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Housing development plans and strategies for low-income communities in Bogor City, Indonesia

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ABSTRACT

The demand for adequate housing for low-income communities (MBR) continues to increase in line with population growth and urbanization in Bogor City. Given this situation, a housing development plan and strategy for MBR is required—one that not only focuses on quantity but also takes residents' purchasing power into account. This strategy must involve active roles from the government, developers, and financial institutions in providing innovative and affordable financing solutions. The objectives of this study are (1) Analyzing housing needs of MBR in Bogor City; (2) Analyzing potential locations for MBR housing development in Bogor City; (3) Analyzing housing construction costs for MBR based on their rental or purchasing capacity in Bogor City (4) Formulating a housing development plan for MBR in Bogor City and (5) Formulating a housing development strategy for MBR in Bogor City. The methods used in this study include projecting the number of MBR residents and households, analyzing the housing backlog, performing GIS overlays, conducting surveys, interviewing developers, and determining priority strategies through A'WOT analysis (SWOT + AHP) using the Expert Choice 11 application. The results of this study show that the demand for MBR housing in Bogor City with subsidized type-36/72 units amounts to 31,201 units, requiring a total land area of 224.65 hectares. Potential land truly suitable for housing development—because it meets all criteria—is located in the East Bogor, North Bogor, West Bogor, and Tanah Sareal districts, covering 64.97 hectares. The expected purchase price for these homes for MBR is between IDR 150,000,000 and IDR 200,000,000. The housing development plan is designed in two phases: phase 1 covering 2025–2030 and phase 2 covering 2031–2040, utilizing both fully suitable potential land and marginally suitable land that has been upgraded. The priority strategies for MBR housing development in Bogor City are (i) utilizing potential land in Bogor City and providing policy support through a more integrated housing subsidy program; (ii) improving and optimizing public transportation and road access to MBR housing areas; and (iii) developing a funding scheme that includes grants or additional incentives for MBR projects.

Keywords: *A'WOT; Expected Purchase Price; GIS; Potential Land*

INTRODUCTION

The need for adequate housing for low-income communities (MBR) continues to increase along with population growth and urbanization occurring in Bogor City. The city has an appeal as one of Jakarta's buffer zones, which leads to a high level of migration and creates pressure on land demand. However, the availability of housing for MBR is still very limited due to several obstacles, such as the rising price of land, limited access to affordable financing schemes, and the low involvement of the private sector in social housing projects (Masarmon et al., 2023).

Low-income communities (MBR) in Bogor City face various challenges, such as limited income that makes it difficult for them to access adequate housing, both in terms of price and location. Most MBR in Bogor City work in the informal sector with irregular income, which hinders their access to conventional financing schemes. According to Fahirah et al. (2010), most of the available housing is located on the outskirts of the city, with low accessibility to economic activity centers and public services.

The housing profile in Bogor City shows a dominance of commercial housing intended for the middle to upper classes. On the other hand, housing for low-income communities (MBR) tends to receive less attention, both in terms of quantity and quality. According to data from the Central Statistics Agency, the housing backlog in Bogor City continues to increase, particularly for the MBR segment. In general, the housing profile of MBR in Bogor City indicates that they rely more on government programs, such as subsidized Mortgage Loans (KPR), to gain access to housing (BPS Kota Bogor, 2025). However, most of them still face obstacles in meeting administrative requirements, such as proof of steady income and credit guarantees. Therefore, solutions are needed to ensure that MBR can have access to adequate and affordable housing in Bogor City (Juliana & Riyanto, 2022).

In the context of policy, the government has introduced several initiatives such as the One Million Houses Program and subsidized Mortgage Loans (KPR) for low-income communities (MBR). However, implementation in the field often encounters various

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obstacles, such as complex bureaucracy, uneven distribution of housing, and challenges in providing suitable land at affordable prices. In addition, developers tend to focus more on housing development for the middle to upper segments, which are considered more economically profitable and have stronger purchasing power (Alonso, 1964).

Bogor City has significant potential in designing housing development policies based on community needs and regional characteristics. However, policymaking is often not grounded in accurate data and comprehensive spatial analysis. There is a need to evaluate previous programs and to develop a geospatial information system to support more targeted planning. According to Kurttila (2000), the utilization of spatial data is crucial in determining strategic locations for the development of affordable housing.

Housing development needs to be designed holistically by taking into account spatial planning, socio-economic aspects, and sustainability. Innovative approaches such as land value capture have been successfully applied in various developing cities to finance social housing (Smolka, 2013). This concept enables the government to recapture part of the land's added value to be used for the development of public facilities, including housing for vulnerable groups (Aprailsal Institute, 2004).Given these conditions, there is a need for housing development plans and strategies for MBR that focus not only on quantity but also on the purchasing power of the community. Such strategies must involve the active roles of the government, developers, and financial institutions in providing innovative and affordable financing solutions (Soeripto, 2008). In this way, inclusive and sustainable housing development can be realized, granting broader access for the people of Bogor City to obtain adequate housing in line with their financial capacity.

Through this study, it is expected that strategic measures can be identified for various stakeholders to address the existing challenges and promote the provision of affordable housing for all segments of society. The objectives of this study are as follows: 1) To analyze the housing needs of MBR in Bogor City; 2) To analyze potential locations for housing development for MBR in Bogor City; 3) To analyze the construction costs of housing for MBR based on their rental or purchasing capacity in Bogor City; and 4) To formulate housing development plans and strategies for MBR in Bogor City.

METHODOLOGY

Research Location

The study was conducted in Bogor City, West Java Province. Bogor City is located between 106°43'30" and 106°51'00" East and between 6°30'30"S and 6°41'00" South. The research location map is presented in Figure 1.

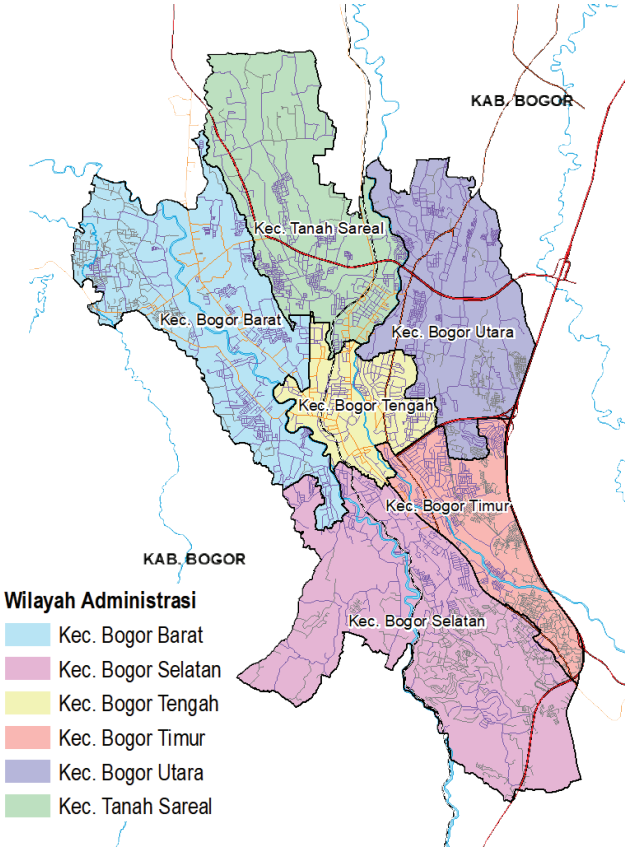


Figure 1. Map of research location in Bogor City, West Java Province, Indonesia.

Types of Data and Data Collection Techniques

Data collection was carried out using two methods, namely secondary data and primary data. Secondary data included demographic data obtained from the Bogor City Central Statistics Agency, as well as spatial data on the physical characteristics of the area and spatial planning data from the Department of Public Works and Spatial Planning of Bogor City. Primary data were collected through questionnaires distributed to MBR and A'WOT questionnaires administered to policymakers and relevant experts. A more detailed description is presented in Table 1.

Materials and Tools

The materials used in this study include demographic data, settlement area data, the most recent land-use/land cover data, and the spatial pattern plan (RTRW) of Bogor City. The tools used for data collection in this study include a laptop, a camera, and software such as Microsoft Office and Expert Choice 11.

Data Analysis

The data analysis techniques in this study consist of several stages. First, the analysis of housing needs for MBR in Bogor City was carried out using the geometric population projection formula to obtain data on housing backlog and housing needs by the year 2044. Second, the

Table 1. Types of data and data collection techniques.

No	Objectives	Types of Data	Data Collection Techniques
1	To analyze the housing needs of MBR in Bogor City.	•Number of low-income population (MBR) •Population Growth Rate •Number of low-income households (MBR) without homeownership •Number of low-income families (MBR)	Secondary Data Survey
2	To analyze potential locations for development Housing for MBR in Bogor City	•RTRW •RDTR •Land Price / Land Value	Secondary Survey
3	To analyze the housing construction costs for MBR (based on rental or purchasing capacity) in Bogor City.	•The ability of low-income residents (MBR) to rent and/or purchase •Residents' Income •Household Expenditure	Primary Survey (Observation, Interview, Documentation)
4	To formulate a housing development plan for MBR in Bogor City	The results of Objective 1, Objective 2, and Objective 3	Primary Survey (Observation, Interview, Documentation)
5	To formulate housing development strategies for MBR in Bogor City.	The results of Objective 4	Primary Survey (Observation, Interview, Documentation)

analysis of potential locations for housing development for MBR in Bogor City was conducted using an overlay analysis of spatial physical data with the spatial pattern plan (RTRW) to identify suitable potential land for housing construction (Saprudin & Mahmud, 2019). Third, the analysis of housing construction costs for MBR was based on their rental or purchasing capacity in Bogor City, conducted through questionnaire surveys targeting communities that meet the MBR criteria as well as MBR housing developers (Handayani, 2015). Subsequently, a housing development plan for MBR in Bogor City was formulated by considering various factors. Finally, strategies were developed and validated through interviews with experts, while priority strategies were determined using the Expert Choice 11 Application: Housing Needs Analysis for MBR.

The housing needs analysis for Low-Income Communities (MBR) in Bogor City is a quantitative and qualitative evaluation of the number of houses required by groups with limited purchasing power, based on population growth projections, the number of households, housing backlog, as well as the distribution and characteristics of MBR (Kurniati, 2019). The purpose of this analysis is to formulate strategies for providing adequate and affordable housing, while taking into account land constraints, government policies, and mechanisms such as land consolidation (Ilyanawati & Sihotang, 2017).

The data required for this analysis include the total population and number of households, the average population growth rate, the number of housing units, the ratio of households to housing units (backlog), population and household projections, the number of MBR population and households, and projections of MBR population and households.

The technique applied in this analysis is calculating the population projection of Bogor City using the geometric formula [Pt = P0 (1 + r)^t], After obtaining the population projection, the next step is to calculate the projected number of households by assuming that one (1) household consists of four (4) persons. Subsequently, the data on low-income communities (MBR) is determined using the average percentage of the poor population. The housing backlog is then calculated by subtracting the number of existing housing units from the total number of households; if the result is negative, it indicates the presence of a housing backlog (von Thünen, 1826). Furthermore, the total housing demand is calculated based on the housing backlog data combined with household growth. Finally, the projected housing units are divided into several types of houses, each with different building and land sizes, according to the planned housing typology, Among others: Type 1 (120/150), Type 2 (90/120), Type 3 (54/90), and Type 4 (36/72).

Analysis of Potential Locations for Housing Development for Low-Income Communities (MBR)

According to Saprudin & Mahmud (2019) overlay analysis is a commonly used method in Geographic Information Systems (GIS) to map and integrate spatial data from multiple map layers. This study employs overlay analysis to map strategic land locations for housing development based on land availability. In the context of housing development, this method helps identify strategic locations for residential construction by considering factors such as community purchasing power, accessibility, land availability, and public facilities. The expected output is the identification of potential

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locations for low-income housing (MBR) development in Bogor City (Ramadhan & Sebayang, 2022).

The data required for this analysis include the land morphology map, slope map, land cover map, housing area map based on the spatial pattern of the Regional Spatial Plan (RTRW) (areas permitted for housing development), infrastructure map, and maps of the distribution of social and public facilities.

The technique applied in this analysis is to identify potential land based on the physical conditions of the area by overlaying the land morphology map with the slope map (Raharjo, 2016). Next, potential land is identified through an overlay between the land cover map and the spatial pattern of the Regional Spatial Plan (RTRW). Subsequently, the potential land based on physical conditions is overlaid with the potential land identified from land cover and the RTRW spatial pattern, in order to produce land that is physically and spatially suitable. The next step is to filter the potential land locations with a minimum area of 1.5 hectares and a contiguous landform. Finally, the feasible potential land locations are determined based on criteria that must be fulfilled, namely: infrastructure conditions, proximity to the city center, distance to public and social facilities, and adequate accessibility to public transportation.

Cost Analysis of Housing Development for MBR Based on Rental or Purchase Affordability

The cost analysis of housing development for low-income communities (MBR) in Bogor City is carried out by preparing tabulations and calculating the average value of housing development for low-income communities (MBR) in Bogor City (Siahaan, 2003).

The data required for this analysis include the housing needs and rental affordability of low-income communities (MBR), as well as the capacity of developers to build subsidized housing. The technique applied is by distributing questionnaires to respondents who meet the criteria of low-income communities (MBR) in Bogor City.

Housing Development Plans and Strategies for MBR in Bogor City

The housing development plans and strategies for low-income communities (MBR) in Bogor City are determined through an A'WOT analysis using the Expert Choice 11 application, which combines the SWOT matrix with the pairwise comparison process of AHP. Each factor—Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T)—is then assigned a quantitative weight and ranked according to strategic priority (Kurttila et al., 2000). To obtain the weights of each SWOT strategy, interviews were conducted with policymakers, housing developers, and relevant experts.

The technique applied in this analysis consists of developing a SWOT matrix and identifying internal (S, W) and external (O, T) factors, followed by interviews related to SWOT strategies. Next, the goal hierarchy of A'WOT is established in Expert Choice 11, with the four SWOT strategies entered as criteria. Pairwise comparisons among factors within each strategy are then conducted to obtain local weights, ensuring a Consistency Ratio of less than 0.1. The local weights are subsequently synthesized into global weights to rank all SWOT factors simultaneously. Finally, the synthesis result analysis is performed in Expert Choice 11. The SWOT analysis flowchart is presented in Figure 2.

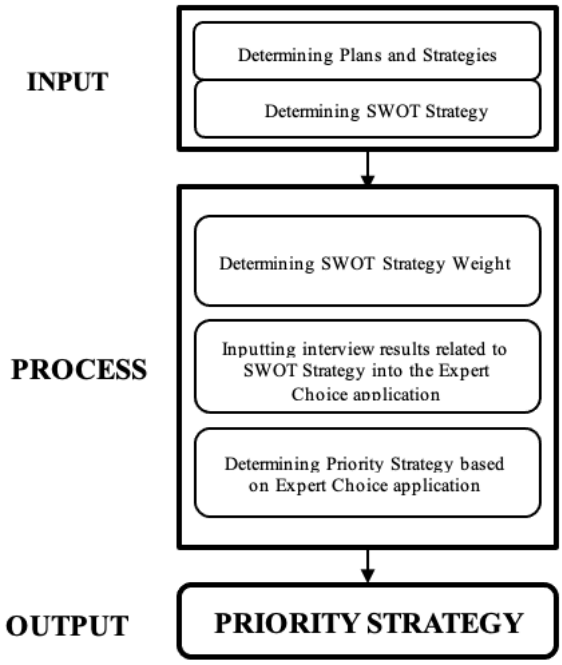


Figure 2. Flowchart of A'WOT analysis.

RESULTS AND DISCUSSION

Housing Needs Analysis for MBR in Bogor City

The analysis of housing needs for low-income communities (MBR) in Bogor City was carried out using population data for 2024 obtained from the Central Bureau of Statistics (BPS) of Bogor City. The population data of Bogor City in 2024 is presented in Table 2.

Table 2. Demographics of Bogor City in 2024.

No	District	Total Population	Total Households	Poor Population	Poor Households
1	South Bogor	212,423	53,106	13,871	3,468
2	East Bogor	107,573	26,893	7,025	1,756
3	North Bogor	192,43	48,108	12,566	3,141
4	Central Bogor	95,758	23,94	6,253	1,563
5	West Bogor	241,738	60,435	15,785	3,946
6	Tanah Sareal	228,429	57,107	14,916	3,729
	Total	**1,078,351**	**269,588**	**70,416**	**17,604**

Source: BPS Kota Bogor (2025)

Analysis of Population and Household Projections

The projected population in Bogor City in 2044 is 1,295,643 people, with the highest number of residents in Tanah Sareal District at 292,227 people, and the lowest projected population in Central Bogor District with 97,496 people. Further details can be seen in Table 3.

Table 3. Population projection in Bogor City 2029–2044.

No	District	Population Projection Year (People)			
		2029	2034	2039	2044
1	South Bogor	224,144	236,512	249,563	263,334
2	East Bogor	112,056	116,727	121,592	126,659
3	North Bogor	200,351	208,597	217,184	226,123
4	Central Bogor	96,19	96,623	97,059	97,496
5	West Bogor	252,939	264,659	276,922	289,754
6	Tanah Sareal	242,947	258,388	274,81	292,277
	Total	**1,128,627**	**1,181,507**	**1,237,130**	**1,295,643**

The projection analysis of the number of households in Bogor City assumes that one (1) household consists of four (4) people. The calculation of the household projection uses the results of the population projection analysis in Bogor City for 2029–2044, so it can be seen that the number of households in Bogor City in 2044 is 323,911 households. For more details, see Table 4.

Table 4. Projection of the number of households in Bogor City for 2029–2044.

No	District	Projected Year of Households (HH)			
		2029	2034	2039	2044
1	South Bogor	56,036	59,128	62,391	65,834
2	East Bogor	28,014	29,182	30,398	31,665
3	North Bogor	50,088	52,149	54,296	56,531
4	Central Bogor	24,047	24,156	24,265	24,374
5	West Bogor	63,235	66,165	69,231	72,438
6	Tanah Sareal	60,737	64,597	68,703	73,069
	Total	**282,157**	**295,377**	**309,282**	**323,911**

Projection Analysis of the Number of Low-Income Communities in Bogor City

The projection analysis of low-income communities is calculated using the same formula as the population projection analysis, namely the geometric population projection formula, with an approach using the number of poor people in 2024 and the average percentage of poor people in Bogor City from 2020 to 2024, which is 6.8%. The largest number of poor people in 2044 is in West Bogor District with 58,841 people, while the lowest number of poor people is in Central Bogor District with 23,308 people. For more details, see Table 5.

The calculation of the projected number of low-income households uses the results of the poor population projection analysis in Bogor City for 2029–2044, with the assumption that one (1) household consists of four (4) people. Thus, it can be seen that the number of poor households in Bogor City in 2044 is 65,620 households. For more details, see Table 6.

Table 5. Projection of the number of low-income communities in Bogor City for 2029-2044.

No	District	Projection of Poor Population (People)			
		2029	2034	2039	2044
1	South Bogor	19,274	26,781	37,212	51,706
2	East Bogor	9,761	13,562	18,845	26,184
3	North Bogor	17,46	24,260	33,710	46,839
4	Central Bogor	8,688	12,073	16,775	23,308
5	West Bogor	21,934	30,477	42,347	58,841
6	Tanah Sareal	20,726	28,799	40,016	55,602
	Total	**97,843**	**135,952**	**188,904**	**262,481**

Table 6. Projection of the number of low-income households in Bogor City in 2044.

No	District	Projection of Poor Population (People) in 2044	
		Population (People)	Households
1	South Bogor	51,706	12,926
2	East Bogor	26,184	6,546
3	North Bogor	46,839	11,710
4	Central Bogor	23,308	5,827
5	West Bogor	58,841	14,710
6	Tanah Sareal	55,602	13,900
	Total	**262,481**	**65,620**

Analysis of Housing Needs for Low-Income Communities in Bogor City

Based on housing needs data in Bogor City in 2024, there is a housing backlog reaching 8,078 units. South Bogor District has the highest backlog or housing deficit, amounting to 4,255 units, while in Tanah Sareal District there is a surplus of housing units. However, the housing backlog is not only calculated from the total physical buildings compared to the number of households. The housing needs and land area requirements for low-income communities (MBR) in Bogor City in 2024 are presented in Table 7 and Table 8.

Table 7. Housing needs in Bogor City in 2024.

No	District	Households	Housing Units	Housing Backlog
1	South Bogor	53,106	48,851	4,255
2	East Bogor	26,893	25,639	1,254
3	North Bogor	48,108	47,671	437
4	Central Bogor	23,49	22,443	1,497
5	West Bogor	60,435	59,800	635
6	Tanah Sareal	57,107	60,997	0
	Total	**269,589**	**265,401**	**8,078**

Table 8. Land area requirements for MBR in Bogor City in 2024.

No	District	Land Area Requirement (Ha)	Land Area Requirement for Type 36/72 Housing (m^2)
1	South Bogor	51,706	12,926
2	East Bogor	26,184	6,546
3	North Bogor	46,839	11,710
4	Central Bogor	23,308	5,827
5	West Bogor	58,841	14,710
6	Tanah Sareal	55,602	13,900
	Total	**262,481**	**65,620**

Based on the calculation results, the housing backlog in 2024 amounted to 8,078 units, and when added to the

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housing needs due to household growth of 54,322 units, the total number of housing units needed in Bogor City in 2044 is 62,400. The land area required for Type 36/72 low-income housing (MBR) is 2,246,472 m². The housing needs and land area requirements for MBR in Bogor City in 2044 are presented in Table 9 and Table 10.

Table 9. Housing needs in Bogor City in 2044.

No	District	Households	Housing Units	Housing Backlog
1	South Bogor	4,255	12,728	16,983
2	East Bogor	1,254	4,772	6,026
3	North Bogor	437	8,423	8,86
4	Central Bogor	1,697	434	1,931
5	West Bogor	635	12,003	12,638
6	Tanah Sareal	0	15,962	15,962
	Total	**8,078**	**54,322**	**62,400**

Table 10. Land area requirements for MBR in Bogor City in 2044.

No	District	Land Area Requirement (Ha)	Land Area Requirement for Type 36/72 Housing (m^2)
1	South Bogor	150.30	611,424
2	East Bogor	53.33	216,936
3	North Bogor	78.40	318,96
4	Central Bogor	17.10	69,552
5	West Bogor	111.84	454,968
6	Tanah Sareal	141.26	574,632
	Total	**552.23**	**2,246,472**

Analysis of Potential Locations for Low-Income Housing Development in Bogor City

Analysis of Potential Land Based on Physical Conditions of the Area

The potential land area based on the physical conditions of Bogor City is 10,609.04 hectares. For more details, see Figure 3 and Table 11.



Figure 3. Map of potential land based on physical conditions of the area.

Table 11. Potential land based on physical conditions of the area.

No	District	Potential Land Area Based on Physical Conditions (Ha)			Total (Ha)
		Population	Less Potential	Not Potential	
1	South Bogor	2,781.49	237.46	31.26	3,050.21
2	East Bogor	1,010.46	19.72	16.21	1,046.39
3	North Bogor	1,792.78	17.55	3.41	1,813.74
4	Central Bogor	776.51	41.55	18.62	836.68
5	West Bogor	2,221.01	59.1	51.45	2,331.56
6	Tanah Sareal	2,026.79	23.02	10.2	2,060.01
	Total	**10,609.04**	**398.40**	**131.15**	**11,138.59**

Analysis of Potential Land Based on Land-use / Land Cover and Spatial Plan for Residential Areas

The potential land area based on land-use/land cover in Bogor City is 1,457 hectares, with the largest area located in South Bogor District at 740.52 hectares, while Central Bogor District has no potential land based on land-use/land cover, as most of its area is already developed. For more details, see Table 12 and Figure 4.

Table 12. Potential land based on land-use/land cover and spatial plan for residential areas.

No	District	Potential Land Area Based on Land-use / Land Cover and Spatial Plan for Residential Areas (Ha)			Total (Ha)
		Population	Less Potential	Not Potential	
1	South Bogor	740.67	821.93	423.46	1,986.06
2	East Bogor	103.87	280.73	247.27	631.87
3	North Bogor	197.75	597.04	368.45	1,163.24
4	Central Bogor	-	75.04	229.07	304.11
5	West Bogor	195.62	915.21	390.91	1,501.74
6	Tanah Sareal	219.67	665.07	631.56	1,516.30
	Total	**1,457.58**	**3,355.02**	**2,290.72**	**7,103.32**

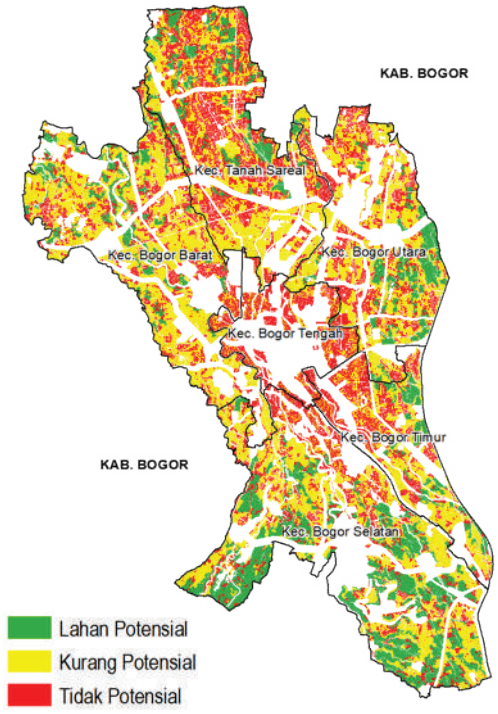


Figure 4. Map of potential land based on land-use/land cover and spatial plan for residential areas.

Analysis of potential land based on physical conditions, land-use/land cover, and spatial plan for residential areas

The potential land area for housing development in Bogor City is 1,277.28 hectares, with the largest area located in South Bogor District at 614.46 hectares, followed by Tanah Sareal District at 209.88 hectares, North Bogor District at 194.93 hectares, West Bogor District at 160.05 hectares, and East Bogor District at 97.97 hectares. Meanwhile, Central Bogor District no longer has potential land. For more details, see Table 13 and Figure 5.

Table 13. Potential land based on physical conditions, land-use / land cover, and spatial plan for residential areas.

No	District	Potential Land for Housing Development Based on Physical Conditions, Land-use / Land Cover, and Spatial Plan for Residential Areas (Ha)			Total (Ha)
		Population	Less Potential	Not Potential	
1	South Bogor	614.58	958.8	412.66	1,986.04
2	East Bogor	97.99	316.52	217.36	631.87
3	North Bogor	194.97	660.91	307.36	1,163.24
4	Central Bogor	-	124.24	179.87	304.11
5	West Bogor	160.07	969.84	371.84	1,501.75
6	Tanah Sareal	209.91	860.29	446.11	1,516.31
	Total	**1,277.52**	**3,890.60**	**1,935.20**	**7,103.32**

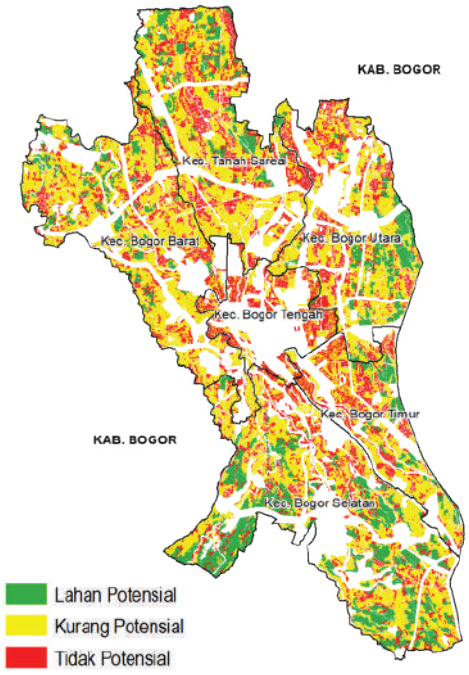


Figure 5. Map of potential land based on physical conditions, land-use/land cover, and spatial plan for residential areas.

Determination of Potential Land Locations Suitable for Development

The determination of potential land locations suitable for development is not only based on the physical conditions of the area, land-use/land cover, and spatial planning policies, but also considers feasibility criteria. To determine suitable potential land locations, four criteria are used: (a) having a minimum land area of 1.5 hectares with a wide expanse and not elongated or tapered; (b) accessibility to the location; (c) availability of public and social facilities; and (d) condition of supporting infrastructure. The criteria are presented in Table 14.

Table 14. Criteria for determining potential land suitable for development.

No	Criteria	Feasibility		
		Feasible	Less Feasible	Not Yet Feasible
1	Minimum land area of 1.5 Ha	≥ 1.5 Ha	≥ 1.5 Ha	≤ 1.5 Ha
2	Accessibility to location	Good	Fair	Poor
3	Availability of public and social facilities	Complete	Incomplete	Very Incomplete
4	Condition of supporting infrastructure	Good	Fair	Poor

Potential land for housing development that meets the criteria is located in East Bogor District, North Bogor District, West Bogor District, and Tanah Sareal District. The potential land in South Bogor District is still less feasible because it does not yet meet the criteria. For more details, see Table 15 and Figure 6.

Table 15. Potential land suitable for development.

No	District	Potential Land Area Based on Physical Conditions (Ha)		
		Population	Less Potential	Not Potential
1	South Bogor	0	186.88	427.71
2	East Bogor	2.14	65.27	30.58
3	North Bogor	28.37	71.39	95.21
4	Central Bogor	22.06	51.13	86.87
5	West Bogor	12.4	76.47	121.04
	Total	**64.97**	**451.14**	**761.41**

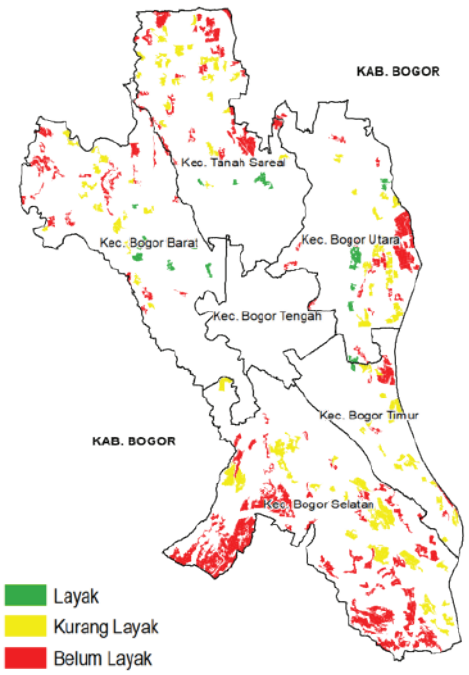


Figure 6. Map of potential land locations suitable for development.

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Determining Potential Land Locations Suitable for Development Based on Building Type

Determining potential land locations suitable for development based on building type, specifically for 5-story apartment buildings, is based on the criteria of land area between 1.5 and 3 hectares, closest to road access, and not blocking sunlight from the surrounding area. Potential land locations suitable for development based on building type are presented in Table 16, Table 17, and Figure 7.

Table 16. Potential land area suitable for building based on type of apartment building.

No	District	Potential Land for Housing Development Based on Physical Conditions, Land-use / Land Cover, and Spatial Plan for Residential Areas (Ha)		
		Eligible	Less Eligible	Not Eligible
1	South Bogor	-	3.39	8.04
2	East Bogor	-	3.74	-
3	North Bogor	-	1.7	5.06
4	Central Bogor	4.21	3.88	2.91
5	West Bogor	3.49	7.97	6.87
Total (Ha)		**7.7**	**20.68**	**22.88**

Table 17. Potential land area suitable for building based on type of landed house building.

No	District	Potential Land Area Suitable for Development Based on Building Type Terrain House (Ha)		
		Eligible	Less Eligible	Not Eligible
1	South Bogor	-	183.45	419.81
2	East Bogor	2.14	61.51	30.58
3	North Bogor	28.36	69.68	90.14
4	West Bogor	17.85	47.24	83.95
5	Tanah Sareal	8.91	68.49	114.15
Total (Ha)		**57.26**	**430.37**	**738.63**

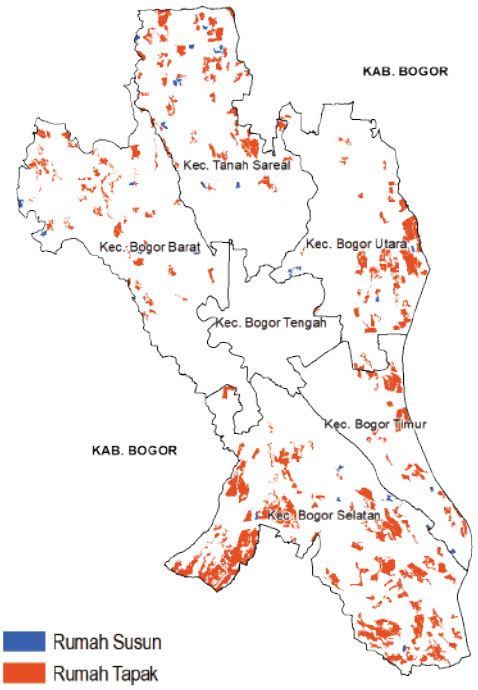


Figure 7. Map of potential land locations suitable for building based on building type.

Based on the site determination results, most of the suitable potential land is intended for landed houses, while a portion can be developed into apartment buildings. Land that is truly suitable for constructing 5-story apartment buildings amounts to only 7.70 hectares, concentrated in West Bogor District covering 4.21 hectares and in Tanah Sareal District covering 3.49 hectares.

Analysis of Home Construction Costs for Low-Income Residents Based on Rent or Purchase Ability in Bogor City

Current Conditions of Low-Income Communities

The majority of homes are owned by themselves, with some renting and living with family. The majority of homes have good accessibility to surrounding amenities. Rental prices, or monthly fees, generally range from Rp 500,000 to Rp 1,000,000. The main obstacles to homeownership are the high cost and the lack of assistance programs. For more details, see Table 18.

Table 18. Ownership status and type of residence.

Aspect	Category	Total
Ownership	Yes	11
	No	9
Status	Own Property	11
	Rent	2
	Living with Family	7
Type	Landed House	16
	Rental House	4

Needs and Rental Capacity of Low-Income Communities

Most people prefer affordable housing, emphasizing the importance of locations close to workplaces or with adequate transportation access. The desired housing type is primarily landed houses with varying sizes. The preferred land area ranges from 60–72 m², with a building area of 28–36 m². In addition to landed houses, some also prefer apartment-style housing with a building area of 30–36 m². For more details, see Table 19.

Table 19. Housing type needs for MBR.

Housing Type	Area (m^2)		Total
	Building	Land	
Landed House Type 28/60	28	60	3
Landed House Type 30/60	30	60	4
Landed House Type 36/72	36	72	8
Apartment Type 30	30	-	3
Apartment Type 36	36	-	2

Developers' Capacity to Build Subsidized Housing

To build one unit of a low-income housing (MBR) unit, it requires an estimated cost of approximately IDR 165,000,000 – IDR 200,000,000, with the condition that

the land price does not exceed IDR 300,000 per square meter and the building area ranges between 21 m² – 36 m², with a land area of 60 m² – 100 m². The selling price of one housing unit is marked up by around 15% – 20% of the construction cost. For example, if the construction cost of one unit is IDR 170,000,000, the developer would sell the unit at a price between IDR 195,000,000 – IDR 204,000,000.

Housing Development Plans and Strategies for MBR in Bogor City

Housing Development Plans for MBR in Bogor City

The housing development plan for low-income communities (MBR) in Bogor City is prepared on potential land plots based on various planning considerations. The planning considerations used in formulating the MBR housing development plan are as follws:

a. The number of low-income households (MBR) in each district;

b. The housing needs for MBR in each district;

c. Availability of potential and less-potential land in each district;

d. Rental/purchase capacity of MBR;

e. Preferred housing types, namely landed houses 36/72 and apartments with a building area of 36 m², as desired by MBR;

f. For MBR housing in Central Bogor district where there is no potential land, the development will be planned in the nearest available location; and

g. Regarding apartments, the higher the floor, the lower the rental or purchase price.

Based on these considerations, a housing development plan was prepared to meet the demand for MBR homes, specifically 36/72 type units, totaling 31,201 units and requiring a land area of 2,246,472 m². From the location analysis, the potential land in Bogor City suitable for constructing 5-story apartments and 36/72 landed houses in Zone 2 amounts to only 64.97 hectares. Therefore, it is necessary to improve the suitability of less-adequate land so that the MBR housing needs can be fully met.

The housing development plan for MBR in Bogor City consists of two phases: Phase 1 from 2025 to 2030 and Phase 2 from 2031 to 2040. The details of MBR housing development for each period are as follows:

a. The construction of MBR housing in Phase 1, during the 2025–2030 period, will utilize suitable potential land, with the land allocation as follows:

1) The construction of 5-story Rusunawa (low-cost apartments) in Phase 1, during the 2025–2030 period, will be carried out in West Bogor and Tanah Sareal districts, with the land allocation proportions shown in Table 20.

Table 20. Phase 1 construction of 5-story Rusunawa (low-cost apartments).

No	District	Land Allocation Proportion			
		RTH and Facilities (m²)	Circulation and Parking (m²)	Building (m²)	House (Units)
1	West Bogor	14,736.54	10,526.10	16,841.76	2,339
2	Tanah Sareal	12,200.54	8,714.67	13,943.48	1,937
	Total	**26,937.08**	**19,240.77**	**30,785.24**	**4,276**

2) The construction of 36/72 type landed houses in Phase 1, during the 2025–2030 period, will be carried out in the districts of East Bogor, North Bogor, West Bogor, and Tanah Sareal, with the land allocation proportions shown in Table 21.

Table 21. Phase 1 construction of 36/72 type landed houses.

No	District	Land Allocation Proportion			
		RTH and Facilities (m²)	Road (m²)	Area (m²)	House (Unit)
1	East Bogor	6,421.78	2,140.59	12,843.56	178
2	North Bogor	85,102.89	28,367.63	170,205.79	2,364
3	West Bogor	53,560.20	17,853.40	107,120.40	1,488
4	Tanah Sareal	26,743.90	8,914.63	53,487.80	743
	Total	**171,828.78**	**57,276.26**	**343,657.55**	**4,773**

b. The construction of MBR housing in Phase 2, during the 2031–2040 period, will utilize potential land that is still less suitable, provided that improvements and fulfillment of the necessary facilities have been made so that the land meets the criteria for suitable development. The land allocation is as follows:

1) The construction of 5-story Rusunawa (low-cost apartments) in Phase 2, during the 2031–2040 period, will be carried out in districts with less suitable potential land, with the land allocation proportions shown in Table 22.

Table 22. Phase 2 construction of 5-story Rusunawa (low-cost apartment).

No	District	Land Allocation Proportion			
		RTH and Facilities (m²)	Circulation and Parking (m²)	Building (m²)	House (Units)
1	South Bogor	11,869.17	8,477.98	13,564.76	1,884
2	East Bogor	13,081.24	9,343,74	14,949.99	2,076
3	North Bogor	5,940.89	4,243.49	6,789.59	943
4	West Bogor	13,594.43	9,710.30	15,536.49	2,158
5	Tanah Sareal	27,899.56	19,928.26	31,885.21	4,429
	Total	**72,385.28**	**51,703.77**	**82,726.04**	**11,490**

1) The construction of 36/72 type landed houses in Phase 2, during the 2031–2040 period, will be carried out in districts with less suitable potential land, with the land allocation proportions shown in Table 23.

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Table 23. Phase 2 construction of 36/72 type landed houses.

No	District	Land Allocation Proportion			
		RTH and Facilities (m^2)	Road (m^2)	Area (m^2)	House (Unit)
1	South Bogor	550,469.14	183,489.71	1,100,938.29	15,291
2	East Bogor	184,583.10	61,527.70	369,166.20	5,127
3	North Bogor	209,079.96	69,693.32	418,159.93	5,808
4	West Bogor	141,736.41	47,245.47	283,472.82	3,937
5	Tanah Sareal	205,497.92	68,499.31	410,995.84	5,708
	Total	**1,291,366.54**	**430,455.51**	**2,582,733.07**	**35,871**

a. The monthly rental price of 5-story apartments is differentiated by floor, noting that the rent can be adjusted by the apartment management. The rental prices per floor are as follows: Floor 1 = IDR 450,000, Floor 2 = IDR 425,000, Floor 3 = IDR 400,000, Floor 4 = IDR 375,000, and Floor 5 = IDR 350,000.

b. The selling price of 36/72 type landed houses ranges from IDR 185,000,000 to IDR 200,000,000.

Housing Development Strategy for Low-Income Communities (MBR) in Bogor City

The strategy formulation and prioritization are carried out using A'WOT, which combines two analyses: SWOT to identify proposed strategies to be developed, and AHP (Analytical Hierarchy Process) to determine the priority strategies.

a. SWOT Analysis

The SWOT analysis aims to identify alternative strategies that are considered feasible and suitable for implementation. SWOT analysis has key components that need to be understood first, namely the formulation of internal factors or the Internal Factors Analysis System (IFAS) and external factors or the External Factors Analysis System (EFAS). Internal factors include strengths and weaknesses, while external factors include opportunities and threats.

To derive strategies through SWOT analysis, each factor is assigned a weight. The most important aspect of weighting is that the total weight for internal factors must equal 1.00, as they are considered a single, unified whole. The same applies to external factors. These weights are then multiplied by their respective ratings, which are the average scores given by respondents for each factor statement. The rating scale ranges from 1 to 5 and is determined based on the effectiveness in guiding the MBR housing development strategy in Bogor City.

For more details on the weighting of the Internal Factors Analysis System (IFAS) and External Factors Analysis System (EFAS), see Table 24 and Table 25.

The results of the Internal Factors Analysis System (IFAS) weighting for internal factors show that the strength (S) factor scored 2.17, while the weakness (W) factor scored 2.25, with a total internal factor score of 4.42.

The results of the External Factors Analysis System (EFAS) weighting for external factors show that the opportunities (O) factor scored 2.46, while the threats (T) factor scored 2.47, with a total external factor score of 4.93.

Table 24. Weighting of the Internal Factors Analysis System (IFAS).

No	Internal Factor	Weight	Rating	Weight x Rating
Strengths (S)				
1	Bogor City's strategic location for MBR housing	0.20	4.85	0.97
2	Bogor City Government policies already support MBR housing development	0.15	4.30	0.65
3	Public infrastructure in Bogor City is adequate for MBR	0.10	3.68	0.37
4	Bogor City's economic potential supports MBR purchasing power	0.05	3.73	0.19
	Total (S)	**0.50**		**2.17**
Weakness (W)				
1	Limited availability of affordable land in Bogor City	0.14	4.90	0.69
2	High population and population growth rate in Bogor City	0.10	4.30	0.43
3	Significant backlog of subsidized housing in Bogor City	0.09	3.82	0.34
4	High construction costs for MBR housing	0.12	4.62	0.55
5	Many MBR households have limited understanding of housing financing and subsidy schemes	0.05	4.70	0.24
	Total (S)	**0.50**		**2.25**
	Overall Total (S+W)	**1.00**		**4.42**

Table 25. Weighting of the External Factors Analysis System (EFAS).

No	External Factor	Weight	Rating	Weight x Rating
Opportunities (O)				
1	Central government support and easily accessible housing subsidy programs	0.20	4.90	0.98
2	Partnerships with developers can accelerate MBR housing development	0.15	4.90	0.74
3	Better accessibility increases interest in MBR housing	0.10	4.93	0.49
4	Use of more efficient construction technology can reduce building costs	0.05	4.97	0.25
	Total (O)	**0.50**		**2.46**
Threats (T)				
1	Increase in land prices due to speculation driving up land costs Risk of disasters and	0.20	4.98	1.00

2	environmental issues affecting MBR housing locations	0.15	4.95	0.74
3	Limited project budget from the government or developers for MBR housing	0.15	4.88	0.73
	Total (T)	**0.50**		**2.74**
	Overall Total (O+T)	**1.00**		**4.93**

The next step is to determine strategies to optimize existing strengths and potentials while minimizing potential challenges. The results are presented in Table 26.

Table 26. Matrix of interaction IFAS-EFAS SWOT

INTERNAL FACTOR / EXTERNAL FACTOR	***Strength* (S)** 1. Bogor City's strategic location for MBR housing 2. Bogor City Government policies already support MBR housing development 3. Public infrastructure in Bogor City is adequate for MBR 4. Bogor City's economic potential supports MBR purchasing power	***Weakness* (W)** 1. Limited availability of affordable land in Bogor City 2. High population and population growth rate in Bogor City 3. *Significant backlog of subsidized housing in Bogor City* 4. High construction costs for MBR housing 5. Many MBR households have limited understanding of housing financing and subsidy schemes
***Opportunities* (O)** 1. Central government support and easily accessible housing subsidy programs 2. Partnerships with developers can accelerate MBR housing development 3. A Better accessibility increases interest in MBR housing 4. Use of more efficient construction technology can reduce building costs	**SO Strategies** 1. Utilize potential land in Bogor City and provide government policy support by designing more integrated housing subsidy programs; 2. Collaborate with financial institutions and housing developers; 3. Improve and optimize public transportation and road access to MBR housing areas.	**WO Strategies** 1. implement innovative construction technologies such as simple apartments or low-cost multi-unit housing to meet housing needs on limited land; 2. Conduct workshops, seminars, and digital campaigns to explain available subsidy mechanisms and credit schemes so that MBR households are financially better prepared; 3. Socialize apartment-living schemes to prospective residents.
***Threats* (T)** 1. Increase in land prices due to speculation driving up land costs 2. Risk of disasters and environmental issues affecting MBR housing locations 3. Limited project budget from the government or developers for MBR housing	**ST Strategies** 1. Develop regulations to control land prices and involve third parties in monitoring using real-time information systems to enable quick preventive action; 2. Apply risk-based spatial planning.	**WT Strategies** 1. Design funding schemes that involve grants or additional incentives for MBR projects; 2. Provide training and capacity building for developers and contractors on cost-efficient building techniques.

b. Analytical Hierarchy Process (AHP)

To determine the priority strategies that can be adopted in formulating MBR housing development strategies, the Analytical Hierarchy Process (AHP) method is used, assisted by the Expert Choice 11 program. The first step in determining strategy priorities from the SWOT-derived strategies is to create a treeview, which will later serve as the basis for questions in the questionnaire. After the treeview is prepared as described above, the next step is to design the questionnaire, which will be distributed to experts in the relevant fields.

The next step is to identify the experts who will serve as respondents for this analysis. Once the questionnaires are completed by the respective experts, the data is entered into the Expert Choice 11 program, with each expert's responses recorded in the corresponding columns. The survey data can then be analyzed to determine the priority strategies. After ensuring that the data is entered accurately according to each respondent's answers, the synthesis result feature is activated, which automatically displays the priority strategies. It must be ensured that the random consistency index (RCI) value is below 0.1. The synthesis results from the AHP model are presented in Figure 8.

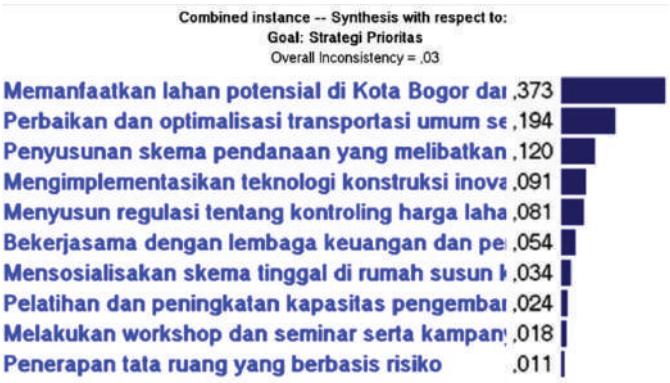


Figure 8. Synthesis Result of AHP model.

The results of the AHP synthesis model show that the pairwise comparison questionnaires completed by the expert respondents are acceptable, as the random consistency index (RCI) value is 0.03. The priority order of strategies based on the AHP synthesis results is as follows:

1. Utilize potential land in Bogor City and provide government policy support by developing a more integrated housing subsidy program;
2. Improve and optimize public transportation and road access to MBR housing areas;
3. Design funding schemes that involve grants or additional incentives for MBR projects;
4. Implement innovative construction technologies, such as simple apartments or low-cost multi-unit housing, to meet housing needs on limited land;
5. Regulations to control land prices, involve third parties in monitoring, and use a real-time information system to provide market price updates so that preventive actions can be implemented quickly;
6. Collaborate with financial institutions and housing developers;
7. Socialize the apartment-living scheme to prospective residents;
8. Provide training and capacity building for developers and contractors on cost-efficient building techniques;
9. Conduct workshops, seminars, and digital campaigns to explain available subsidy mechanisms and credit schemes, enabling MBR households to be better financially prepared;
10. Implement risk-based spatial planning.

CONCLUSION

Housing demand in Bogor City was estimated at 8,078 units in 2024, requiring approximately 71.43 hectares of land, including 4,039 units of type 36/72 housing for low-income households (Masyarakat Berpenghasilan Rendah, MBR). By 2044, demand is projected to increase substantially to 62,400 units, requiring approximately 552.23 hectares, of which 31,201 units are expected to serve MBR households. These

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projections demonstrate the urgency of developing an integrated and sustainable housing strategy to meet the growing demand for affordable housing.

Spatial analysis identified 1,277.28 hectares of potential land for housing development. However, only 64.97 hectares were classified as fully suitable, while 451.14 hectares were considered less suitable and 761.17 hectares not yet suitable. This limited availability of suitable land underscores the need to optimize existing land resources. Areas with lower suitability require further assessment and, where feasible, infrastructure improvements, subject to spatial planning regulations and environmental safeguards.

The financial analysis revealed a gap between housing affordability and development costs. The estimated affordable selling price for MBR housing ranges from IDR 150 million to IDR 200 million per unit, compared with developer construction costs of IDR 165 million to IDR 200 million. This gap highlights the importance of government intervention through housing subsidies, financial incentives, and innovative financing schemes to improve affordability and encourage private-sector participation.

The proposed development plan comprises two phases: 2025–2030 and 2031–2040. Phase 1 includes 4,276 five-story rental apartment units (Rumah Susun Sederhana Sewa, RUSUNAWA) and 4,773 type 36/72 landed houses. Phase 2 includes 11,490 RUSUNAWA units and 35,871 landed houses. Proposed monthly rental rates range from IDR 350,000 to IDR 450,000, depending on floor level, while landed house prices are estimated at IDR 185 million–IDR 200 million per unit. Implementation should be supported by adequate infrastructure and essential services to ensure accessibility, affordability, and residential quality.

The Analytical Hierarchy Process (AHP) identified several priority strategies: optimizing potential housing land; strengthening integrated housing subsidy policies; improving public transportation and road connectivity; expanding financing through grants and incentives; and adopting innovative, low-cost construction technologies, particularly multi-unit housing, to address land constraints. Furthermore, effective land price control mechanisms, supported by independent monitoring and real-time market information systems, are needed to prevent excessive land price increases.

Overall, addressing Bogor City's growing MBR housing demand requires an integrated approach combining spatial planning, land suitability assessment, financial support, infrastructure provision, innovative housing development, and effective land governance. The proposed phased development framework provides a basis for aligning future housing needs with available land resources and household affordability. Its implementation will require sustained coordination among local government, developers, financial institutions, and other stakeholders. Integrating these strategies into adaptive and consistent housing policies will be essential to improving affordable housing provision, optimizing limited urban land, and promoting inclusive and sustainable urban development.

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