GIS-Based Land Suitability Analysis for School Development Planning in Indonesia's New Capital City (IKN)

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Abstract
The planning of school construction in the Nusantara Capital City (IKN) requires an integrated approach to ensure that educational facilities align with the region's characteristics and development goals. As a new capital, IKN faces challenges in determining school locations that are not only physically viable but also support sustainable and equitable access to education. This study aims to analyze land suitability as a basis for school planning in the IKN area by utilizing Geographic Information Systems (GIS). The research employs a quantitative descriptive approach with spatial analysis methods. The analysis is based on several parameters, including road network accessibility, proximity to rivers, slope inclination, land use, and disaster risk levels. The results indicate that the study area is categorized into several land suitability classes: highly suitable, suitable, moderately suitable, marginally suitable, and unsuitable. Areas with high suitability generally feature supportive physical conditions and good accessibility, making them potential priorities for school development. The findings of this study provide a land suitability map and guidelines for school development zones, which are expected to serve as a foundation for more targeted and sustainable educational planning in IKN.

Keywords: Educational planning, Land suitability, Geographic information system (GIS), Nusantara capital city (IKN)

Introduction

The relocation of the national capital is part of an effort to achieve equitable development and economic growth across the country. This decision is based on Law No. 3 of 2022, requiring every stage of development to be strictly integrated to avoid urban governance failures. This redistribution is being carried out to reduce the increasing ecological and demographic burdens on certain islands (Bappenas, 2020). The success of IKN's development requires mature and integrated regional planning to prevent future socio-economic issues.

A crucial part of IKN's development planning is the expansion of the education sector. Without planning for adequate educational facilities, the vision of IKN cannot be achieved, as access to inclusive education is a basic right for every citizen who will inhabit the area. School construction is also a primary focus in educational facility planning. Schools must be placed in strategically appropriate locations to ensure student accessibility and the effectiveness of educational services. In terms of physical geography, land suitability analysis is essential before construction begins. Selecting appropriate land will ensure the sustainability of school buildings while guaranteeing the safety and comfort of students (Ministry of PUPR, 2021).

Determining suitable locations for school construction can be achieved through Geographic Information Systems (GIS). GIS can map priority areas for new schools while assessing risks related to hazardous land use and service inequality (Lagrab & Aknin, 2017). In Indonesia, assessing school site suitability has been implemented through GIS analysis using overlay, buffer, and scoring methods to evaluate parameters such as accessibility, disaster vulnerability, and alignment with spatial planning (Djuraini et al., 2022). Determining school locations based on land suitability is valuable for decision-making in regional educational development. This study is intended to provide an overview of school construction planning based on land suitability, as well as directions for the future development of the education sector.

Educational planning is a vital component in supporting targeted and sustainable development, particularly in providing educational facilities that align with regional characteristics. Through proper planning, school construction can be directed to support equitable educational services and improve the efficiency of land use within the context of regional development (Zahraa, Nurwulan, & Mulyani, 2024). In region-based educational planning, the spatial aspect is a key element because it directly relates to determining strategic and accessible school locations. One approach used is school mapping, which places geographic location as the basis for school development planning. This approach emphasizes the analysis of school distribution and accessibility within a region to support a more structured educational network, especially in new development areas. Correspondingly, school construction planning must be aligned with the direction of regional development to support the sustainability of educational progress. Therefore, land suitability analysis is essential in determining the right areas for school construction, ensuring that the selected locations are not only physically viable but also consistent with the characteristics and dynamics of regional growth (Solehuddin, 2023; Septiana & Salahudin, 2021).

Geographic Information System (GIS) is a system capable of collecting, storing, manipulating, analyzing, and presenting geographic information (Bipu, 2019; Dimanova, 2024; Mierzejowska & Żogała, 2018; Reddy, 2018). GIS plays a crucial role in spatial analysis across various fields, including education. One implementation of GIS in the education sector is school mapping (Suryani et al., 2012). The use of GIS in education provides insights into regional characteristics to determine spatially optimal school locations (Mustaffa et al., 2021). GIS integrates the physical conditions of an area, such as accessibility, land use, topography, proximity to hydrological features, and multi-hazard disaster vulnerability levels (Chan et al., 2022; Sakti et al., 2021), with the aim of planning sustainable school sites. Spatial analysis in school location planning utilizes GIS software, particularly ArcGIS. ArcGIS software offers various spatial features, such as overlay analysis, buffering, spatial distribution, and network analysis, which support a systematic school site planning process (Al Rawashdeh et al., 2025; Al-Enazi et al., 2016; Falih & Alyaqoobi, 2021). Furthermore, the ability of ArcGIS to manage and present spatial data facilitates the visualization of analysis results (Al-Enazi et al., 2016).

Land suitability analysis is an approach used to assess the degree of suitability of a land unit for a specific use, thereby supporting sustainable land utilization (Anusha et al., 2023; Arfiansyah et al., 2024). The assessment of land suitability is conducted by considering both the opportunities and constraints within a region (Mokarram & Aminzadeh, 2010). Furthermore, this assessment determines the level of suitability for a particular use by considering land characteristics alongside the requirements of the planned land use (Akıncı et al., 2013; Fazel Amiri & Shariff, 2012). Land suitability analysis supports multi-criteria decision-making processes that involve evaluating the relative importance of various factors (Akıncı et al., 2013). This analysis plays a vital role in public facility planning, including school site selection. It integrates various physical parameters to identify areas that are more suitable and have relatively low hazard potential. This process utilizes GIS to manage and analyze spatial data, allowing for the visualization and mapping of suitability across different locations (Listyono & Manessa, 2025; Mustaffa et al., 2021). Land suitability levels are determined using the weighted overlay method (Arfiansyah et al., 2024; Mustaffa et al., 2021). The weighted overlay method integrates various indicators by assigning weights to each based on its level of importance (Maulana & Kanai, 2021; Nor et al., 2024). This method is essential in GIS for combining multiple thematic map layers, resulting in a land suitability map that indicates feasibility levels ranging from highly suitable to unsuitable (Chowdary et al., 2023; Kadhim et al., 2023).

The determination of optimal school locations using GIS was previously conducted by Badriyah (2017), who emphasized the use of GIS to identify targeted sites for junior high school (SMP) construction to support equitable educational access, with key determinants including accessibility, environment, demographics, and capacity/distribution. Similarly, Djuraini et al. (2022) assessed the suitability of high school (SMA) locations in Gorontalo City using GIS-based overlay and scoring techniques in accordance with the Ministry of National Education Regulation No. 24 of 2007, identifying 3 highly suitable and 6 suitable schools. Furthermore, Renzi et al. (2025) applied GIS–MCDA to map the suitability of new primary school sites in Seremban, revealing that the most suitable areas tend to be located in the city center due to high population density and the availability of facilities.

Based on the findings of these studies, it is evident that previous research has generally demonstrated the effectiveness of GIS in identifying suitable school locations based on various spatial criteria. However, most prior studies tend to conclude only with a suitability map as the final output. This research integrates land suitability results with further analysis to provide recommendations for the future development of the education sector. Additionally, this study focuses on the context of the Nusantara Capital City (IKN), where existing research remains limited.

Methodology

This study employs a quantitative descriptive approach aimed at identifying and evaluating land suitability levels as a basis for school construction planning in the Nusantara Capital City (IKN). The method utilized is spatial analysis based on Geographic Information Systems (GIS) to assess land suitability across various physical and environmental parameters, including accessibility, slope inclination, land use, proximity to rivers, and potential disaster vulnerability. This analysis produces a spatial representation of areas suitable for school development to serve as a foundation for educational planning decision-making. This research was conducted in the Nusantara Capital City (IKN), East Kalimantan Province, which serves as the spatial study area for the land suitability analysis of school construction. The study took place from November 2025 to January 2026, utilizing secondary data analyzed through GIS-based spatial analysis without involving field surveys.

In this study, several research questions were formulated to guide the analytical process. These questions focus on assessing the level of land suitability for school construction in the Nusantara Capital City (IKN), analyzing the spatial distribution of suitable areas based on Geographic Information System (GIS) analysis, and identifying locations with the greatest potential to become priority areas for school development. Correspondingly, the objectives of this study are to evaluate the degree of land suitability for school construction in IKN, to examine the spatial patterns of suitable school locations using GIS-based analysis, and to generate spatial information in the form of land suitability maps that serve as a basis for planning and decision-making related to educational infrastructure development in the region.

The data utilized in this study are as follows (Table 1).

Table 1. Research Material

No.	Data Type	Data	Source
1	Data Spasial	Indonesian Topographic Map (RBI) scale 1:50,000	Source
2		National Digital Elevation Model (DEMNAS)	BIG
3		Road network data	DEMNAS
4		Land use thematic map	OpenStreetMap
5		Hydrological network map	BIG
6		Multi-hazard risk map	BIG
7		Nusantara Capital City Masterplan	BNPB

This study utilizes five parameters for land suitability analysis that represent the physical conditions of the IKN region. Each parameter was selected for its influence on location suitability and its relevance to the objectives of the land suitability analysis, making them essential to the overall evaluation process. The parameters used in this research are presented in Table 2.

Table 2. Land Suitability Parameters and Criteria

Parameter	Indicator	Classification	Score	Weight
Accessibility	Distance to Road	< 300m (Highly Suitable)	5	25%
		300 - 600 m (Suitable)	4	
		600 – 1.200 m (Moderately Suitable)	3	
		1.200 – 1.300 m (Marginally Suitable)	2	
		1.300 – 3.100 m (Unsuitable)	1	
Resources: (Peraturan Menteri Pekerjaan Umum No.20 Tahun 2011) , (Peraturan Menteri PUPR No.38/PRT/M/2015) , (Djuraini et al., 2022)				
Topography	Slope Inclination	0 - 8% (Highly Suitable)	5	15%
		8-15% (Suitable)	4	

		15-25% (Moderately Suitable)	3	
		25-40% (Marginally Suitable)	2	
		>40% (Unsuitable)	1	
Resources: (SNI 03-1733-2004), (Kementerian Pendidikan, 2017)				
Hydrology	Distance to River	>100m (Highly Suitable)	5	25%
		75-100m (Suitable)	4	
		50-75m (Moderately Suitable)	3	
		25-50m (Marginally Suitable)	2	
		≤25m (Unsuitable)	1	
Resources: (Kementerian Pekerjaan Umum dan Perumahan Rakyat, 2015)				
Land Use	Land Cover	Shrubland, Open Field (Highly Suitable)	5	20%
		Grassland, Settlements (Suitable)	4	
		Dryland Agriculture, Plantation Areas (Moderately Suitable)	3	
		Paddy Fields (Marginally Suitable)	2	
		Mangrove Forest (Unsuitable)	1	
Resources: (BIG, 2022), (Kementerian Pendidikan, 2017), (Djuraini et al., 2022)				

Disaster Risk	Multi-hazard	Very low (Highly Suitable)	5	20%
		Low (Suitable)	4	
		Moderate (Moderately Suitable)	3	
		High (Marginally Suitable)	2	
		Very High (Unsuitable)	1	
Resources: (BNPB, 2023), (Kementerian Pendidikan, 2017), (Djuraini et al., 2022)				
Demographics	Population Count	Very High (Highly Suitable)	5	20%
		High (Suitable)	4	
		Moderate (Moderately Suitable)	3	
		Low (Marginally Suitable)	2	
		Very Low (Unsuitable)	1	
Resources: (BPS, 2023), (Kementerian Pendidikan, 2017)				

This research consists of several analytical stages, including preprocessing, individual indicator analysis for land suitability, weighted overlay, and land suitability classification. The preprocessing stage is conducted to ensure the consistency and accuracy of the spatial data. This process includes georeferencing, aligning the coordinate systems to UTM Zone 50S, as well as digitization and geometric correction. This stage aims to minimize spatial errors before further analysis is performed.

Thus, the analysis phase involves five land suitability indicators: distance to roads, distance to rivers, slope inclination, land cover, multi-hazard disaster vulnerability and population. The indicators for distance to roads and rivers are analyzed using the Euclidean Distance feature. Slope inclination is derived from DEM data through slope analysis. Furthermore, land cover and multi-hazard disaster vulnerability indicators are analyzed based on their respective thematic maps, which represent the characteristics of the IKN region. Each indicator is then reclassified based on land suitability classifications and assigned a score from 1 to 5, according to its level of influence on land suitability. Population data were derived from the minimum and maximum population estimates in the Nusantara Capital City (IKN)."

All indicators are further analyzed using the weighted overlay method. Each indicator is processed by multiplying its weight and score as expressed in Equation 1 (suitability score). The assignment of scores and weights for each indicator refers to Table 2. The score represents the suitability level of each indicator class, while the weight reflects the relative importance of each indicator in the land suitability analysis.

$$\text{Suitability Score} = \Sigma (W_i \times S_i) \ .... (1)$$

Notes:

W_i = weight of the i-th parameter

S_i = score of the i-th parameter

The resulting land suitability values are then categorized into five classes. These land suitability classes consist of highly suitable, suitable, moderately suitable, marginally suitable, and unsuitable. The results of this classification will be used to determine priority areas for school construction in IKN. The research workflow in this study is systematically structured to illustrate the execution stages, from the literature review to the validation of the analysis results. This workflow is presented in the flowchart in Figure 1.

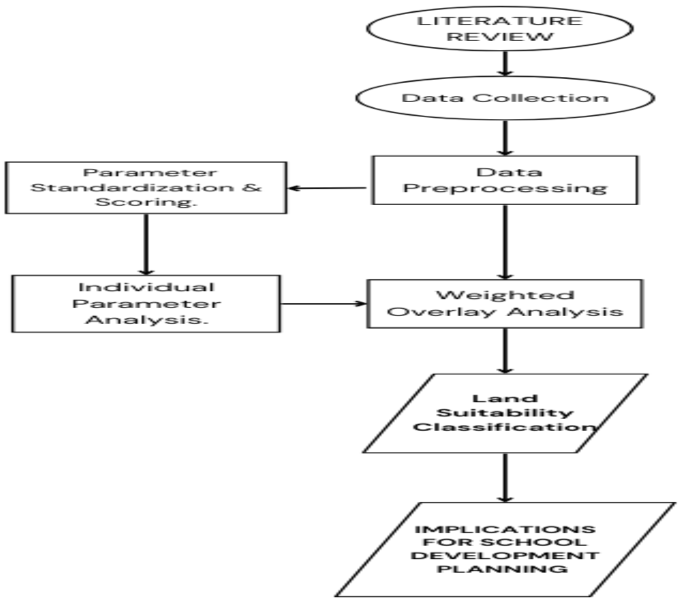


Figure 1. Research Flowchart

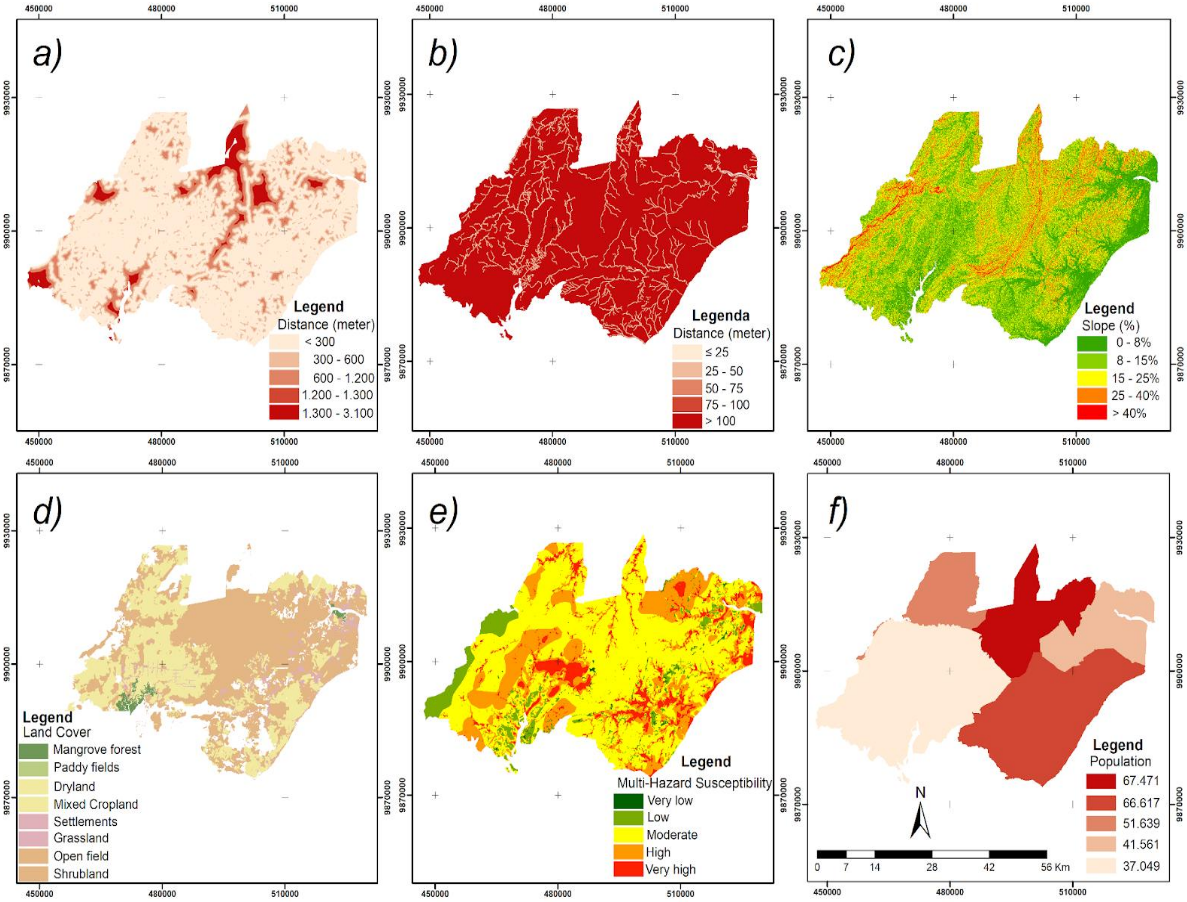
Result And Discussion

Legally, the Nusantara Capital City (IKN) is a special regional government unit at the provincial level. The law defines IKN as "a special regional government unit at the provincial level" (Law of the Republic of Indonesia Number 3 of 2022, Article 1). Geographically, IKN is situated between the city of Balikpapan to the north and Samarinda to the south, providing strategic access to the Indonesian Archipelago Sea Lane (ALKI) II (Kalalinggi et al., 2022). Located in East Kalimantan, IKN covers a land area of approximately ±256,142 hectares and a marine area of ±68,189 hectares, administratively spanning across Penajam Paser Utara and Kutai Kartanegara Regencies.

The area is divided into three main zones: the IKN Development Zone (KP-IKN) covering ±199,962 hectares, the IKN Zone (K-IKN) at ±56,180 hectares, and the Government Center Core Area (KIPP) at ±6,671 hectares (Bappenas, 2021). The topography of IKN varies from lowlands to hilly terrain, with tropical rainforest as the dominant land cover. According to a study by the Ministry of Environment and Forestry (KLHK, 2019), this region possesses an ecosystem rich in biodiversity, including flora and fauna endemic to Kalimantan. Geologically, the area is relatively stable with a low risk of earthquakes; however, it requires sophisticated drainage planning to mitigate flooding caused by high rainfall (Bappenas, 2020).

Socially, the IKN region is inhabited by a heterogeneous population, including indigenous groups such as the Dayak, Kutai, and Banjar, as well as migrants from various regions. Economically, the development of IKN is expected to serve as a catalyst for growth in eastern Indonesia and a driver for transforming from a Java-centric to an Indonesia-centric economy (Bappenas, 2021). The development phase of IKN from 2025 to 2045 is directed toward establishing a resilient core area, completing the relocation of the central government, and strengthening innovation hubs and priority economic sectors through incentives aligned with the SDGs. Subsequent stages emphasize the enhancement of infrastructure and the "Three Cities" ecosystem, the development of sustainable utilities based on a circular economy and increasing investment attractiveness and talent development to establish IKN as a premier destination in Indonesia and Southeast Asia (IKN Authority, n.d.).

The planning of school construction in IKN utilizes GIS-based land suitability analysis focusing on physical aspects through five indicators. The analysis results show the spatial distribution of each indicator, distance to roads, distance to rivers, slope inclination, land cover, and multi-hazard disaster vulnerability (Figure 2), which are categorized into five classes. The mapping of each indicator aims to identify the characteristics of the IKN region, serving as the basis for determining the most suitable areas for school development.



Resources: Data Processing (2026)

Figure 2. Result of land suitability indicator analysis (a) Distance to Roads (b) Distance to Rivers (c) Slope (d) Land Cover (e) Multi-Hazard Susceptibility (f) Population

a) Road Network Accessibility

The distance-to-road indicator is used to measure the level of accessibility for school locations. The analysis results **(Table 3)** show that an area of 1,864.4 km², or approximately 73.52% of the total study area, falls into the "highly suitable" class, with a radius of less than 300 meters from main roads. This indicates that most of the region possesses good accessibility potential to support the efficient mobility of both students and educators.

Table 3. Analysis results for the distance-to-road indicator

Class	Area (km^2)	Percentage (%)
< 300m	1.864,4	73,52
300 - 600 m	350,4	13,82
600 – 1.200 m	206,4	8,14
1.200 – 1.300 m	17,1	0,67
1.300 – 3.100 m	97,6	3,85

Resources: Data Processing (2026)

b) Proximity to Rivers

The distance-to-river indicator is used to identify areas far from potential river overflows and to comply with river buffer zone regulations stipulated in the Ministry of PUPR Regulation No. 28/PRT/M/2015 regarding the Establishment of River and Lake Buffer Lines. Based on the proximity analysis, areas outside the river buffer zone dominate the study region within the "highly suitable" class (radius >100m), covering an area of 136.4 km² (31.06%). This indicates the availability of suitable land that can minimize environmental impact risks.

Table 4. Analysis results of the distance to river indicator

Class	Area (km^2)	Percentage (%)
>100m	136,4	31,06
75-100m	71	17,56
50-75m	73,1	16,65
25-50m	75,3	17,16
≤25m	77,1	17,57

Resources: Data Processing (2026)

Class	Population	Sub-district
Very High	67.471	Loa Janan
High	66.617	Samboja
Moderate	51.639	Loa Kulu

Low	41.561	Muara Jawa
Very Low	37.049	Sepaku

Resources: Data Processing (2026)

c) Slope Inclination

The slope inclination analysis is conducted to identify the suitability of the topography for the construction of educational facilities. Based on the analysis of this indicator, the slope classification is dominated by "gentle slopes" (8-15%), covering 729.5 km² or approximately 28.74% of the total area. Areas with "flat" slopes cover 717.6 km². Flat slope classes are categorized as "highly suitable," representing the second-largest proportion of the area and thus holding significant potential for school development. Furthermore, the "moderately steep," "steep," and "very steep" slope classes cover 681.5 km², 345.7 km², and 64.23 km², respectively. Regions with gentle slopes offer relatively stable land conditions, making them suitable for planned school locations and facilitating the construction process and accessibility.

Table 5. Slope Inclination Analysis Results

Class	**Area (km^2)**	**Percentage (%)**
0 - 8% (Flat)	717,6	28,27
8-15% (Gentle)	729,5	28,74
15-25% (Moderately Sleep)	681,5	26,85
25-40% (Steep)	345,7	13,62
>40% (Very Steep)	64,23	2,53

Resources: Data Processing (2026)

d) Land Cover

Based on the land cover indicator, the "open land" and "shrubland" classes represent the highest percentage, covering 1,106.4 km² or approximately 58.98% of the total IKN area. This class is categorized as "highly suitable" for school construction. The land cover class with the second-largest area consists of "dry fields" and "plantations/gardens." This category is classified as "moderately suitable," with a total area of 669.2 km². Land in the "moderately suitable" class requires careful management and land-use adjustments to avoid disrupting existing economic and environmental functions.

Table 6. Land Cover Analysis Results

Class	Area (km^2)	Percentage (%)
Shrubland, Open Land (Vacant Land)	1.106,4	58,98
Grassland, Settlements, and Activity Areas	73,9	3,94
Dry Fields, Plantations/Gardens	669,2	35,66
Rice Fields	0,6	0,03

e) Multi-hazard Disaster Vulnerability

The multi-hazard disaster vulnerability indicator consists of five vulnerability classes. The majority of the region falls into the "moderate vulnerability" class, covering an area of 1,452.7 km² or approximately 57.17% of the total area. This class is categorized as "moderately suitable" for land use. Although classified as "moderately suitable," school development planning in areas with moderate disaster vulnerability must incorporate both structural and non-structural disaster mitigation strategies.

Table 7. Multi-hazard Disaster Vulnerability Analysis Results

Class	Area (km^2)	Percentage (%)
Very Low	13,5	0,53
Low	194,8	7,67
Moderate	1.452,7	57,17
High	642,3	25,28
Very High	237,6	9,35

Resources: Data Processing (2026)

f) Population Count

Based on the population indicator, the sub-district with the highest population is Loa Janan, with a total of 67,471 residents, followed by Samboja with 66,617 residents. Sepaku Sub-district has the lowest population, totaling 37,049 residents. A higher population in a specific area indicates a higher potential for suitability as a site for school construction.

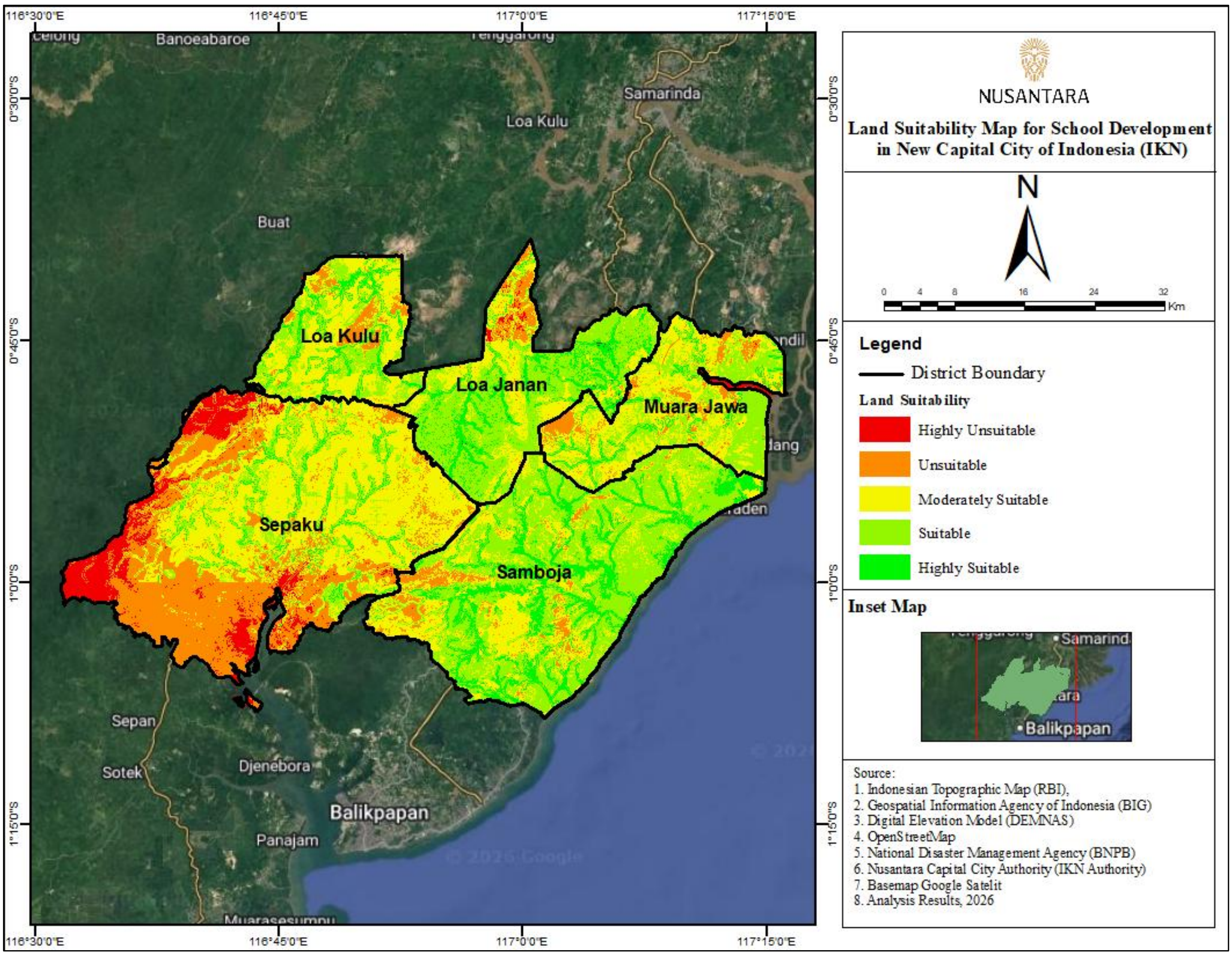
Table 8. Population Count Indicator Analysis Results

Class	Population	Sub-district
Very High	67.471	Loa Janan
High	66.617	Samboja

Moderate	51.639	Loa Kulu
Low	41.561	Muara Jawa
Very Low	37.049	Sepaku

Resources: Data Processing (2026)

g) Land Suitability Analysis Results



Resources: Data Processing (2026)

Figure 3. Land Suitability Map for School Constructio

Table 9. Distribution of Land Suitability Classes by Area

Class	**Area (km²)**	**Percentage (%)**	**Location Dominant**
Highly Suitable	717.625608	28.27	Samboja, Loa Janan
Suitable	729.445211	28.74	Loa Kulu
Moderately Suitable	681.459369	26.85	Muara Jawa, Sepaku

Marginally Suitable	345.702811	13.62	Sepaku
Unsuitable	64.232783	2.53	Sepaku

Based on the results presented in Figure X and Table 2, five classes of land suitability for school construction were identified. The "Highly Suitable" class is predominantly located in the Samboja and Loa Janan sub-districts. The "Suitable" class is mainly found in Loa Kulu, while the "Moderately Suitable" class is concentrated in Muara Jawa. Conversely, the "Unsuitable" and "Highly Unsuitable" classes are predominantly located in the Sepaku sub-district.

Samboja and Loa Janan are the primary sub-districts most suitable for school development. Based on the parameters tested, Samboja is strategically positioned with a distance of less than 300 meters from main roads and remains at a safe distance from rivers (more than 100 meters). Furthermore, this sub-district is dominated by gentle slopes ranging from 0% to 15%. According to SNI 03-1733-2004, assuming slope requirements are aligned with residential land-use standards; this condition is considered highly suitable. Loa Janan shares similar favorable conditions; however, its northern section contains areas far from main roads, which should not be prioritized for educational facility development. In general, school locations with easier access are considered more suitable, as they must be supported by road networks and transportation modes that enable student accessibility and pick-up/drop-off operations (Queensland Department of Education, 2023).

Regarding land cover, both Samboja and Loa Janan are dominated by open fields and shrubland, providing adequate space for construction. In terms of multi-hazard vulnerability, both sub-districts fall into the "moderate vulnerability" category. This condition remains sufficiently suitable for educational facilities, provided that robust mitigation planning is implemented to minimize existing risks. From a social perspective, represented by the population parameter, Samboja has 66,617 residents and Loa Janan has 67,471, making them the most populated sub-districts in the study area. A larger population indicates a higher demand for educational facilities, including schools. The National Standardization Agency (2004) states that the planning of educational facilities must consider the number of children requiring such services. This principle aligns with school site planning guidelines that emphasize the correlation between school distribution and the population served (Gould, 1978).

Based on these land suitability results, several implications for school development planning in the Nusantara Capital City (IKN) can be formulated. Samboja and Loa Janan should be considered priority areas for school construction due to their favorable physical and social conditions. However, school development in northern Loa Janan should be restricted due to limited accessibility. Meanwhile, Loa Kulu and Muara Jawa, which are categorized as "Suitable" and "Moderately Suitable," require improvements in supporting infrastructure, particularly road networks and transportation systems, to enhance their suitability for educational facilities. For areas classified as "Marginally Suitable" or "Unsuitable," such as Sepaku, a more adaptive planning approach is required, such as the construction of small-scale schools or the development of alternative educational service models tailored to the local geography. Furthermore, since the multi-hazard vulnerability level in several priority areas is moderate, disaster mitigation aspects must be integrated from the planning stage through to the design and construction of school buildings to ensure safety and the long-term sustainability of educational facilities.

Conclusion

This study demonstrates that a Geographic Information System (GIS), based land suitability analysis can be effectively utilized as a foundation for school construction planning in the Nusantara Capital City (IKN). Based on the spatial analysis of road network accessibility, proximity to rivers, slope inclination, land use, multi-hazard disaster vulnerability, and demographic characteristics, the study area is classified into five land suitability classes: highly suitable, suitable, moderately suitable, marginally suitable, and unsuitable.

The results indicate that the Samboja and Loa Janan sub-districts possess relatively high levels of land suitability for school development, supported by gentle terrain, good accessibility, available open land, and relatively large populations. The Loa Kulu and Muara Jawa sub-districts fall into the moderate suitability category, suggesting potential for school development if supported by improvements in infrastructure. Meanwhile, the Sepaku sub-district is dominated by low to unsuitable classes, indicating a need for caution in planning educational facilities in that area. Overall, this research provides a land suitability map and guidelines for school development zones that can serve as an initial spatial framework for educational planning in IKN. These findings reaffirm that selecting school locations based on physical, environmental, and social characteristics is vital for supporting targeted and sustainable educational development in the new capital.

Based on the research findings, it is recommended that the resulting land suitability map be used as an initial reference for determining school construction sites in IKN, prioritizing areas in the "highly suitable" and "suitable" categories. These results can also serve as supporting data for the preparation and alignment of regional planning documents, such as the Regional Spatial Plan (RTRW) and the Regional Medium-Term Development Plan (RPJMD), to ensure a more directed and efficient distribution of educational facilities. Furthermore, for areas with moderate to low suitability, a more adaptive planning approach is required, including infrastructure upgrades, school design adjustments, and the implementation of disaster mitigation strategies tailored to regional characteristics. For future research, it is suggested that the land suitability analysis be enhanced with primary data from field surveys and additional socio-economic and institutional parameters to ensure more comprehensive school development planning in IKN.

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