

Analysis of Land Availability and Land use Directions in the East Development Area of Bogor District

Hanang Dewantoro¹, Janthy Trilusianthy Hidayat², Lilis Sri Mulyawati³

Universitas Pakuan, Bogor¹²³

Email: hanangdewanto@gmail.com¹, janthyhidayat@unpak.ac.id²,

lilissrimulyawati@unpak.ac.id³

Abstract

This paper investigates the suitability and availability of land for development in the Eastern Development Region (WP Timur) of Bogor Regency, West Java. As part of the Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur (Jabodetabekpunjur) National Strategic Area, WP Timur plays a crucial role in urban development, environmental conservation, and agricultural expansion. This study utilizes Geographic Information System (GIS) tools and Analytic Hierarchy Process (AHP) combined with Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to assess land use suitability and resolve land availability issues. The research identifies that a significant portion of WP Timur's current land use comprises rainfed paddy fields, irrigated rice fields, and productive mixed gardens. These are essential for local agriculture but must align with the Regional Spatial Plan (RTRW) of Bogor Regency to support sustainable urbanization and industrial development. Analysis reveals challenges related to land conflicts and legal disputes, highlighting the need for clear land tenure and effective management strategies. By evaluating existing land use against the RTRW guidelines, the study identifies suitable and unsuitable areas for various land uses, emphasizing the importance of integrated spatial planning for balanced development. The findings provide valuable insights for policymakers and urban planners to optimize land utilization, enhance regional competitiveness, attract investments, and improve local community welfare in WP Timur.

Keywords: land suitability, land availability, GIS, AHP, SWOT analysis, regional spatial planning.

INTRODUCTION

Bogor Regency is part of the Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur National Strategic Area (KSN Jabodetabekpunjur), in accordance with Presidential Regulation No. 54 of 2008, later amended by Presidential Regulation No. 60 of 2020 on the Spatial Planning of Jabodetabekpunjur Urban Area (Kemensesneg, 2008; Kemensesneg, 2020). Bogor Regency plays a vital role as a buffer for the capital city of DKI Jakarta, especially in urban settlement development, environmental conservation due to its geographical position in the upstream water management area, and agricultural development, particularly horticulture (Pemda Kabupaten Bogor, 2016).

The Spatial Planning (RTRW) of Bogor Regency, outlined in Regional Regulation No. 11 of 2016, divides its territory into three Development Areas (WP): WP West, WP Central, and WP East. This division aims to accelerate development, enhance community welfare, improve public services, and increase regional competitiveness (Pemda Kabupaten Bogor, 2016). In this context, WP East is identified as a prospective new

autonomous region (CDOB) that requires in-depth studies on land use suitability and availability for various development needs. The phenomenon of New Autonomous Region (DOB) development in Indonesia has highlighted various challenges and opportunities, including the urgent need to improve the quality of public services and community welfare in these new regions. However, territorial expansion often faces issues of adequate land availability, suboptimal infrastructure, and potential conflicts of interest among various stakeholders (Gallaso, Tan, & Yang, 2019).

WP East of Bogor Regency, consisting of seven sub-districts: Gunung Putri, Cileungsi, Klapanunggal, Jonggol, Cariu, Sukamakmur, and Tanjungsari, is in the process of becoming East Bogor CDOB. This expansion proposal has received approval from the Regent, the Bogor Regency DPRD, and the Governor and DPRD of West Java Province, and has been submitted to the President of Indonesia through Letter No. 2288/KK.04.02.02/PEMOTDA dated April 27, 2021 (Fathoni, Mansyur, & Djakapermana, 2023). The development of East Bogor CDOB requires adequate infrastructure and land for offices and investments. Land availability is crucial, given the increasing land demand due to development, while the availability remains limited as land area relatively never increases (Kumalatin, Pakasi, & Waney, 2022). Land use in WP East Bogor Regency needs to be evaluated to ensure compliance with the established Spatial Pattern Plan. The availability of clean and clear land, free from disputes, conflicts, and land issues, is also a key focus in developing WP East. Analysis using AHP and SWOT methods is needed to evaluate infrastructure criteria, socio-economic aspects, legal, and land issues in formulating optimal land use directions in WP East Bogor Regency (Nurhabib et al., 2024). Thus, this regional development is expected to proceed according to spatial plans, enhance competitiveness, attract investment, and provide maximum benefits to the local community. Based on the above explanation, the researcher conducts an Analysis of Land Suitability and Availability for development in WP East Bogor Regency. This study aims to analyze the suitability of existing land use with the directions of the Spatial Pattern Plan of Bogor Regency for 2016-2036 in the East Development Area of Bogor Regency. Additionally, this study aims to analyze land availability based on the potential for disputes, conflicts, and land issues in the East Development Area of Bogor Regency. Ultimately, this research seeks to formulate optimal land use directions in WP East Bogor Regency.

RESEARCH METHOD

Location and Time of Research

The research was conducted in the Eastern Development Area of Bogor Regency, West Java Province, which includes seven sub-districts: Gunung Putri, Cileungsi, Klapanunggal, Jonggol, Cariu, Sukamakmur, and Tanjungsari. This location was chosen because these seven sub-districts are part of the East Bogor CDOB area. The map of the research location is presented in Figure 1. Administratively, the Eastern Development Area of Bogor Regency consists of seven sub-districts and 75 villages, out of a total of 40 sub-districts and 435 villages/urban villages in Bogor Regency, covering an area of 775.39 km² (77,539 ha), or approximately 26% of the total area of Bogor Regency, which is 2,986.20 km². This research was conducted over 11 months, from June 2023 to May 2024.

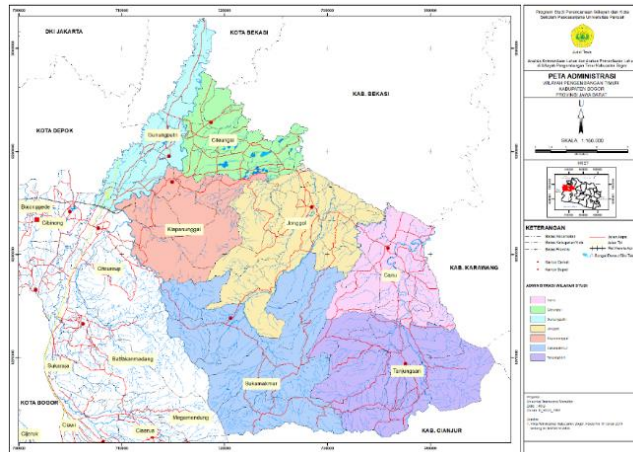


Figure 1. Research Location Map.

Materials and Tools

The primary materials used in this research include the 2022 land use map of Bogor Regency, the Bogor Regency RTRW Map, the General Land Ownership Map, and the Dispute Distribution Map. The tools used for data processing include ArcGIS software and Microsoft Office.

Data Collection Methods

The data used in this research mainly consists of secondary data, such as the 2022 land use map of Bogor Regency, the Bogor Regency RTRW Map, the General Land Ownership Map, and spatial distribution data on disputes, conflicts, and land issues obtained from the Bogor Regency Land Office II. Supporting data or literature for this research, such as legislation, journals, and books, were collected online using search engines and internet assistance (Sugiyono, 2017).

Data Analysis Techniques

Table 1. Matrix of research objectives, data types, methods, variables, and results

No	Puprose	Type of Data	Data Source	Data Analysis Technique	Results
1	Analyzing the suitability of existing land use with the directives of the Bogor Regency Spatial Plan for 2016-2036 in the Eastern Development Area of Bogor Regency;	<ul style="list-style-type: none"> Bogor Regency Land Use Map for 2013 and 2022 Bogor Regency Spatial Plan Map (RTRW) 	<ul style="list-style-type: none"> Secondary Data from the Land Office of Bogor Regency II 	<ul style="list-style-type: none"> Quantitative and spatial analysis (using GIS) 	<ul style="list-style-type: none"> Land Use Suitability Map
2	Analyzing land availability based on the potential for disputes, conflicts, and land issues in the Eastern Development Area of Bogor Regency;	<ul style="list-style-type: none"> Land Use Suitability Map (result of analysis 1) General Overview of Land Ownership Map Spatial Distribution of Land Disputes, Conflicts, and Issues Forest Area Map 	<ul style="list-style-type: none"> Map and results of analysis objective 1 Secondary Data from the Land Office of Bogor Regency II 	<ul style="list-style-type: none"> Quantitative and spatial analysis (using GIS). 	<ul style="list-style-type: none"> Land Availability Map

No	Puprose	Type of Data	Data Source	Data Analysis Technique	Results
3	Developing land use directives in the Eastern Development Area of Bogor Regency.	<ul style="list-style-type: none"> Land Availability Map (Result of analysis 2) Population, number and types of service facilities, accessibility, and general overview of the area (physical, social, and economic) of Bogor Regency in 2022. AHP SWOT Questionnaire Strength, Weakness, Opportunity, Threat factors Data from in-depth interviews 	<ul style="list-style-type: none"> Map and results of analysis objectives 1 and 2 AHP-SWOT Questionnaire 	<ul style="list-style-type: none"> AHP-SWOT Analysis Descriptive Analysis 	Land Use Directives in the Eastern Development Area of Bogor Regency

Analysis Methods

Land use suitability analysis uses overlay analysis between existing land use maps and the Bogor Regency RTRW Spatial Pattern Map. The first step is to create a matrix of land use suitability with spatial pattern directives in the Regional Spatial Plan (RTRW), with the following classification levels of suitability:

1. Suitable: if the existing land use aligns with the spatial pattern directives in the RTRW document and map.
2. Not Suitable: if the existing land use does not align with the spatial pattern directives in the RTRW document and map.

Table 2. Land Use and RTRW Spatial Pattern Alignment

No	Spatial Plan (RTRW)	Existing Land Use
1.	Forest Area Enclave	Natural Bush Forest, Dense Forest, Mixed Gardens Already in Production, Rainfed Rice Fields, Shrubs, River, Dry Fields.
2.	Limited Production Forest Area	Permanent Establishments, Natural Bush Forest, Dense Forest, Land Clearing, Open Mining, Shrubs, River.
3.	Permanent Production Forest Area	Natural Bush Forest, Dense Forest, Land Clearing, Open Mining, Swamp, Shrubs, River, Dry Fields.
4.	Industrial Designated Area	Permanent Establishments, Various Food Industries, Chemical Industries, Other Industries, Toll Roads, Dense Villages, Mixed Gardens Already in Production, Land Clearing, Open Mining.
5.	Wetland Designated Area	Swamp, Rainfed Rice Fields, River, Dry Fields.
6.	Dryland Designated Area	Land Clearing, Non-Technical Irrigated Rice Fields, Technical Irrigated Rice Fields, Rainfed Rice Fields, River.
7.	Plantation and Perennial Crop Designated Area	Mixed Gardens Already in Production, Large Plantations Already in Production, Open Mining, River, Dry Fields.
8.	Rural Settlement Designated Area	Permanent Establishments, Sparse Villages, Dense Villages, Mixed Gardens Already in Production, Land Clearing, Dense Housing, Rainfed Rice Fields, Shrubs, River, Dry Fields.

No	Spatial Plan (RTRW)		Existing Land Use
9.	Permukiman Kepadatan Rendah	Perkotaan	Lake, Permanent Establishments, Sparse Villages, Dense Villages, Mixed Gardens Already in Production, Pond, Land Clearing, Sparse Housing, Dense Housing, Technical Irrigated Rice Fields, Rainfed Rice Fields, River, Dry Fields.
10.	Permukiman Kepadatan Sedang	Perkotaan	Lake, Permanent Establishments, Sparse Villages, Dense Villages, Mixed Gardens Already in Production, Pond, Land Clearing, Sparse Housing, Dense Housing, Technical Irrigated Rice Fields, Rainfed Rice Fields, River, Dry Fields.
11.	Permukiman Kepadatan Tinggi	Perkotaan	Lake, Permanent Establishments, Other Industries, Toll Roads, Sparse Villages, Dense Villages, Mixed Gardens Already in Production, Pond, Sports Field, Golf Course, Sparse Housing, Dense Housing, Technical Irrigated Rice Fields, Rainfed Rice Fields, Shrubs, Reservoir, River, Dry Fields.
11.	Rencana Waduk		Mixed Gardens Already in Production, Large Plantations Already in Production, Rainfed Rice Fields, Dry Fields.
12.	Situ		Lake, Reservoir, River.

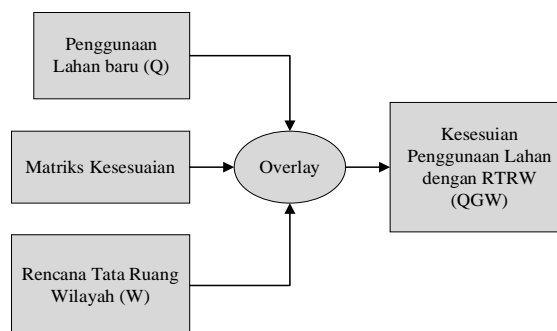


Figure 2. Land Use Suitability Analysis Against RTRW

Land availability analysis is conducted to obtain information on lands available for cultivation/development/investment activities, considering RTRW spatial pattern plans, land use, and general land ownership. Land availability is categorized into: available and unavailable.

The first step is to create criteria as shown in Table 3.

Table 3. Land Availability Criteria

Ketersediaan tanah	Klasifikasi
Tersedia	a) tanah-tanah yang bukan kawasan Hutan, b) kesesuaian penggunaan lahan terhadap RTRW tidak sesuai, dan c) GUPT nya berupa Tanah wakaf Badan hukum dan perorangan, tanah belum terdaftar Badan Hukum dan Perorangan, Tanah Komunal, dan/atau tanah negara dikuasai negara.
Tidak Tersedia	a) tanah-tanah yang merupakan kawasan Hutan, b) kesesuaian penggunaan lahan terhadap RTRW nya sesuai,

c) GUPT nya bukan berupa Tanah wakaf Badan hukum dan perorangan, tanah belum terdaftar Badan Hukum dan Perorangan, Tanah Komunal, dan/atau tanah negara dikuasai negara.

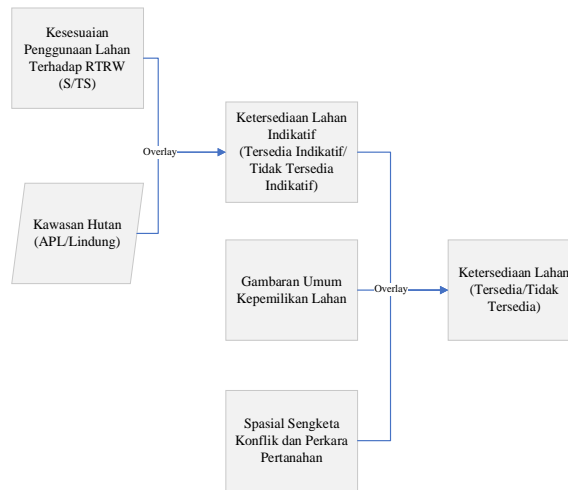


Figure 3. Land Availability Analysis

Land use directive analysis is performed using the AHP SWOT method from the analysis results and SWOT questionnaires, utilizing Analytical Hierarchy Process and SWOT (A'WOT). AHP is used for complex decision-making processes, involving various criteria such as prioritizing between several policy alternatives and objectives. AHP is conducted through several stages (Saaty, 2008; Russo and Camanho, 2015):

1. Define the problem and knowledge sources.
2. Construct the decision hierarchy from the goal to the lowest level (alternatives).
3. Construct a pairwise comparison matrix.
4. Use the priorities from the comparisons to derive the weights for each criterion.

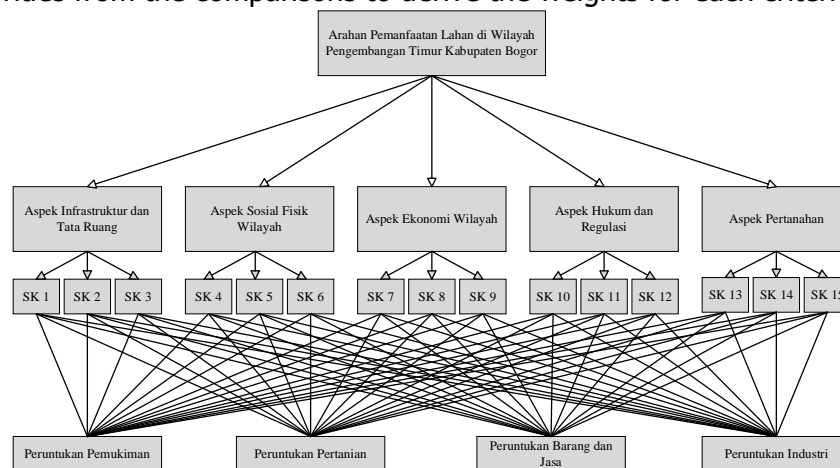


Figure 4. AHP for Land Use Directives

Strategy Development Process with SWOT Method

The first stage (input analysis) collects and classifies data into internal and external data affecting development in WP East Bogor Regency. The second stage (matching analysis) gathers information influencing the preparation for establishing the

East Bogor New Autonomous Region (DOB). The third stage (decision analysis) formulates strategies through the SWOT Matrix.

Table 4. SWOT Strategy Matrix

Internal/Eksternal	Kekuatan (<i>Strengths</i>)	Kelemahan (<i>Weaknesses</i>)
Kelemahan (<i>Weaknesses</i>)	Strategi SO Menciptakan strategi yang menggunakan kekuatan untuk memanfaatkan peluang	Strategi WO Menciptakan strategi yang meminimalkan kelemahan untuk memanfaatkan peluang
Ancaman (<i>Threats</i>)	Strategi ST Menciptakan strategi yang menggunakan kekuatan untuk mengatasi ancaman	Strategi WT Menciptakan strategi yang meminimalkan kelemahan dan menghindari ancaman

Research Respondents

Table 5. Number of Respondents

No.	Responden	Jumlah	Keterangan
1	Unsur Akademisi	1	Dosen
2	Pejabat ATR/BPN	1	Kepala Sub Direktorat Dirjen Tata Ruang
3	Unsur Pemda	1	Koordinator Substansi Bappeda Kabupaten Bogor
4	Unsur Organisasi Masyarakat	1	Anggota DPRD Kabupaten Bogor
5	Unsur Pengusaha	1	Pengusaha

A questionnaire interview was distributed to respondents selected through purposive sampling to obtain expert opinions on the spatial planning of the Eastern Development Region of Bogor Regency as a prospective new autonomous region. The AHP analysis was conducted using Expert Choice software version 11.

RESULTS AND DISCUSSION

A. Existing Land Use

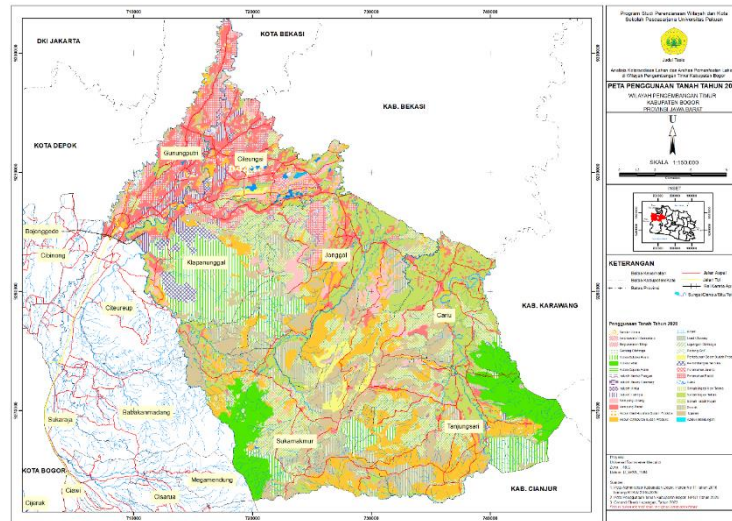


Figure 5. Land Use Map in the Eastern Development Region (WP) of Bogor Regency

The functional direction for the Eastern Development Region (WP) of Bogor Regency is to develop the eastern urban area with equal functions and roles as centers for settlement, trade and services, industry, agriculture and livestock, mining, and tourism. However, the existing land use in the Eastern Development Region (WP) of Bogor Regency is currently mostly rainfed rice fields covering an area of 11,889.51 Ha (15.33%), technical irrigation rice fields 10,200.59 Ha (13.16%), and mixed production gardens covering an area of 10,159.83 Ha (13.10%).

Table 6. Land Use in the Eastern Development Region (WP) of Bogor Regency in 2022

Penggunaan Lahan	Luas Per Kecamatan (Ha)							Jumlah
	Cariu	Cileungsi	Gunungputri	Jonggol	Klapanunggal	Sukamakmur	Tanjungsari	
Sawah Tadah Hujan	1.713,80	327,37	244,70	2.120,67	1.053,72	3.679,20	2.750,05	11.889,51
Sawah Irigasi Teknis	3.480,09	703,65	113,54	2.834,63	484,67	1.269,09	1.314,93	10.200,59
Kebun Campuran Sudah Produksi	391,67	510,07	387,50	1.558,38	639,42	3.218,73	3.454,06	10.159,83
Tegalan	824,30	364,19	377,63	943,08	465,25	4.187,82	1.709,30	8.871,58
Hutan Belukar Alami	48,02	-	-	1.153,15	3.720,57	896,19	1.424,94	7.242,88
Kampung Padat	590,42	2.020,70	2.279,58	696,24	837,98	257,64	477,70	7.160,26
Hutan Lebat	746,70	-	-	-	-	2.184,05	1.955,83	4.886,58
Semak	83,65	1,62	33,96	1.699,16	113,61	1.089,92	934,71	3.956,62
Perumahan Padat	9,96	1.068,22	1.666,99	662,76	453,47	-	-	3.861,40
Kampung Jarang	279,38	603,65	153,11	1.462,90	321,60	610,16	295,37	3.726,15
Industri Lainnya	0,63	407,31	423,66	13,21	373,73	-	39,13	1.257,67
Perkebunan Besar Sudah Produksi	34,84	124,58	-	43,58	0,19	700,26	108,68	1.012,13
Pertambangan Terbuka	9,04	-	-	-	939,85	-	6,80	955,70
Sungai	140,26	31,86	96,14	140,80	52,70	81,28	79,92	622,96
Land Clearing	54,31	16,33	42,60	131,58	27,68	19,43	-	291,94
Industri Aneka Pangan	-	125,69	59,59	18,13	48,89	-	-	252,30
Perumahan Jarang	28,05	147,10	3,19	49,33	12,96	-	-	240,62
Emplasemen Tetap	61,93	53,46	31,82	3,16	11,22	12,52	39,75	213,85
Kebun Buah-buahan Sudah Produksi	-	200,90	-	-	-	-	-	200,90
Danau	-	121,30	11,40	-	19,67	3,85	-	156,22
Industri Kimia	-	121,71	16,37	-	-	-	-	138,08

Penggunaan Lahan	Luas Per Kecamatan (Ha)							
	Cariu	Cileungsi	Gunungputri	Jonggol	Klapanunggal	Sukamakmur	Tanjungsari	Jumlah
Padang Golf	-	-	92,48	-	-	-	-	92,48
Rawa	-	19,98	16,04	-	3,83	0,91	-	40,76
Jalan Tol	-	-	33,17	-	-	-	-	33,17
Situ	-	27,82	-	-	-	-	-	27,82
Kolam	-	14,86	2,31	-	7,76	0,26	-	25,19
Sawah Irigasi Non-Teknis	-	2,82	4,26	10,98	0,59	0,10	-	18,74
Lapangan Olahraga	-	-	3,40	-	-	-	-	3,40
Jumlah	8.497,06	7.015,18	6.093,46	13.541,75	9.589,36	18.211,40	14.591,15	77.539,35

B. Spatial Planning Directions of Bogor Regency's RTRW for 2016-2036

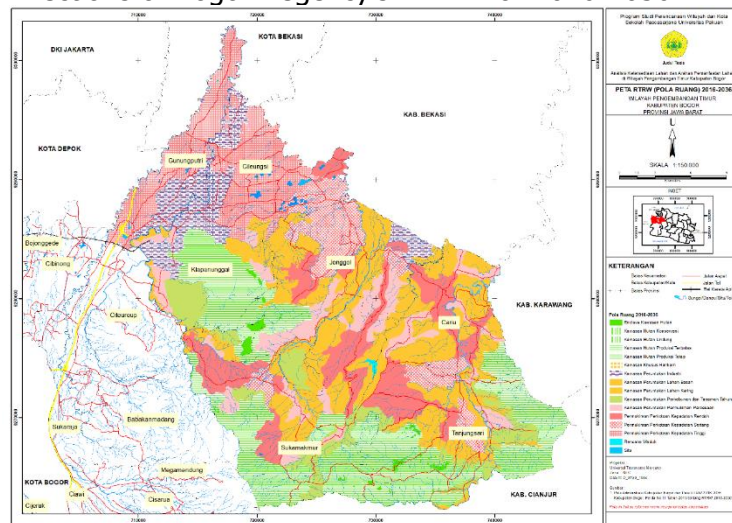


Figure 6. Spatial Planning Map for the Eastern WP of Bogor Regency

In the context of regional spatial planning, Bogor Regency has the Regional Spatial Plan (RTRW) for 2016-2036, established by Regional Regulation No. 11 of 2016. The spatial planning aims to create a high-quality, sustainable, and environmentally friendly regional spatial arrangement that focuses on tourism, settlement, industry, and agriculture activities to promote balanced and competitive regional development towards a prosperous and advanced Bogor Regency.

Table 7. Spatial Planning (Pattern) for Bogor Regency in the Eastern Development Region (WP)

Arahan Pola Ruang	Luas Per Kecamatan (Ha)							
	Cariu	Cileungsi	Gunungputri	Jonggol	Klapanunggal	Sukamakmur	Tanjungsari	Jumlah
Kawasan Hutan Produksi Terbatas	711,98	-	-	1.019,37	1.834,49	3.040,40	6.383,37	12.989,62
Kawasan Peruntukan Lahan Basah	3.338,83	-	6,38	4.196,01	1.194,05	1.215,55	1.609,09	11.559,90
Permukiman Perkotaan Kepadatan Tinggi	-	4.349,01	4.515,88	18,43	892,80	-	-	9.776,12
Permukiman Perkotaan Kepadatan Rendah	1.766,32	477,76	-	1.285,35	2,98	3.796,06	1.829,71	9.158,18
Kawasan Peruntukan Lahan Kering	1.164,80	-	-	936,32	43,98	2.657,77	1.330,11	6.132,98

Arahana Pola Ruang	Luas Per Kecamatan (Ha)							Jumlah
	Cariu	Cileungsi	Gunungputri	Jonggol	Klapanunggal	Sukamakmur	Tanjungsari	
Kawasan Peruntukan Permukiman Perdesaan	1.173,46	-	0,01	1.809,45	879,21	1.556,17	340,09	5.758,39
Kawasan Hutan Produksi Tetap	-	-	-	324,53	1.770,91	3.624,30	-	5.719,74
Kawasan Peruntukan Permukiman Perkotaan	317,97	891,77	-	2.775,23	129,54	416,37	1.159,25	5.690,13
Kawasan Peruntukan Industri	0,06	1.243,24	1.534,74	595,59	1.703,67	-	-	5.077,30
Kawasan Peruntukan Perkebunan dan Tanaman Tahunan	-	-	-	539,91	1.096,95	1.618,75	1.756,98	5.012,59
Enclave Kawasan Hutan	4,83	-	-	39,96	36,68	239,07	180,15	500,68
Situ	-	53,41	36,44	1,60	4,10	3,82	-	99,37
Rencana Waduk	18,81	-	-	-	-	43,14	2,40	64,35
Jumlah	8.497,06	7.015,18	6.093,46	13.541,75	9.589,36	18.211,40	14.591,15	77.539,35

C. Land Use Compatibility in the Eastern Development Area of Bogor Regency

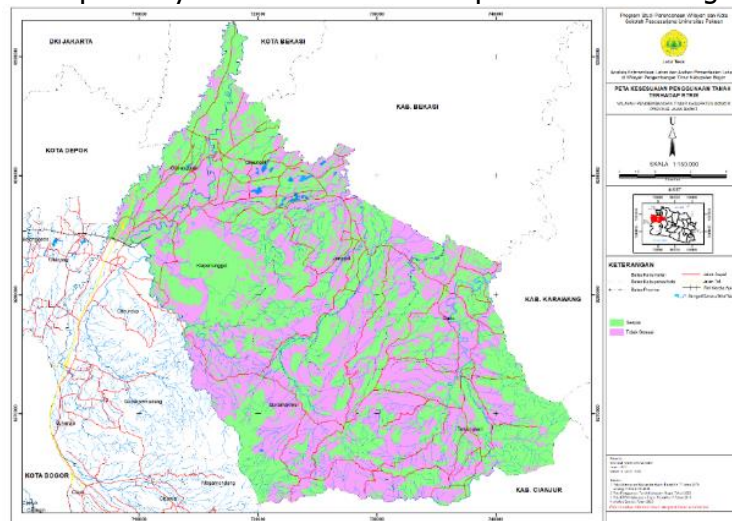


Figure 7. Land Use Compatibility Map in the Eastern Development Area of Bogor Regency

Table 8. Land Use Compatibility with Bogor Regency's RTRW in 2022

Kecamatan	Kesesuaian Lahan (Ha)				Jumlah
	Sesuai	%	Tidak Sesuai	%	
Gunungputri	4.037,68	66,26	2.055,77	33,74	6.093,46
Klapanunggal	6.163,02	64,27	3.426,34	35,73	9.589,36
Cileungsi	4.201,34	59,89	2.813,84	40,11	7.015,18
Cariu	4.885,43	57,50	3.611,63	42,50	8.497,06
Jonggol	7.446,17	54,99	6.095,58	45,01	13.541,75
Tanjungsari	7.678,56	52,62	6.912,60	47,38	14.591,15
Sukamakmur	6.823,61	37,47	11.387,78	62,53	18.211,40
Jumlah	41.235,81	53,18	36.303,54	46,82	77.539,35

The spatial plan directive in various districts within the Eastern Development Area (WP Timur) of Bogor Regency reveals significant land suitability variations. In Sukamakmur District, most land is still incompatible with the RTRW, including low-density urban residential areas and limited production forest areas requiring adjustments. Tanjungsari District shows a balance between compatible and incompatible land, focusing on limited production forest areas and dry land. Jonggol faces similar challenges, with many areas not yet suitable for urban residential and wetland purposes. In Klapanunggal, despite having much compatible land, significant areas remain incompatible, particularly in industrial and wetland sectors. Cariu shows a dominance of wetland compatible with the RTRW, although residential and plantation areas still need adjustments. Cileungsi presents a balanced land status between compatible and incompatible, emphasizing high-density urban residential and industrial areas. Lastly, Gunungputri reflects a significant need for adjustment, especially in high-density urban residential and industrial sectors. Overall, despite progress in some areas, much land in these seven districts still requires adjustments to meet RTRW requirements, with a primary focus on residential, production forest, and industrial development.

D. Land Availability in the Eastern Development Area of Bogor Regency

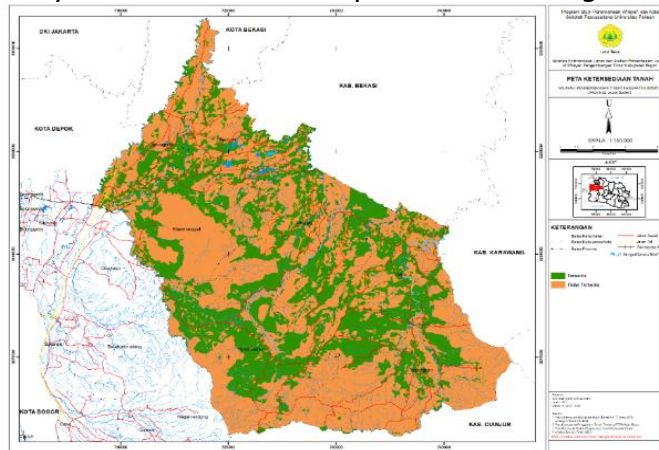


Figure 8. Land Availability Map in the Eastern Development Area of Bogor Regency

Table 9. Land Availability in the Eastern Development Area of Bogor Regency

Kecamatan	Ketersediaan Lahan (Ha)				Jumlah
	Tersedia	% Luas Tersedia	% Tidak Tersedia	Luas Tidak Tersedia	
Cariu	3.579,0	42,1	4.918,1	57,9	8.497,1
Cileungsi	2.689,3	38,3	4.325,9	61,7	7.015,2
Gunungputri	2.055,8	33,7	4.037,7	66,3	6.093,5
Jonggol	5.784,6	42,7	7.757,1	57,3	13.541,7
Klapanunggal	3.065,4	32,0	6.524,0	68,0	9.589,4
Sukamakmur	7.573,8	41,6	10.637,6	58,4	18.211,4
Tanjungsari	4.254,6	29,2	10.336,5	70,8	14.591,2
Jumlah	29.002,5	37,4	48.536,9	62,6	77.539,3

Overall, out of the total 77,539.3 hectares in the Eastern Development Area, 29,002.5 hectares (37.4%) are available for development, while 48,536.9 hectares (62.6%) are not available. Sukamakmur District has the largest proportion of available land (7,573.8 hectares), while Tanjungsari District has the largest proportion of unavailable land (10,336.5 hectares). There is also a decrease in the percentage of incompatible land from 36,303.54 hectares (46.82%) to available land of 29,002.48 hectares (37.40%), a difference of 9.42%, dominated by spatial plan directives for limited production forest areas and permanent production forest areas spread across Tanjungsari, Sukamakmur, Klapanunggal, and Jonggol districts.

E. Land Use Directives in the Eastern Development Area of Bogor Regency

Analytic Hierarchy Process (AHP)

Table 10. Priority Values for Criteria

Criteria	Value	Priority
Infrastructure and Spatial Planning Aspect	0,263	II
Physical and Social Aspects of the Region	0,104	III
Economic Aspect of the Region	0,062	IV
Legal and Regulatory Aspect	0,524	I
Land Aspect	0,047	V

According to expert preferences, legal and regulatory aspects are the top priority in determining land use directives in the Eastern Development Area of Bogor Regency, with the priority sub-criteria being the establishment of new autonomous regions by the central government. This is crucial as a basis before comprehensive planning is conducted if it becomes a new autonomous region. Infrastructure and spatial planning aspects rank second with a value of 26%, and the priority sub-criteria is the availability of basic infrastructure. The social and physical aspects rank third, with the priority sub-criteria being accessibility or the strategic geographical location of WP Timur as part of the Jabodetabekpunjur National Strategic Area (KSN). Economic aspects, with investment value sub-criteria, are important to ensure the growth of other sub-criteria. Lastly, land aspects are placed last by expert preference, with the priority sub-criteria being land availability, aligning with the basis for developing the Eastern Development Area of Bogor Regency.

Table 11. Priority Values for Sub-Criteria

Criteria	Sub Criteria	Value
Infrastructure and Spatial Planning	Availability of Basic Infrastructure	0,661
	Land Suitability with Bogor Regency's Spatial Plan (RTRW)	0,208
	Spatial Planning	0,131
Physical and Social Aspects of the Region	Population/Population Density	0,109
	Accessibility/Geographical Location	0,546
Economic Aspects of the Region	Community Participation	0,345
	GRDP (Gross Regional Domestic Product)	0,101
	Economic Growth	0,226

Criteria	Sub Criteria	Value
Legal and Regulatory Aspects	Investment Value	0,673
	Legal Foundation	0,101
	Supporting Regulations	0,226
	Establishment of New Autonomous Region (DOB) by the Central Government	0,673
Land Aspects	Land Availability	0,614
	Land Disputes	0,268
	Land Prices	0,118

Table 11 shows that the sub-criteria of basic infrastructure availability, accessibility/geographical location, establishment of new autonomous regions by the central government, and land availability are more important in determining land use directives in the Eastern Development Area of Bogor Regency. Based on the comparison between criteria and sub-criteria, land use directives in the Eastern Development Area of Bogor Regency are ranked as follows:

1. Residential Areas: Areas for residential purposes and public facilities.
2. Agricultural Areas: Areas for farming, gardening, or livestock activities.
3. Trade and Service Areas: Areas designated for trade, office activities, and warehousing;
4. Industrial Areas: Areas designated for industrial activities.

The preferences of experts, analyzed using Expert Choice 11 software, indicate that the direction for residential land use has the highest value at 40%. The allocation for agricultural development ranks second with a value of 24%. The increasing population will correspond with rising demands for housing and food needs. The ranking of land use directions in the Eastern Region of Bogor Regency is shown in Table 12.

Table 12. Ranking for land use directions in the Eastern Region of Bogor Regency.

Criteria	Value	Priority
Allocation for Residential Areas	0,407	I
Allocation for Agriculture	0,249	II
Allocation for Commerce and Services	0,219	III
Allocation for Industry	0,125	IV

Criteria	Value	Priority
Designation for Residential Areas	0,407	I
Designation for Agriculture	0,249	II
Designation for Commerce and Services	0,219	III
Designation for Industry	0,125	IV

Land availability analysis in 7 sub-districts is key to determining the suitability of each sub-district in supporting these needs. First, for residential activities, the sub-districts of Sukamakmur, Jonggol, Tanjungsari, and Cariu stand out with significant land availability. For instance, Sukamakmur has 27% of the total land availability in the

Eastern Region, with most land still available for residential development. Similarly, Jonggol, Tanjungsari, and Cariu offer similar potential with 19%, 16%, and 15% of the total land availability, respectively, which can serve as a basis for residential development considering accessibility and supporting infrastructure (Dani, Sitorus, & Munibah, 2017).

Second, for agricultural activities, Sukamakmur, Jonggol, and Tanjungsari show great potential with 30%, 24%, and 18% of the total land availability in this region. The extensive land availability in these sub-districts supports the development of agriculture as an important economic sector for the local community.

	<i>Strengths (Kekuatan)</i>	<i>Weaknesses (Kelemahan)</i>
	<ul style="list-style-type: none"> • Ketersediaan Lahan untuk Pengembangan Permukiman: Kecamatan seperti Sukamakmur, Jonggol, Tanjungsari, dan Cariu memiliki ketersediaan lahan yang signifikan untuk pengembangan permukiman. Misalnya, Sukamakmur memiliki 27%, Jonggol 19%, Tanjungsari 16%, dan Cariu 15% dari total ketersediaan lahan di WP Timur. • Potensi Besar untuk Pertanian: Sukamakmur, Jonggol, dan Tanjungsari menonjol dengan ketersediaan lahan untuk pertanian masing-masing 30%, 24%, dan 18%, mendukung sektor pertanian sebagai sumber ekonomi utama. • Ketersediaan Lahan untuk Industri: Klapanunggal memiliki 34%, Gunungputri 31%, dan Cileungsi 19% dari total ketersediaan lahan untuk pengembangan industri. Hal ini menunjukkan potensi besar untuk pengembangan sektor industri di wilayah tersebut. 	<ul style="list-style-type: none"> • Keterbatasan Infrastruktur di Beberapa Kecamatan: Beberapa kecamatan seperti Cariu dan Sukamakmur memiliki infrastruktur yang tidak memadai untuk mendukung pengembangan ekonomi. • Ketergantungan pada Sektor Tertentu: Kecamatan seperti Sukamakmur (tergantung pada pertanian) dan Klapanunggal (tergantung pada industri) cenderung bergantung pada sektor ekonomi tertentu, yang dapat menimbulkan risiko jika sektor tersebut mengalami masalah. • Tantangan Regulasi terkait Penggunaan Lahan: Kemungkinan adanya regulasi baru yang membatasi penggunaan lahan di wilayah tersebut dapat menjadi tantangan bagi pengembangan ekonomi.
<i>Opportunities (Peluang)</i>	<i>Strategi berdasarkan Strengths-Opportunities (SO):</i>	<i>Strategi berdasarkan Weaknesses-Opportunities (WO):</i>
<ul style="list-style-type: none"> • Pengembangan Pusat Perdagangan dan Jasa: Gunungputri, Cileungsi, dan Klapanunggal memiliki potensi untuk pengembangan pusat perdagangan dan jasa berdasarkan ketersediaan lahan yang strategis dan aksesibilitas yang baik. • Diversifikasi Ekonomi: Ada peluang untuk diversifikasi ekonomi di Cileungsi dan Klapanunggal dengan memperluas sektor industri dan perdagangan. 	<ul style="list-style-type: none"> • Pengembangan Infrastruktur Berkelanjutan: Memanfaatkan kekuatan ketersediaan lahan yang luas untuk pengembangan permukiman dan pertanian di kecamatan seperti Sukamakmur, Jonggol, Tanjungsari, dan Cariu (S) untuk mengambil peluang pengembangan berkelanjutan (O) di wilayah tersebut. Ini mencakup peningkatan aksesibilitas dan infrastruktur pendukung di kecamatan-kecamatan tersebut untuk mendukung pertumbuhan ekonomi lokal. 	<ul style="list-style-type: none"> • Peningkatan Infrastruktur: Mengatasi kelemahan infrastruktur (W) di Cariu dan Sukamakmur dengan memanfaatkan peluang pengembangan infrastruktur (O) di Gunungputri, Cileungsi, dan Klapanunggal. Ini meliputi peningkatan kualitas jalan, jaringan listrik, dan akses air untuk mendukung pertumbuhan ekonomi lokal.

<ul style="list-style-type: none"> • Pengembangan Infrastruktur: Peluang untuk meningkatkan infrastruktur di kecamatan seperti Gunungputri, Cileungsi, dan Klapanunggal untuk mendukung pertumbuhan ekonomi. 	<ul style="list-style-type: none"> • Diversifikasi Ekonomi: Mendorong diversifikasi ekonomi di Gunungputri, Cileungsi, dan Klapanunggal (S) dengan memanfaatkan peluang pengembangan sektor industri dan perdagangan (O). Ini termasuk mengembangkan pusat perdagangan dan jasa yang strategis di Gunungputri serta meningkatkan kapasitas industri di Cileungsi dan Klapanunggal. 	<ul style="list-style-type: none"> • Pelatihan dan Pengembangan SDM: Mengembangkan program pelatihan dan pengembangan SDM (W) untuk mendukung peluang diversifikasi ekonomi (O) di Cileungsi dan Klapanunggal. Ini termasuk pendidikan vokasi dan kursus yang mendukung kebutuhan industri dan perdagangan yang berkembang di wilayah tersebut.
<p>Threats (Ancaman)</p>	<p>Strategi berdasarkan Strengths-Threats (ST):</p>	<p>Strategi berdasarkan Weaknesses-Threats (WT):</p>
<ul style="list-style-type: none"> • Perubahan Regulasi yang Memengaruhi Pengembangan Wilayah: Ancaman dari perubahan kebijakan atau regulasi yang dapat membatasi pengembangan wilayah di Tanjungsari, Jonggol, dan Klapanunggal. 	<ul style="list-style-type: none"> • Advokasi Kebijakan: Mengadvokasi kebijakan untuk melindungi ketersediaan lahan (S) dari perubahan regulasi yang dapat mempengaruhi pengembangan wilayah di Tanjungsari, Jonggol, dan Klapanunggal (T). Ini melibatkan partisipasi aktif dalam proses regulasi untuk memastikan kondisi yang mendukung pengembangan ekonomi yang berkelanjutan. 	<ul style="list-style-type: none"> • Advokasi dan Kolaborasi: Mengadvokasi untuk mengatasi keterbatasan sumber daya (W) dan melakukan kolaborasi dengan berbagai pihak (T) untuk mengatasi tantangan regulasi dan persaingan lahan yang terbatas di Gunungputri, Cileungsi, dan Sukamakmur.
<ul style="list-style-type: none"> • Persaingan untuk Penggunaan Lahan yang Terbatas: Persaingan yang tinggi untuk penggunaan lahan yang terbatas di kecamatan seperti Gunungputri, Cileungsi, dan Sukamakmur dapat menjadi ancaman. 		
<ul style="list-style-type: none"> • Keterbatasan Sumber Daya: Keterbatasan sumber daya yang dapat mempengaruhi pengembangan infrastruktur di beberapa kecamatan seperti Cariu, Klapanunggal, dan Jonggol. 	<ul style="list-style-type: none"> • Pengembangan Mitigasi Bencana: Menerapkan strategi mitigasi bencana (S) untuk menghadapi ancaman perubahan iklim (T) di semua kecamatan. Ini termasuk mengintegrasikan rencana mitigasi bencana dalam pengembangan infrastruktur dan aktivitas ekonomi di wilayah WP Timur. 	<ul style="list-style-type: none"> • Perencanaan Kesiapsiagaan Bencana: Membangun rencana kesiapsiagaan bencana (W) untuk menghadapi ancaman perubahan iklim (T) di semua kecamatan. Ini termasuk membangun kapasitas komunitas untuk merespons bencana alam yang mungkin terjadi sebagai dampak dari perubahan iklim.

Third, the trade and service sector can be developed in sub-districts such as Gunungputri, Cileungsi, and Klapanunggal. Gunungputri, for example, has 5.8% of the total land availability for trade and service activities, while Cileungsi and Klapanunggal offer 1.6% and 2.2%, respectively. This strategic land availability can support the development of trade and service centers, leveraging strategic locations and good accessibility.

Fourth, for the industrial sector, Klapanunggal, Gunungputri, and Cileungsi are suitable choices. Klapanunggal stands out with 34% of the total land availability for industry, while Gunungputri and Cileungsi offer 31% and 19%, respectively. The ample land availability for industrial development in these sub-districts can support regional economic growth and job creation.

SWOT Analysis Results

The next step is to analyze the results of land availability analysis and AHP analysis, then formulate a SWOT analysis for land use directions in the Eastern Region of Bogor Regency. The SWOT analysis matrix can be seen in Table 13.

Table 13. List of internal strengths, internal weaknesses, external opportunities, and external threats in SWOT analysis.

CONCLUSION

Conclusion of this research are as follows:

1. The development of the Eastern Development Region (WP) in Bogor Regency as a Prospective New Autonomous Region (CDOB) requires an in-depth analysis of land suitability and availability. Land use patterns in the Eastern WP are still dominated by rainfed rice fields and mixed gardens, with varying degrees of land suitability in each sub-district. Gunung Putri, Klapanunggal, and Cileungsi sub-districts show relatively high suitability levels, while Sukamakmur has the lowest suitability level.
2. The analysis of land availability indicates that available land for development must consider the suitability of land use with the Spatial Planning (RTRW) and land ownership status. Comprehensive land use planning and resolution of land disputes are essential in ensuring sustainable and competitive development of the Eastern WP as a new autonomous region.
3. The land use direction of the Eastern WP in Bogor Regency has great potential for development in various sectors such as housing, agriculture, and industry. Several sub-districts like Sukamakmur, Jonggol, Tanjungsari, and Cariu have sufficient land for this development. However, infrastructure in some sub-districts like Cariu and Sukamakmur still needs improvement, and there is a risk of over-reliance on a single economic sector in some areas. Opportunities are open to develop trade and service centers in Gunungputri, Cileungsi, and Klapanunggal, as well as economic diversification throughout the region. However, attention must also be paid to regulatory changes and preparation for natural disasters to ensure sustainable regional development.

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Hanang Dewantoro¹, Janthy Trilusianthy Hidayat², Lilis Sri Mulyawati³ (2024)

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