serang Region Based on the Spatial Plan of Serang Regency of 2011-2031

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Abstract

Industrial land suitability is a land assessment to be developed as an industrial area. Eastern Serang Regency is projected as a various industrial area following the Regional Regulation Number 5 of 2020. In examining potential lands to be developed as a various industrial area, a spatial modeling of land suitability is required. The parameters employed in this study were ten, comprising land use, slope, landslide, soil type, flood, erosion, drainage, water availability, waste disposal, and foundation stability. The study method was descriptive with a quantitative approach. The analysis technique was overlay and scoring techniques. The study aimed to 1) understand the location with an appropriate land area for a various industrial area and 2) calculate the land area potential to be developed as a various industrial area based on the spatial plan of Serang Regency. The study results are 1) the location with the biggest area based on the S2 land suitability class (appropriate) was Tunjungjeta District and 2) the overall area of land potential to be developed as a various industrial area based on the spatial plan of Serang Regency was 13661,36 Ha.

Keywords:
industrial land suitability, industrial development, land potencial, spatial plan

Introduction

Economic development is currently facing a massive challenge, both in local and international markets. Local economic development is a process encompassing alternative industrial construction, labor capacity improvement, social income improvement via GDP (Gross Domestic Product) increase, followed by economic structural change based on business fields or sectoral division (Arsyad, 2010; Subandi, 2014; Faried & Sembiring, 2019). It causes the government to issue several policies to foster economic growth in various sectors. The industrial sector was one of the sectors

becoming the pioneer to improve economy. Therefore, current regional development focuses more on the industrial sector. Industrial development is a method to repair imbalance economic structure. Developing countries, particularly Indonesia, is in the transition phase from the agricultural to industrial sector. In the current era, the industrial sector has an appeal in the eyes of society. Industrial sector development is based on the high unemployment rate and the minimum wage. The industrial sector accelerates employment, and hence, is expected to improve social income. Industrial sector development affects the land area required in the development. In densely populated big cities, areas for industrial development are limited. Thus, it is necessary to find an appropriate area location to develop industries.

Serang Regency is one of the vast regions in Banten Province. According to the Regional Regulation of Serang Regency Number 5 of 2020 article 3 paragraph 1, spatial planning policy of Serang Regency will be projected to develop processing industries based on local commodities that are sustainable and globally competitive. The economic structure of Serang Regency is illustrated via the value distribution of each sector's GRDP. The higher the GRDP percentage of a sector, the bigger the sector effect on the region's economic growth. GRDP of Serang Regency at the Current Price by Business Field of 2020 shows that the industrial sector remains providing the highest contribution to local economy, i.e., 35,282.53 billion Rupiah. Based on the Regional Regulation of Serang Regency article 43 paragraph 3, industrial areas based on its activity type are dividied into four: metal, various, minapolitan (fishery), and priority industrial areas. The current study focused on the various industrial area in East Serang Regendy. Areas in the East Serang region rapidly grow, primarily in the various labor-intensive industries since its location is adjacent to Greater Tangerang. The presence of this industrial area is expected to boost the local revenue value and labor absorption. In encouraging area development in the industrial field, land suitability and development analyses are required to understand the potential of area planned as the industrial development location. Industrial development is the 9th Sustainable Development Goals, i.e., Industry, Innovation, and Infrastructure. Based on this background, this study formulated problems of 1) how to determine the location with an appropriate land area following land suitability of various industries and 2) what is the potential land area to be developed following the spatial plan of Serang Regency. The study aimed to 1) understand the location with an appropriate land area for a various

industrial area and 2) calculate the land area potential to be developed as a various industrial area based on the spatial plan of Serang Regency.

Literature Review

Industry

Industry definition in the President Regulation Number 24 of 209 is an economic activity processing raw materials or semi-finished goods to finished goods with a higher value.An industrial area means an area dominated by industrial activities with various facilities including plant equipment, development laboratories, social and shared facilities, and other supporting infrastructure (Urban Land Institute, 1975; Hutomo, 2013). An industrial area, according to the Presidential Decree of the Republic of Indonesia Number 53 of 1989, is a processing industrial area equipped with facilities and infrastructure managed by an industrial company. The company is a legal entity following Indonesian legal regulations and is located in Indonesia (Iswanto, 2019).

According to the Regulation of the Ministry of Industry Number 35 of 2010, an industrial area has impacts as follow:

1) Facilitate businesses to obtain an industrial area ready to build equipped with infrastructure.

2) Provide a legal certainty for businesses.

3) Control spatial problems and environmental adverse effects from the industrial activities.

Geographic Information System

The Geographic Information System is a computer-based system to input, manage, manipulate, analyze, and generate data with geographic references. The output of geographic information system can be used as decision-making. In a sustainable development, geographic information system has a pivotal role to plan and control. SIG can map the area resource potential and predict disaster prone areas as a capital in developing areas.

Land Suitability

Land is a natural resource with an essential role in human life. Land is the area of the earth's surface that has properties derived from the biosphere vertically including atmosphere, geology, geomorphology, hydrology, and affects land use in the past and future. Another land definition is a part of landscape including

physical environments, i.e., climate, topography/relief, soil, hydrology, and vegetation (FAO, 1976; Rayes, 2007, Seridity etc, 2016).

Land suitability is the assessment of a land suitability level for a particular use matched with the land suitability level based on the classification from parameter scoring. This industrial land suitability is utilized to assess a land for industrial areas. Parameters employed in industrial land suitability are physical parameters, i.e., land use, soil type, slope, drainage, avalanche, flood, erosion, water availability, foundation stability, and waste disposal.

Method

1. The study used a quantitative approach to review industrial land suitability per the Spatial Plan of Serang Regency of 2011 - 2031 and Regional Regulation of Serang Regency Number 5 of 2020.
2. Data Collection Technique

   The data collection technique used was documentation study. Documentation study is inventory of secondary data used in the study from related institutions.
3. Data Analysis Technique

   Data analysis techniques in this study comprise two:

   a. Overlay

      Overlay is an overlapping technique using a Geographic Information System to combine several parameters in the same area to acquire latest information per analysis objectives. The study carried out two overlays, i.e., 1) an overlay to determine the industrial land suitability and 2) an overlay of industrial land suitability with the industrial are in the Spatial Plan of Serang Regency of 2011-2031.

   b. Scoring

   Scoring aims to give the value of each parameter referring to previous studies and modification. The scoring criteria of each parameter in this study are:

1. Slope

Table 1 Slope Score

Class	Slope (%)	Classification	Score
I	0 – 8	Flat	5
II	8 - 15	Sloping	4
III	15 -25	Relatively Steep	3
IV	25 -45	Steep	2
V	> 45	Highly Steep	1

Source: Seridity, 2016

2. Land Use

Table 2. Land Use Score

Class	Land Use	Classification	Score
I	Shrubs, Gardens, Rainfed Rice Fields, Moor, Settlements, Buildings	Highly Suitable	2
II	Irrigated Rice Fields, Forest, Grass, Rocky Ground	Relatively Suitable	1
III	Seawater, Freshwater, Waters	Unsuitable	0

Source: Nugraha, 2015

3. Soil Type

Table 3. Soil Type Score

Class	Soil Type	Classification	Score
I	Alluvial, Gleiplanosol, Gray Hydromorph, Lateria	Highly Suitable	4
II	Latosol	Suitable	3
III	Brown Forest Soil, Non-Calcic Brown, Mediterranean	Relatively Suitable	2
IV	Andosol, Laterite, Grumusol, Podsol, Podsolik	Less Suitable	1
V	Regosol, Litosol, Organosol, Renzina	Unsuitable	0

Source: Nugraha, 2015

4. Flood

Table 4. Flood Score

Class	Flood	Classification	Score
I	No Flood	Suitable	3
II	Susceptible to Flood	Relatively Suitable	2
III	Prone to Flood	Unsuitable	1

Source: Sanjoto, 1996, Imanuson, 2008, and Modification

5. Erosion

Table 5. Erosion Score

Class	Erosion	Classification	Score
I	No Erosion	Suitable	3
II	Less Erosion	Relatively Suitable	2
III	Adequate Erosion	Unsuitable	1

Source: Sanjoto, 1996, Imanuson, 2008, and Modification

6. Drainage

Table 6. Drainage Score

Class	Drainage	Classification	Score
I	High Drainage	Suitable	3
II	Adequate Drainage	Relatively Suitable	2
III	Low Drainage	Unsuitable	1

Source: Sanjoto, 1996, Imanuson, 2008, and Modification

7. Foundation Stability

Table 7 Foundation Stability Score

Class	Foundation Stability	Classification	Score
I	High	Highly Suitable	5
II	Moderate	Suitable	4
III	Adequate	Relatively Suitable	3
IV	Low	Less Suitable	2

V	Very Low	Unsuitable	1

Source: Sanjoto, 1996, Imanuson, 2008, and Modification

8. Water Availability

Table 8 Water Availability Score

Class	Water Availability	Classification	Score
I	High	Highly Suitable	5
II	Moderate	Suitable	4
III	Adequate	Relatively Suitable	3
IV	Low	Less Suitable	2
V	Very Low	Unsuitable	1

Source: Regulation Of The Minister Of Public Works No.20/PRT/M/2007 and Modification

9. Waste Disposal

Table 9 Waste Disposal Score

Class	Waste Disposal	Classification	Score
I	High Waste Disposal	Highly Suitable	5
II	Moderate Waste Disposal	Suitable	4
III	Adequate Waste Disposal	Relatively Suitable	3
IV	Low Waste Disposal	Less Suitable	2
V	Very Low Waste Disposal	Unsuitable	1

Source: Regulation Of The Minister Of Public Works No.20/PRT/M/2007 and Modification

10. Landslide

Table 10 Landslide Score

Class	Avalanche	Classification	Score
I	No Landslide	Highly Suitable	5
II	Very Low	Suitable	4

III	Low	Relatively Suitable	3
IV	Moderate	Less Suitable	2
V	High	Unsuitable	1

Source: Sanjoto, 1996, Imanuson, 2008, and Modification

Result

The study location was in East Serang areas, covering Bandung, Binuang, Carenang, Cikande, Ciruas, Jawilan, Kopo, Kragilan, Lebakwangi, Pamarayan, and Tunjungteja. These locations are planned to be the various industrial area by the Serang Regency Government. It is issued in the Regional Regulation Number 5 of 2020. Such locations are strategic due to its proximity to Greater Tangerang, allowing many citizens to agglomerate to East Serang. In observing the land suitability to construct industrial plants in East Serang areas, industrial land suitability analysis was performed. The industrial land suitability analysis used ten parameters, i.e., land use, slope, avalanche, soil type, flood, erosion, drainage, water availability, waste disposal, and foundation stability.

Analysis of Each Parameter

Slope

This various industrial area is recommended to be on 0-8% slope or a flat region. A flat region facilitates the building construction, not requiring special treatments. Also, the building maintenance is easier than sloping, wavy, or steep regions. The slope parameter analysis in this location generated results presented in Table 11.

Table 11. Slope Area of the Various Industrial Area in East Serang

District	Area (Ha)		Total Area (Ha)
	Highly Suitable (S1)	Suitable (S2)	
	0 - 8%	8 - 15%	
Bandung	2525,47		2525,47
Binuang	2936,16		2936,16
Carenang	2833,16		2833,16
Cikande	4854,27		4854,27
Ciruas	3528,61		3528,61
Jawilan	4420,87		4420,87
Kibin	2995,38		2995,38

Kopo	3782,06		3782,06
Kragilan	3761,77		3761,77
Lebakwangi	3440,64		3440,64
Pamarayan	4537,12		4537,12
Tunjungteja	4208,37	86,04	4294,41

Source: Data Processing, 2021

The results of slope data processing show that the various industry location of Serang Regency is in 0-8% slope, except for Tunjungjeta District. Tunjungjeta District is in between 0-8% and 8-15%. From this data, the study location is suitable to be planned as a various industrial area. The slope distribution in spatial is presented in Figure 1. Slope Map of Various Industrial Location of East Serang.

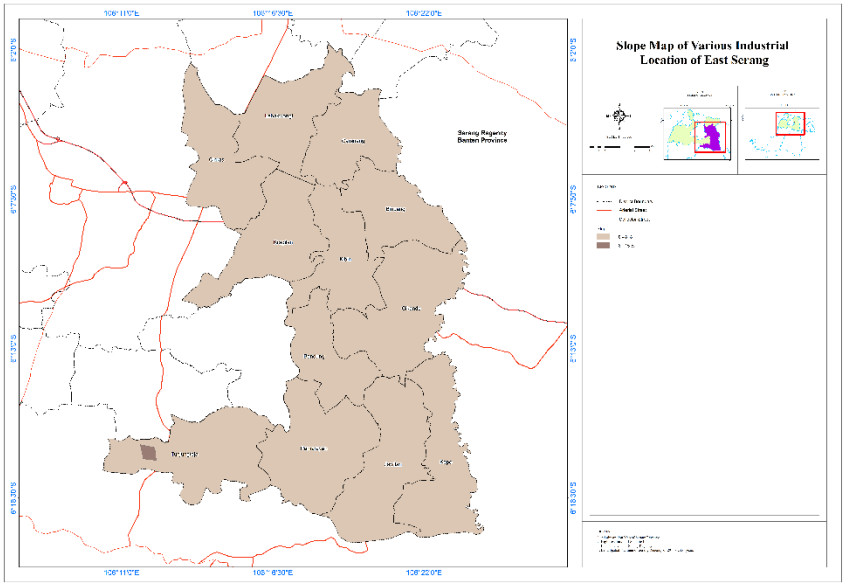

Figure 1. Slope Map of Various Industrial Location of East Serang

Land Use

Land use is utilized to determine the various industrial location since existing land use can be transitioned to industrial development. Not all land use can be transitioned into industrial areas, such as land use in protected areas. The appropriate land uses to be built as an industrial area are vacant land, mixed gardens, shrubs, and rice fields. It is

because land use without closed areas are easily converted than protected areas with vegetations preserved by the government. Land use based on the Class S2 (suitable) criteria for various industrial areas has an area of approximately 37653.8 Ha, while Class S3 (relatively suitable) is 5567.15 Ha, and unsuitable land area is 687.37 Ha. The biggest land area classified into the suitable land use criteria for various industrial areas is in Cikande District, while the smallest is in Tunjungteja District. The biggest land area classified into the relatively suitable land use is in Tunjungteja District, while the smallest is in Ciruas District. The biggest land area classified into the unsuitable land use is in Kibin District, while the smallest is in Jawilan District. Land use of various industrial areas of Serang Regency is presented in Table 12.1; Table 12.2, Table 12.3 and Figure 2. Land Use Map of the Various Industrial Location of East Serang.

Table 12. 1. Suitable Land Use Area of the Various Industrial Location of East Serang

District	Suitable/ S2 (Area Ha)						Total Area (Ha)
	Industrial Area	Residential Area	Rice Field	Shrub	Farm	Moor	
Bandung	0,18	211,38	1387,75	867,63	0	0	2466,94
Binuang	9,95	208,78	2090,6	493,74	0	0	2803,07
Carenang	0	201,59	2154,7	390,19	9,58	0	2756,06
Cikande	334,56	634,38	2169,57	1639,61	0	0	4778,12
Ciruas	54,59	542,2	2446,91	452,59	0,18	17,44	3513,91
Jawilan	230,57	498,89	2036,49	288,59	0,05	64,19	3118,78
Kibin	366,28	271,86	1113,7	1082,9	4,21	0	2838,95
Kopo	57,18	397,89	1870,57	319,33	18,8	0	2663,77
Kragilan	364,72	569,89	1694,56	999,87	5,08	10,8	3644,92
Lebakwangi	2,35	261,37	2789,66	297,59	0,97	0	3351,94
Pamarayan	27,97	519,12	2623,27	177,84	7,06	11,75	3367,01
Tunjungteja	1,95	354,64	1848,79	128,94	16,03	0	2350,35

Source: Data Processing, 2021

Table 12.2 Relatively Suitable Land Use Area of the Various Industrial Location of East Serang

District	Relatively Suitable/ S3 (Area Ha)			Total Area (Ha)
	Plantation	Forest	Mine	
Bandung	3,21	0	0	3,21
Binuang	1,45	55,67	0	57,12
Carenang	7,3	0	0	7,3
Cikande	15,54	0	0	15,54
Ciruas	1,39	0	0	1,39
Jawilan	1273,83	0	18,67	1292,5
Kibin	19,17	29,71	0	48,88
Kopo	1062,16	0	0	1062,16
Kragilan	49,36	0	0	49,36
Lebakwangi	8,2	0	0	8,2
Pamarayan	1110,15	0	4,68	1114,83
Tunjungteja	1567,85	338,82	0	1906,67

Source: Data Processing, 2021

Table 12.3 Unsuitable Land Use Area of the Various Industrial Location of East Serang

District	Unsuitable/N2 (Area Ha)				Total Area (Ha)
	Dyke	Pond	Situ	River	
Bandung	0	0	33,45	21,86	55,31
Binuang	0	0	60,53	15,23	75,76
Carenang	0	0	10,44	59,33	69,77
Cikande	0	0,1	36,53	23,49	60,12
Ciruas	0,32	0	0	12,96	13,28
Jawilan	0	2,45	0,26	6,89	9,6
Kibin	0	0	52,03	55,53	107,56
Kopo	0	0	3	52,49	55,49
Kragilan	0	0,04	24,53	42,76	67,33
Lebakwangi	0	0	2,04	78,46	80,5
Pamarayan	0	0	0	55,26	55,26
Tunjungteja	0,83	0	0	36,56	37,39

Source: Data Processing, 2021

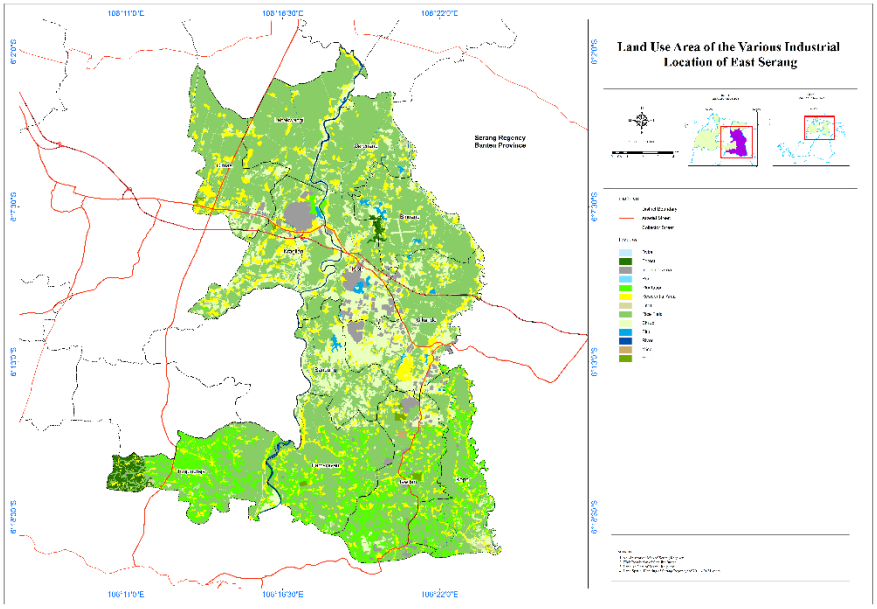

Figure 2. Land Use Map of the Various Industrial Location of East Serang

Soil Type

Soil type has a vital role in determining various industrial land suitability. Soil type affects the possible disasters. Therefore, recognition of soil type of each land facilitates disaster handling. Also, soil type determines the foundation type and industrial building structure to be built. The soil type data processing results obtained four soil types in the study location. Soil types classified into the highly suitable class are alluvial, glei, and latosol. Soil types classified into the less suitable class was podzolic. The biggest land area classified into the highly suitable class is in Binuang District by 2935.95 Ha, while the smallest is in Jawilan District by 1.15 Ha. The biggest land area classified into the less suitable class is in Jawilan District, while the smallest is in Binuang District. A more detailed picture is presented in Table 13 and Figure 3. Soil Type Map of the Various Industrial Location of East Serang.

Table 13 Soil Type Area of the Various Industrial Location of East Serang

District	Area (Ha)			
	Highly Suitable (S1)			Less Suitable (N1)
	Alluvial	Glei	Latosol	Podzolic
Bandung	1197,39			1328,08
Binuang	330,46	2605,49		
Carenang	1271,78	1557,6		3,77
Cikande	515,97	1155,19		3183,05
Ciruas	233,49	2203,04		1092,08
Jawilan	1,15			4419,72
Kibin	1655,13	1211,43		128,81
Kopo	1172,39			2609,62
Kragilan	477,77	48,22		3235,78
Lebakwangi	1422,78	1144,98		872,88
Pamarayan	1656,12			2880,99
Tunjungteja	379,3		1789,47	2125,64
Total Area (Ha)	10313,75	9925,95	1789,47	21880,43

Source: Data Processing, 2021

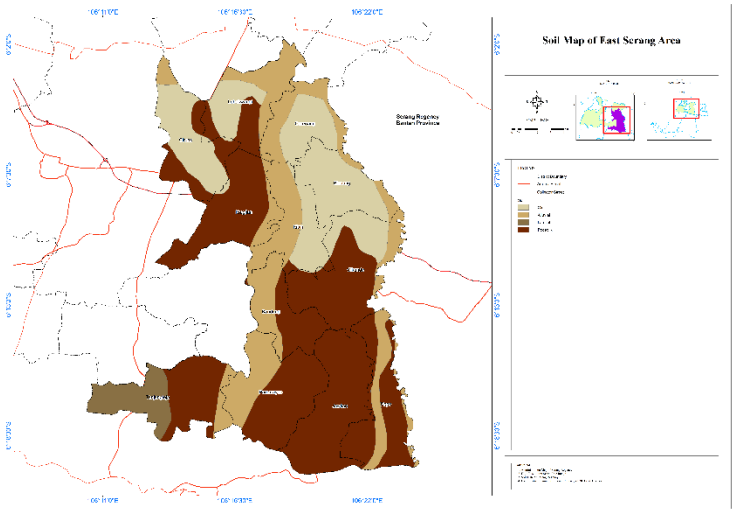

Figure 3. Soil Type Map of the Various Industrial Location of East Serang

Flood

Flood is an inhibitor in running industrial activities. Therefore, a various industrial location should not be in an area susceptible to flood. Flood also deteriorates building quality. Flood in this study was divided into three classifications, i.e., susceptible to flood, prone to flood, and no flood. Examination on flood potential of areas is presented in Table 14 and Figure 4. Flood Map of the Various Industrial Location of East Serang.

Table 14 Flood Area of the Various Industrial Location of East Serang

District	Area (Ha)		
	Suitable (S2)	Relatively Suitable (S3)	Unsuitable (N2)
	No Flood	Susceptible to Flood	Prone to Flood
Bandung	198,34	1417,64	909,5
Binuang	25,45	2910,71	
Carenang	9,45	2531,45	292,27
Cikande	125,49	4701,91	26,87
Ciruas	47,51	3086,71	394,39
Jawilan	418,1	3954,71	48,07
Kibin	7,56	1641,62	1346,2
Kopo	336,41	3445,65	
Kragilan	120,22	3125,68	515,88
Lebakwangi		1351,09	2089,54
Pamarayan	322,68	1565,36	2649,07
Tunjungteja	1113,66	1983,65	1197,12
Total Area (Ha)	2724,87	31716,18	9468,91

Source: Data Processing, 2021

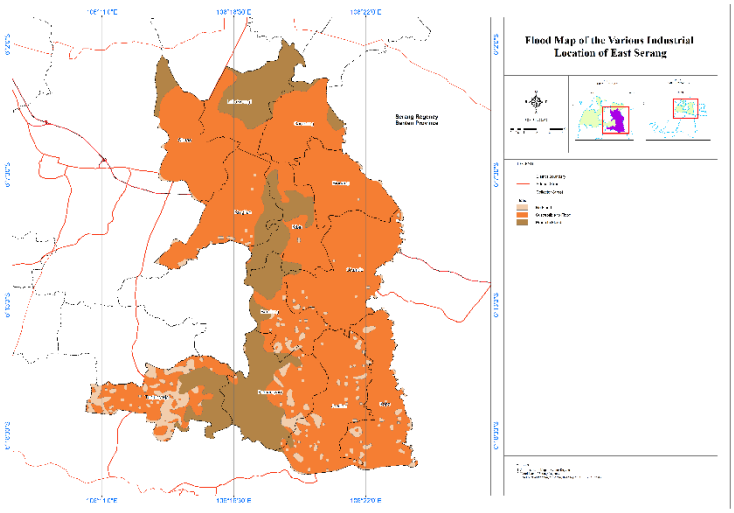

Figure 4. Flood Map of the Various Industrial Location of East Serang

Erosion

Soil erosion illustrates the soil condition. Soil with high erosion indicates that soil layers easily peel off and carried away by other media (wind and water). Low erosion is a condition where soil layers hardly carried away by wind and water, while no erosion is a soil condition without layer peeling. Based on the data processing results, two erosion classifications exist, i.e., S3 (relatively suitable) or less erosion and N2 (unsuitable) or adequate erosion. The biggest land area classified into the less erosion classification is in Jawilan District, while the smallest is in Carenang District. The biggest land area classified into the adequate erosion classification is in Binuang District, while the smallest is in Jawilan District. Erosion condition of each district is illustrated in Table 15 and Figure 5. Erosion Map of the Various Industrial Location of East Serang.

Table 15 Erosion Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Relatively Suitable (S3)	Unsuitable (N2)
	Less Erosion	Adequate Erosion
Bandung	1328,08	1197,39
Binuang		2935,95
Carenang	3,77	2829,39
Cikande	3183,05	1671,16
Ciruas	1092,08	2436,53
Jawilan	4419,72	1,15
Kibin	128,81	2866,57
Kopo	2609,8	1172,22
Kragilan	3235,78	525,99
Lebakwangi	872,88	2567,76
Pamarayan	2880,99	1656,12
Tunjungteja	2211,68	2082,73
Total Area (Ha)	21966,64	21942,96

Source: Data Processing, 2021

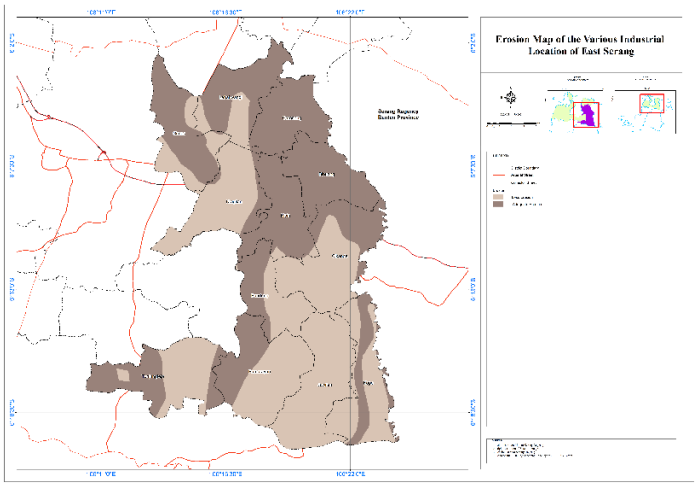

Figure 5. Erosion Map of the Various Industrial Location of East Serang.

Drainage

The drainage parameter was used to measure water flow speed. If the water flow speed is high, then drainage is high. Meanwhile, if the flow is slow, the drainage is low. Low drainage causes puddles in an area. Drainage for the various industrial location is presented in Table 16 and Figure 6. Drainage Map of the Various Industrial Location of East Serang.

Table 16 Drainage Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Suitable (S2)	Relatively Suitable (S3)
	High	Adequate
Bandung	2525,47	
Binuang	2935,95	
Carenang	2833,16	
Cikande	4854,21	
Ciruas	3528,61	
Jawilan	4420,87	
Kibin	2995,38	
Kopo	3782,01	
Kragilan	3761,77	
Lebakwangi	3440,64	
Pamarayan	4537,12	
Tunjungteja	4208,37	86,04
Total Area (Ha)	43823,56	86,04

Source: Data Processing, 2021

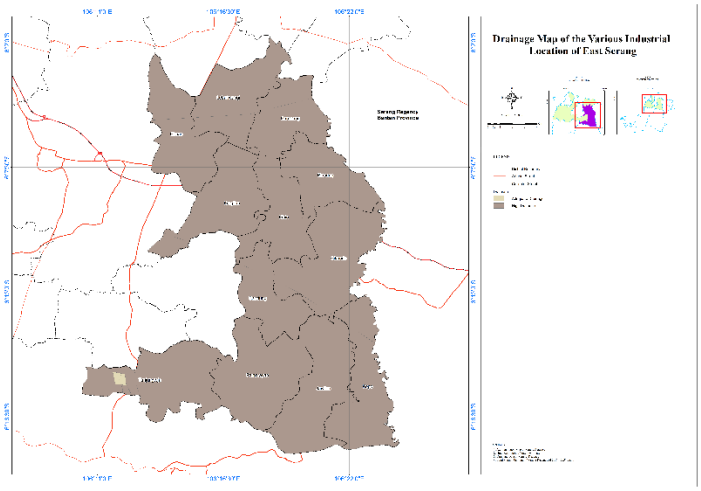

Figure 6. Drainage Map of the Various Industrial Location of East Serang.

Foundation Stability

The foundation stability parameter was employed to assess the eligibility of building construction in an area. The higher the foundation stability score, the more eligible the

area to build various buildings. Meanwhile, a low foundation stability score means that the area is unstable. Low foundation stability requires certain types of buildings resembling chicken claws. Foundation stability in the various industrial location is presented in Table 17 and Figure 7. Foundation Stability Map of the Various Industrial Location of East Serang.

Table 17 Foundation Stability Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Highly Suitable (S1)	Relatively Suitable (S3)
	High	Adequate
Bandung	1197,39	1328,08
Binuang	330,46	2605,49
Carenang	1271,78	1561,38
Cikande	515,96	4338,25
Ciruas	233,49	3295,12
Jawilan	1,15	4419,72
Kibin	1655,13	1340,24
Kopo	1172,23	2609,78
Kragilan	477,77	3284
Lebakwangi	1422,78	2017,86
Pamarayan	1656,12	2880,99
Tunjungteja	2082,73	2211,68
Total Area (Ha)	12016,99	31892,59

Source: Data Processing, 2021

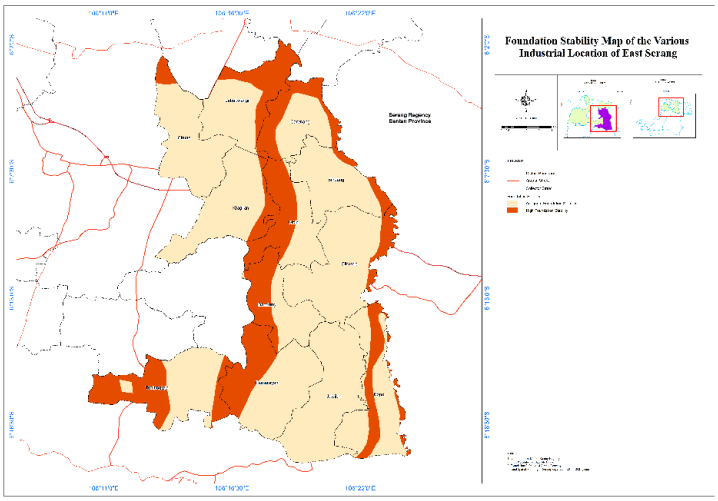

Figure 7. Foundation Stability Map of the Various Industrial Location of East Serang

Water Availability

Water availability was measured using several parameters including morphology, slope, and land use. If the water availability is high, the availability of deep and shallow groundwater is large. Moderate water availability means that shallow groundwater is insufficient. The water availability area of the various industrial location is presented in Table 18 and Figure 8. Water Availability Map of the Various Industrial Location of East Serang.

Table 18 Water Availability Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Highly Suitable (S1)	Suitable (S2)
	High	Moderate
Bandung	2525,47	
Binuang	2936,16	
Carenang	2833,16	
Cikande	4854,27	
Ciruas	3528,61	
Jawilan	4420,87	
Kibin	2995,38	
Kopo	3782,06	
Kragilan	3761,77	
Lebakwangi	3440,64	
Pamarayan	4537,12	
Tunjungteja	4208,37	86,04
Total (Ha)	43823,88	86,04

Source: Data Processing, 2021

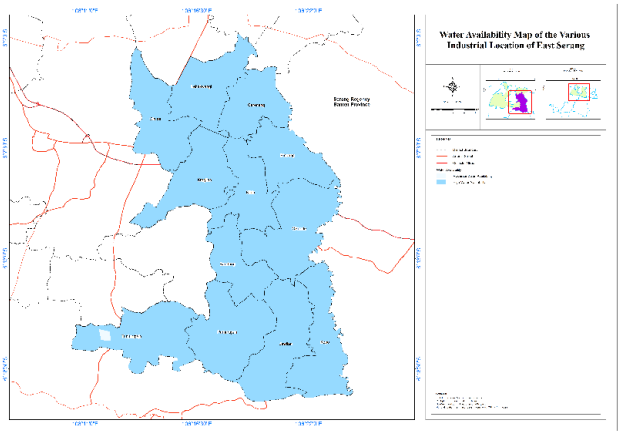

Figure 8. Water Availability Map of the Various Industrial Location of East Serang

Waste Disposal

Waste disposal is a parameter to assess the area level as a waste disposal location. Waste disposal considers hydrological and climatological conditions of an area. If the waste disposal condition is poor, such an area is unsupportive for waste disposal. Waste disposal in the various industrial location is presented in Table 19 and Figure 9. Waste Disposal Map of the Various Industrial Location of East Serang.

Table 19 Waste Disposal Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Highly Suitable/S1	Suitable/S2
	Moderate Waste Disposal	Adequate Waste Disposal
Bandung	2525,47	
Binuang	2935,94	
Carenang	2833,13	
Cikande	4853,77	
Ciruas	3528,59	
Jawilan	4420,87	
Kibin	2995,38	
Kopo	3781,41	
Kragilan	3761,76	
Lebakwangi	3440,64	
Pamarayan	4537,11	
Tunjungteja	4216,95	77,37
Total Area (Ha)	43831,02	77,37

Source: Data Processing, 2021

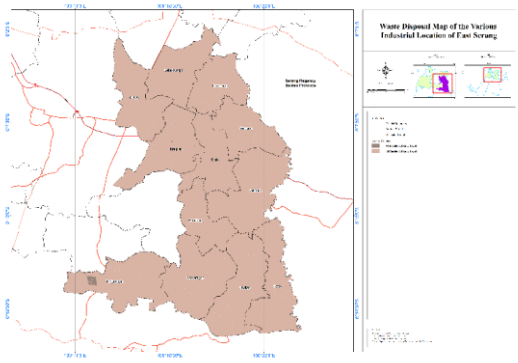

Figure 9. Waste Disposal Map of the Various Industrial Location of East Serang

Landslide

Landslide is a consideration to build a building and develop an area. This landslide assessment aims to minimize landslide potential and control development in avalanche-prone areas; hence, does not harm private investors. Landslide in the various industrial location is presented in Table 20 and Figure 10. Landslide Map of the Various Industrial Location of East Serang.

Table 20 Landslide Area of the Various Industrial Location of East Serang

District	Area (Ha)	
	Suitable (S2)	Relatively Suitable (S3)
	Very Low	Low
Bandung	2265,74	259,73
Binuang	2936,16	
Carenang	2833,16	
Cikande	4854,27	
Ciruas	3528,61	
Jawilan	600,4	3820,47
Kibin	2995,38	
Kopo	2096,63	1685,43
Kragilan	3761,77	
Lebakwangi	3440,64	
Pamarayan	2205,38	2331,74
Tunjungteja	4129,02	165,39
Total Area (Ha)		

Source: Data Processing, 2021

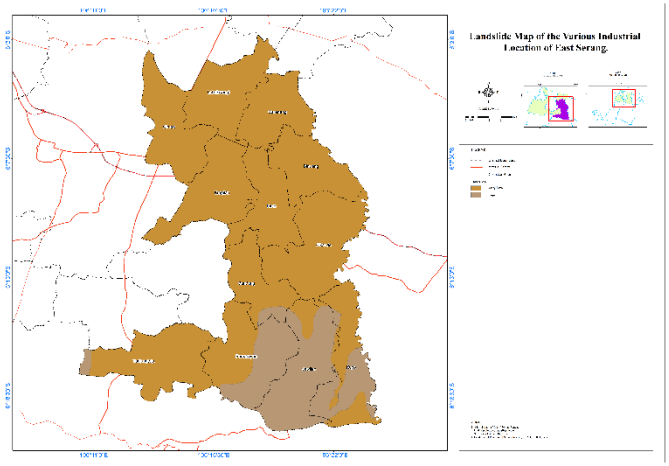

Figure 10. Landslide Map of the Various Industrial Location of East Serang

Spatial Modeling of Various Industrial Land Suitability

The results of spatial modeling of various industrial land suitability using ten parameters explained in point A reveal that the planned location is suitable with the Regional Regulation Number 5 of 2020 and Spatial Plan of Serang Regency of 2011-2031, dominated by the Class S2 (suitable) of land suitability with an area of 11177,94 Ha. The Class S2 (suitable) area is 29603,93 Ha and Class N2 (unsuitable) area is 3126,54. Based on Table 21, the biggest land area in Class S2 (suitable) is in Tunjungteja District by 1955, 82 Ha, while the smallest is in Jawilan District. The biggest land area in in Class S3 (relatively suitable) is in Cikande District, while the smallest is in Bandung District. The biggest land area in Class N2 (unsuitable) is in Pamarayan District, while the smallest is in Carenang District. Land suitability of the various industrial location is presented in Table 21 and Figure 11. Land Suitability Map of the Various Industrial Location of East Serang.

Table 21 Land Suitability Area of the Various Industrial Location of East Serang

District	Area (Ha)		
	Suitable (S2)	Relatively Suitable (S3)	Unsuitable (N2)
Bandung	1172,96	1303,25	49,26
Binuang	326,79	2609,16	
Carenang	1228,77	1602,14	2,21
Cikande	504,53	4325,62	23,61
Ciruas	235,1	3288,78	4,7

Jawilan	1,11	3351,68	1068,08
Kibin	1588,9	1405,89	0,58
Kopo	1047,86	2284,79	448,76
Kragilan	441,55	3289,73	30,48
Lebakwangi	1344,94	2089,77	5,93
Pamarayan	1329,61	2001,26	1206,24
Tunjungteja	1955,82	2051,85	286,68
Total Area (Ha)	11177,94	29603,92	3126,53

Source: Data Processing, 2021

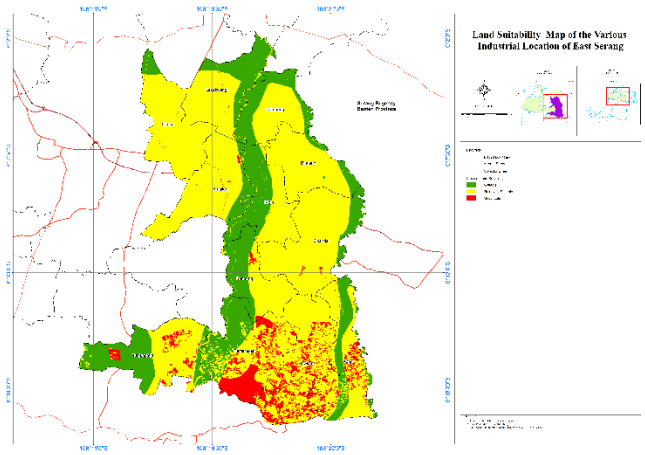

Figure 11. Land Suitability Map of the Various Industrial Location of East Serang

Spatial Modeling of Potential Land to Develop the Various Industrial Area of East Serang

The potential land analysis in this study aimed to discover potential areas to be developed as a various industrial area in Serang Regency. The data processing result classified was overlayed with the spatial plan of Serang Regency. The selection of suitable class and relatively suitable were due to the absence of inhibiting factors in industrial development. Data processing results show that Kibin District has the biggest land area to be developed as a suitable various industrial area, while the smallest is Pamarayan District. Total area of potential land was 13661,36 Ha. The total area were from total area of suitable class and relatively suitable class.Area distribution of data processing results is presented in Table 22 and Figure 12. Potential Land Map of the Various Industrial Location Following the Spatial Plan of Serang Regency.

Table 22 Potential Land Area of the Various Industrial Location Following the Spatial Plan of Serang Regency

District	Area (Ha)		
	Suitable (S2)	Relatively Suitable (S3)	Unsuitable (N2)
Bandung	344,19	1043,69	32,39
Binuang	120,10	1608,99	
Cikande	83,83	3236,34	0,99
Ciruas		335,36	
Jawilan		1965,13	402,60
Kibin	550,29	1144,99	0,57
Kopo	334,64	819,90	185,26
Kragilan	43,46	558,85	12,06
Lebakwangi	21,82	4,44	
Pamarayan	0,01	42,49	10,31
Tunjungteja	543,70	859,15	142,14
Total Area (Ha)	2042,03	11619,33	786,32

Source: Data Processing, 2021

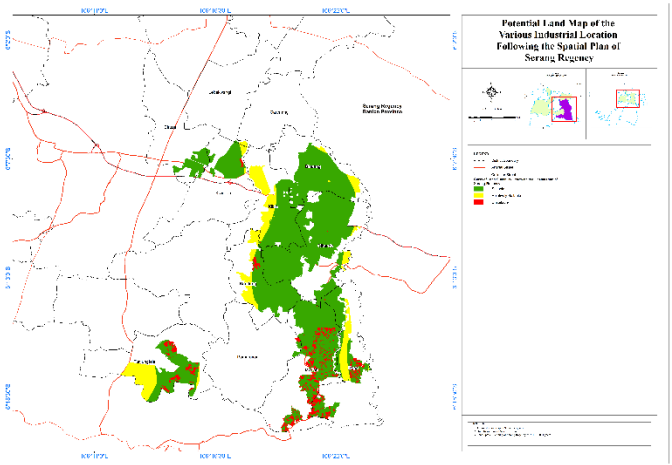

Figure 12. Potential Land Map of the Various Industrial Location Following the Spatial Plan of Serang Regency

Conclusion

Land suitability modeling for various industries in East Serang acquired three classes, i.e., S2 (suitable), S3 (relatively suitable), and N2 (unsuitable). The biggest land area based on Class S2 (suitable) is in Tunjungteja District. The overall potential land area to be developed as a various industrial area following the spatial plan of Serang Regency is 13661,36 Ha.

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