Implementation of Green Building Concept in High Rise Developments Through Appropriate Site Development (ASD)

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ABSTRACT

This study evaluates the implementation of green building criteria based on Appropriate Site Development (ASD) in the Jakarta State University Postgraduate Building. Using the Greenship assessment tool from the Indonesian Green Building Council (GBCI), the analysis focuses on ASD, which includes prerequisite and credit criteria. The building scored 8 out of 17 points, indicating partial compliance with ASD standards. Notable strengths include the Microclimate criterion, where all requirements were met. However, critical shortcomings were identified in Rainwater Management, which scored zero, reflecting unmet criteria. Similar issues were observed in Bicycle User Facilities and Site Landscape, which also received zero scores. Public transportation access was another area requiring improvement to support user mobility. Challenges in implementing the Green Building concept include limited land availability and high initial costs for environmentally friendly technologies. To address these issues, the study recommends enhancing land management by increasing green spaces, adding facilities for cyclists and eco-friendly vehicles, and involving the community in sustainability initiatives. These findings highlight areas for improvement and provide a framework for the sustainable development of educational buildings. This research aims to contribute to broader efforts in promoting green building practices within the education sector.

Keywords: Green Building Implementation, Feasible Site Development, Postgraduate Building, Jakarta State University, Greenship Criteria.

1. INTRODUCTION

The green building concept has become one of the main approaches to supporting sustainable development. With increasing awareness of the negative impacts of development on the environment, green buildings offer solutions to minimize carbon footprints, increase energy efficiency, and create a healthier environment. In this context, the Green Building Concept can be proposed as a solution to mitigate environmental degradation [1]. The Green Building Concept not only contributes to reducing environmental damage but also offers three main benefits, namely increasing building asset value, reducing building operational costs, and enhancing the comfort and health of building occupants [2].

The concept of environmental sustainability has gained attention in Indonesia only in recent years. Fundamentally, this concept derives from the principle of sustainability, emphasizing the ability of natural resources to interact with human cultural, social, and economic systems. Additionally, it involves the capacity to adapt to inevitable environmental changes over time. [3] The Indonesian government is currently prioritizing efforts to enhance infrastructure development. Various projects are being expanded, including the construction of irrigation systems, highways, public facilities, and housing for the community. However, such development also brings negative impacts, such as increased waste, air pollution, reduced water absorption areas, and diminishing green open spaces. These effects contribute to global warming. Therefore, it is crucial for the public, especially construction industry players, to be more aware and prioritize environmentally friendly development practices. [4]

Indonesia has an institution dedicated to creating a healthier and more sustainable environment called the Green Building Council Indonesia (GBCI). This organization consists of professionals from various fields such as construction, the building and property industry, government, academia, and environmentally conscious communities. GBCI has developed an assessment program called Greenship, designed to evaluate whether a building qualifies as a "green building." Supported by the World Green Building Council and implemented by GBCI's Rating Commission, this system awards points based on met criteria, determining the building's certification level. [5] The Greenship rating program is expected to assist the central and local governments in promoting the implementation of green building concepts through permitting mechanisms or incentive programs. Additionally, the developed system can be utilized by accredited inspection agencies as a basis for certifying green buildings. [6]

There are six key criteria for green buildings according to the Green Building Council that can be applied in architectural design. These criteria include Efficient Land Use, Energy Efficiency and Conservation, Water Management and Conservation, Sustainable Material Utilization, Indoor Air Quality and Comfort, and Building Environmental Management. Implementing these principles enables more sustainable building designs without compromising the surrounding environmental quality. [7] In other research, Targeted interventions are required to address key criteria in sustainable building assessments, including the mitigation of private vehicle dependency, the integration of pedestrian-friendly infrastructure, and the strategic selection of flora species capable of supporting urban biodiversity by attracting non-domesticated fauna. These efforts are essential to meet the threshold scores established within green building rating systems [8]

Appropriate Site Development (ASD) is one of the Greenship criteria aimed at maintaining or expanding urban green spaces to improve microclimate quality, reduce CO2 and other pollutants, prevent soil erosion, decrease the load on drainage systems, and maintain the balance between clean water and groundwater systems. [9] Appropriate Site Development (ASD) includes criteria for building accessibility, reducing motor vehicle use, optimizing green spaces to mitigate the heat island effect and rainwater runoff, and preserving ecosystems through land management. [10] This aspect is closely linked to land development and is essential in building planning due to the environmental impacts that a structure may generate. The better the site development, the lower the potential negative effects on the surroundings. Additionally, well-developed infrastructure and facilities enhance accessibility and contribute to improved energy efficiency [11]. In previous research, it was proven that the design of building envelopes with glass material was proven to consume high electrical energy so that conditions like this make a big contribution to global warming [12]

The Postgraduate Building of the State University of Jakarta (UNJ) was chosen as a case study because it has great potential to be optimized according to green building principles. As an educational facility that supports advanced academic activities, this building requires efficient land management to meet user needs while maintaining environmental sustainability aspects. This study aims to analyze appropriate site development in applying the green building concept in the UNJ Postgraduate Building so that it can be a reference for the development of other educational buildings. To achieve this, a qualitative descriptive method is used, involving direct observation and document analysis based on the national green building rating system. The expected outcome of this study is a set of practical recommendations for environmentally responsible site development that can be applied to similar educational facilities.

2. METHODOLOGY

This research was conducted with data collection analysis to meet the green ship rating tools by the Green Building Council Indonesia (GBCI) which focus on the category of "Appropriate Site Development" (ASD), where in that category there are two criteria, namely prerequisites criteria and credit criteria. After the analysis data is collected, it is continued with the assessment system method that refers to the provisions of GBCI. This system functions as a mechanism composed of various elements related to the aspects being assessed, which are referred to as assessment categories, where each category is given a certain weight or point value. If a building successfully enters an assessment category, then the building will receive the appropriate points. If the total points collected through the application of this system meet the predetermined threshold, then the building can be classified into a certain assessment level. [13] The implementation of this analysis is described as follows.

2.1 Prerequisite Criteria

Prerequisite criteria refer to the fundamental requirements in every category that must be fulfilled before proceeding with the evaluation based on credit and bonus criteria. These criteria establish the minimum standard for a building to be environmentally friendly. If any prerequisite criteria are not met, the credit and bonus criteria assessment across all categories cannot be conducted. Unlike other criteria, prerequisite criteria do not have specific evaluation scores but remain essential requirements. [14] Prerequisite criteria includes 2 criteria, each of which has its objectives and benchmarks for success, namely as follows.

2.1.1 ASD P1 (Site Management Policy)

A statement letter from top management committing to the maintenance of the building's exterior, integrated pest management (IPM), weed control, and the management of the surrounding habitat using non-toxic materials.

2.1.2 ASD P2 (Motor Vehicle Reduction Policy)

A statement letter outlines the top management's commitment to implementing various measures to reduce the use of private motor vehicles, including carpooling, feeder buses, public transportation vouchers, and parking fee discrimination. Additionally, a campaign promoting the reduction of private vehicle use is being carried out, featuring permanent written materials on each floor, such as stickers, posters, and emails.

2.2 Credit Criteria

Credit criteria refer to a set of requirements within each evaluation category that are not mandatory to fulfill. The fulfillment of these criteria is adjusted based on the building's specific capabilities and conditions. If a building meets the criteria, it will receive points according to the assigned weight. Conversely, if the criteria are not met, the building will not earn points for that category. [14]

2.2.1 ASD 1 (Site Selection)

Goal: To prevent construction on greenfield areas and avoid clearing the new land.

Benchmarks:
1. A development area qualifies for this benchmark if it possesses at least eight out of twelve specified types of urban infrastructure and public facilities. (1 point)
   Or
   The area may qualify if it has a Floor Area Ratio (FAR) exceeding 3. (1 point)
2. Points are awarded for the revitalization and redevelopment of lands previously deemed unproductive due to prior construction activities or adverse impacts from earlier development. (1 point)

2.2.2 ASD 2 (Community Accessibility)

Goal: To promote development in areas with established connectivity networks and enhance building utilization, making it easier for the community to carry out daily activities while reducing the reliance on motor vehicles.

Benchmarks:
1. At least 7 types of public facilities must be available within 1500 meters of the site, accessible from the main road. (1 point)
2. Ensure pedestrian access, in addition to the main street outside the site, connecting to secondary roads and/or properties owned by others, with access to at least three public facilities within a 300-meter walking distance. (1 point)
3. Provide safe and comfortable pedestrian facilities, separated from motor vehicle traffic, linking at least 3 of the public facilities above and/or the mass transit station. (2 points)
4. The ground floor of the building must be open to provide safe and comfortable pedestrian access for at least 10 hours a day. (2 points)

2.2.3 ASD 3 (Public Transportation)

Goal: Encourage building occupants to use public transportation and reduce the use of private vehicles.

Benchmarks:
1. A public transportation stops or station is within a 300-meter walking distance from the building's entrance, excluding the length of pedestrian bridges and ramps. (1 point)
   Or
   Provide a shuttle bus service for building occupants, with a minimum number of units covering 10% of the building's regular users. (1 point)
2. Provide pedestrian pathways within the building area that lead to the nearest public transportation station, ensuring safety and comfort in compliance with the Ministry of Public Works Regulation No. 30/PRT/M/2006 on Technical Guidelines for Facilities and Accessibility in Buildings and Surrounding Environments, Annex 2B. [8] (1 point)

2.2.4 ASD 4 (Bicycle User Facilities)

Goal: Encouraging building users to cycle by providing adequate facilities, thereby reducing the use of motor vehicles.

Benchmarks:
1. The provision of secure bicycle parking, with 1 parking space per 20 permanent building users, up to a maximum of 100 bicycle parking spaces. (1 Point)
2. If the first benchmark is met, a shower unit must be provided for every 10 bicycle parking spaces. (1 point)

2.2.5 ASD 5 (Site Landscaping)

Goal: Maintaining or expanding urban greenery to enhance microclimate quality, reduce CO2 and pollutants, prevent soil erosion, ease the burden on drainage systems, and preserve the balance of clean water resources and groundwater systems.

Benchmarks:
1. A landscape area consisting of vegetation (softscape) free from hardscape garden structures, located above the ground surface, covering at least 40% of the total land area. The area to be considered includes those mentioned in Prerequisite 1, gardens above basements, roof gardens, terrace gardens, and wall gardens, in accordance with Minister of Public Works Regulation No. 5/PRT/M/2008 on Green Open Space (RTH), Article 2.3.1 regarding Vegetation Criteria for Yards. [15] (1 Point)
2. If Benchmark 1 is met, an additional 1 point is awarded for every 5% increase in landscape area of the total land area. (1 Point)
3. The use of plants that have been locally cultivated at the provincial scale, covering 60% of the mature canopy area relative to the landscape area in ASD 5 Benchmark 1. (1 point)

2.2.6 ASD 6 (Microclimate)

Goal: Improving the quality of the microclimate around the building, including the comfort of its occupants and the surrounding habitat.

Benchmarks:
1. Using various materials to prevent the heat island effect on the building's roof area, ensuring that the albedo value (solar heat reflection capacity) is at least 0.3, as calculated. (1 point)
   Or
   Incorporating a green roof covering 50% of the roof area not used for mechanical and electrical (ME) purposes, based on the canopy area. (1 point)
2. Using various materials to avoid the heat island effect on non-roof pavement areas, ensuring that the albedo value (solar heat reflection capacity) is at least 0.3, as calculated. (1 point)
3. The landscape design, featuring vegetation (softscape) along the main pedestrian circulation, provides protection from heat caused by solar radiation. (1 point)
   Or
   The landscape design, featuring vegetation (softscape) along the main pedestrian circulation, offers protection from strong winds. (1 point)

The procedure for calculating the albedo value (solar heat reflection power) can be done using the Equation (1), where An is the Albedo value of material n and Ln is the Area of material n.

$$\frac{\sum(An \times Ln)}{\sum Ln} \qquad (1)$$

2.2.7 ASD 7 (Storm Water Management)

Goal: Reduce the burden on the local drainage system by managing rainwater runoff through an integrated stormwater management system.

Benchmarks:
1. Reduction of the rainwater runoff volume load on the city drainage system from the building site by 50%, calculated using a rainfall intensity value of 50 mm/day. (1 point)
   Or
   Reduction of the rainwater runoff volume load on the city drainage system from the building site by 85%, calculated using a rainfall intensity value of 50 mm/day. (2 points)
2. Demonstrating efforts to manage the reduction of flood load from the surrounding area outside the building site. (1 point)
3. Implementing technologies that can reduce rainwater runoff discharge. (1 point)

The procedure for calculating the volume of groundwater flow can be carried out using the Equation (2). In Equation (2), the soil absorption coefficient in infiltration wells was set to be 0.855. In Equation (2), Vab refers to volume of the flood contribution to the infiltration well (m^3), $C\ catch$ refers to coefficient of runoff from the plane, $A\ catch$ is the area of the field of candidate, R is the average daily rain height (L/ m^2/ day)

$$Vab = 0.855 \times C\ catch \times A\ catch \times \frac{R}{1000} \qquad (2)$$

3. RESULTS AND DISSCUSION

This section presents the analysis of the Postgraduate Building of Jakarta State University (UNJ) based on national green building rating standards. It begins with the prerequisite criteria, which assess the building's basic compliance with site management policies essential to green building practices. Field observations and document reviews were conducted to evaluate existing policies and initiatives.

3.1 Prerequisite Criteria

In the prerequisite criteria section, it will produce output in the form of analysis results at the Postgraduate Building of Jakarta State University which includes 2 criteria as follow.

3.1.1 ASD P1 (Site Management Policy)

This criterion was not met because there was no written statement containing a commitment from top management regarding exterior building maintenance, integrated pest management (IPM), and weed and surrounding habitat management using environmentally safe materials.

3.1.2 ASD P2 (Motor Vehicle Reduction Policy)

In this building, there has been no action to reduce the use of private motor vehicles with a written campaign. But the effort was made by making posters about the appeal to reduce the use of private motor vehicles so that this criterion is met. Furthermore, Table 1 that show recapitulation of the points resulting from the analysis of the ASD prerequisite criteria at the Postgraduate Building of State Jakarta University. According to Table 1, criteria within the Prerequisite Criteria are not met. Nevertheless, this research proceeds because the survey was conducted solely for research purposes, not for green building certification from GBCI

Table 1. Recapitulation table of points from the analysis of prerequisite criteria

Code	Criteria	Number	Benchmark	Fulfill		Index
				Yes	No	
ASD P1	Site Management Policy	-	P	-	✓	-
ASD P2	Motor Vehicle Reduction Policy	-	P	✓	-	-

3.2 Credit Criteria

The following are the results of the credit criteria survey in the analysis of the ASD Postgraduate Building, Jakarta State University:

3.2.1 ASD 1 (Site Selection)

Based on the RDTR zoning map, it was found that the zone in the Postgraduate Building of Jakarta State University has a KLB value of 5. This exceeds the minimum KLB value of >3, so this criterion is met and gets 1 point. Figure 1 shows the KLB value of the Jakarta State University area based on the RDTR zoning map.

Figure 1. KLB value of the Jakarta State University area based on the RDTR zoning map

This criterion is met because the construction of the Jakarta State University Postgraduate Building was carried out on an unused area due to former development or negative impacts of development. This criterion gets 1 point.

3.2.2 ASD 2 (Community Accessibility)

The first criterion is met because there are more than 7 types of public facilities in the Postgraduate Building of Jakarta State University within a distance of 1500 m from the main road, namely: Bank, Public Park, Roadside stall, Multipurpose Building, Security Post, Place of Worship, Canteen, Public Photocopy, Health Facilities, Fire Department, Public Transportation Station, Library, Sports fields, and Child Care Facilities. This criterion gets 1 point. Figure 2 shows several types of public facilities in the Postgraduate Building of Jakarta State University within a distance of 1500 m from the main road.

(a) (b) (c)

Figure 2. Several types of public facilities in the Postgraduate Building of Jakarta State University within a distance of 1500 m from the main road

There is no pedestrian access other than to the main road outside the site which connects it to the secondary road leading to public facilities, therefore the second criterion is not met so it does not get points. There is safe, comfortable, and free access from intersections with motorized vehicle access that connects directly to other buildings, and several public facilities are available, including a canteen, Shop, Public Photocopy, and Place of Worship, then the third criterion gets 2 points. The ground floor of the Postgraduate Building of Jakarta State University is always open for 11 hours a day so that pedestrians can access it, then the last criterion of ASD 2 gets 2 points.

3.2.3 ASD 3 (Public Transportation)

Based on the survey, the distance from the Postgraduate Building of Jakarta State University to the bus stop or public transportation station is 450 meters, this does not meet the requirements of this criterion where the distance from the gate of the building location to the bus stop or public transportation station must be within 300 m. So, this criterion does not get points. Below is figure 3 that shows the distance from building to nearest public transportation stop.

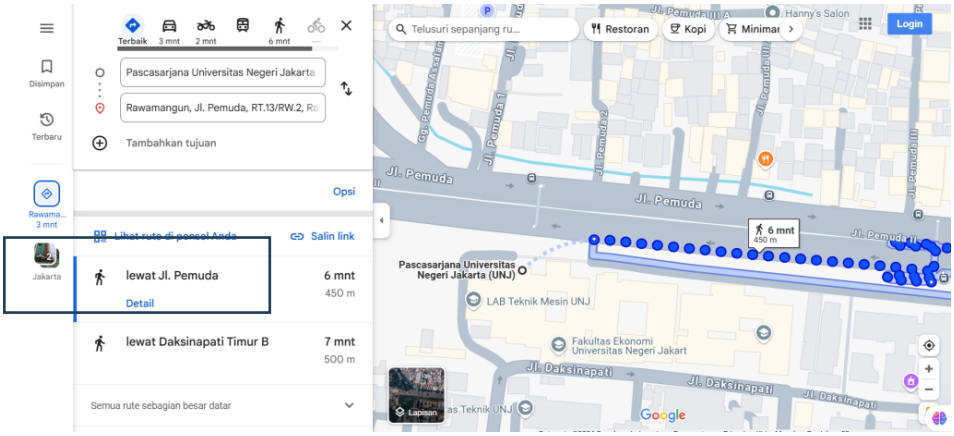

Figure 3. Distance from building to nearest public transportation stop

There are pedestrian path facilities in the building area to go to the nearest public transportation station and in accordance with the regulation of the Minister of Public Works Number 30/PRT/M/2006 regulating technical guidelines for facilities and accessibility in

building structures and the environment, where these facilities meet accessibility requirements for everyone, including the disabled and the elderly. [16] This criterion gets 1 point.

3.2.4 ASD 4 (Bicycle User Facilities)

There is no parking space for bicycle users in the building area, so this criteria does not get points. The second criterion is also not met because reviewing the survey results on the first criterion that there is no bicycle parking in the building area. So this criterion does not get points.

3.2.5 ASD 5 (Site Landscaping)

The main campus of Jakarta State University which is the location of the Jakarta State University Postgraduate building has an open space area of 27,834 m², and only has a green open space of ±3,000 m² or around 3% of the total area of 115,761 m² and the rest is still non-green open space**.** [17] From this value, it can be concluded that this criterion is not met because there is no open area with vegetation (softspace) that is free from garden buildings (hardscape) and is above ground level covering at least 40% of the total land area. So the first criterion does not get points. Based on the first criteria, this second criterion is also not met so it does not get points. The third criterion of ASD 5 is also not met, because there is no landscape area as described in the first criterion. So this criterion does not get points.

3.2.6 ASD 6 (Microclimate)

The results of this criteria survey are based on the calculation of albedo values and field surveys. Based on the measurement results, the area of paving landscape material located at the front of the building is 232.78 m^2 and the back of the building is 118.05 m^2 (*Figure 5*). So the total area of paving landscape material is 350.83 m^2 which is the Ln value of paving material in the albedo calculation formula. For green vegetation landscape material, the Ln value is 115.09 m^2 (*Figure 5*). Where the area is located at the front of the building. The An value in the albedo calculation formula is a coefficient value according to the landscape material, the An value for paving material is 0.25, while for green vegetation material the coefficient value is 0.40. The following is a table of values for each variable in the albedo calculation based on its landscape material. Table 2 shows the variable values in albedo calculations.

Table 2. Variable values in albedo calculations

Landscape Material	Ln (m^2)	Coefficient	Value
Paving	350.83	0.40	140.332
Green Vegetation	115.09	0.25	28.7724
Total	465.92		169.1045

$$\frac{\sum(An \times Ln)}{\sum Ln} = \frac{\sum(169.1045)}{465.92} = 0.36$$

The first criterion assesses the use of materials with an average albedo value of at least 0.3 according to the calculation of the roof area of the building covered by pavement, the results obtained according to the calculation above using Equation (1) are 0.36, so this criterion is met and gets 1 point. The second criterion assesses the use of materials with an average albedo value of at least 0.3 according to calculations on non-roof areas covered by pavement, the result obtained is 0.36, therefore the second criterion gets a value of 1 point. Based on a field survey, the landscape design in the form of vegetation (softscape) on the main pedestrian circulation shows that there is protection from heat due to solar radiation, so this criterion is met and gets 1 point.

3.2.7 ASD 7 (Storm Water Management)

Referring to the Indonesian National Standard (SNI) 03-2453-2002 on Guidelines for Planning Rainwater Infiltration Wells for Yard Areas, Equation (2) was used to calculate Vab. With daily maximum rainfall data of 20.29 mm/day (BMKG, 2010), Table 3 shows the calculation of runoff volume. Furthermore, there is a lack of adequate efforts and technologies to reduce the rainfall runoff into the drainage system, resulting in the stormwater management at the Postgraduate Building of Jakarta State University not meeting the required benchmark.

Table 3. Rainwater runoff calculation variable value

	Area (m^2)	Coef	Vab (m^3)
Roof			
Clay/ceramic roof tiles	1022.87	0.95	16.857
Landscape			
Paving	350.83	0.7	4.260
Front garden (grass)	115.09	0.21	0.420
Vab Total			21.527

Table 4 shows the results of the points obtained from the survey conducted at the Postgraduate School Building, Jakarta State University. Based on the point acquisition results for the ASD credit criteria, it can be concluded that the Postgraduate Building of Universitas Negeri Jakarta has largely met the ASD credit criteria, achieving an index of 8 points. The most outstanding criterion is Microclimate, as all its requirements have been fulfilled. On the other hand, the Postgraduate Building needs to pay more attention to the stormwater management criterion, as it scored no points, indicating that none of the requirements for this criterion have been met. This issue serves as a critical note for the management or authorities responsible for the building to address these two aspects, aiming to enhance its qualification as a green building.

Table 4. Recapitulation of credit criteria points obtained

Code	Criteria	Number	Maksimum Point	Fulfill		Points Total
				Yes	No	
ASD 1	Site Selection	1	1	✓	-	2
		2	1	✓	-	
ASD 2	Community Accessibility	1	1	✓	-	2
		2	1	-	✓	
		3	2	✓	-	
		4	2	✓	-	
ASD 3	Public Transportation	1	1	-	✓	1
		2	1	✓	-	
ASD 4	Bicycle User Facilities	1	1	-	✓	0
		2	1	-	✓	
ASD 5	Site Landscaping	1	1	-	✓	0
		2	1	-	✓	
		3	1	-	✓	
ASD 6	Microclimate	1	1	✓	-	3
		2	1	✓	-	
		3	1	✓	-	
ASD 7	Storm Water Management	1	1	-	✓	0
		2	1	-	✓	
		3	1	-	✓	
Maximum Total Points			17	Total Points Earned		8

4. CONCLUSION

The findings of this study indicate that the Postgraduate Building of Universitas Negeri Jakarta has not fully met several Greenship criteria, such as Bicycle User Facilities, Site Landscaping, and Storm Water Management, each of which scored zero points. Overall, the building scored 8 points out of a maximum of 17 based on the ASD criteria analysis. Furthermore, deficiencies were observed in other aspects, such as Public Transportation, reflecting the need to improve facilities that support mobility for building users. The main challenges in implementing the Green Building concept include limited space availability and the high initial costs of adopting eco-friendly technologies. As a proposed solution, it is recommended to enhance land management by providing more green open spaces, adding supporting facilities for eco-friendly vehicles and cyclists, and involving the community in environmental

sustainability efforts. This study is expected to serve as a reference for developing other educational buildings that prioritize sustainability principles.

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BIBLIOGRAPHY

[1] Q. Shofiyah and V. Syahada, "Evaluasi Green Building Berdasarkan Greenship pada Bangunan Gedung RSUD Grati Pasuruan," *Journal of Regional and Rural Development Planning (Jurnal Perencanaan Pembangunan Wilayah dan Perdesaan)*, vol. 8, no. 2, pp. 132-145, June 2024.
[2] G. Kevin, I. Anggalimanto, H. P. Chandra, and S. Ratnawidjaja, "Analisis Tantangan dan Manfaat Bangunan Hijau," *Jurnal Dimensi Pratama Teknik Sipil*, vol. 5, no. 2, pp. 1–8, 2016
[3] L. Suryandari and Y. Danusastro, "Peranan riset dan peningkatan keterampilan arsitek lanskap dalam menghadapi penerapan konsep green building," *Jurnal Lanskap Indonesia*, vol. 3, no. 2, 2011.
[4] A. N. Author, "Penilaian Kriteria Green Building pada Bangunan Gedung Universitas Pembangunan Jaya Berdasarkan Indikasi Green Building Council Indonesia," Jurnal Teknik Sipil dan Lingkungan, vol. 10, no. 2, pp. 45-52. 2023.
[5] R. Dewi Nur’aini, "Analisis Konsep Green Roof pada Kampus School of Art, Design and Media NTU Singapore dan Perpustakaan UI Depok," *NALARs*, vol. 17, pp. 161, 2017
[6] A. E. Setyowati, M. N. Alfata, and A. Wibowo, "Sistem Rating Bangunan Hijau Indonesia," *Jurnal Permukiman*, vol. 9, no. 2, pp. 115–121, Aug. 2014
[7] I. P. Suryanegara, "Analisis Penerapan Green Building pada Bangunan Pendidikan (Studi Kasus: Green School Bali)," *Jurnal Arsitektur dan Lingkungan*, vol. 10, no. 2, pp. 45-55, 2023.
[8] Kandita, A.Emma, I.Irawati, “Kajian Kategori Tepat Guna Lahan Dalam Penerapan Konsep Green Building Di Itenas”, *Potensi*, vol. 20, no. 1, pp. 22-27, 2023.
[9] N. L. E. Janiawati, N. K. Agusintadewi, and Widiastuti, "Appropriate Site Development in the Application of the Green Building Concept: An Evaluation of the Planning of Gianyar Public Market," *Arsitektura: Jurnal Ilmiah Arsitektur dan Lingkungan Binaan*, vol. 19, no. 2, pp. 195–204, Oct. 2021
[10] Green Building Council Indonesia, "Greenship Existing Building, Version 1.1”, Green Building Council Indonesia, 2016.
[11] S. Ramadhanti and S. I. Al-Athas, "Optimasi Kinerja Kategori ASD (*Appropriate Site Development*) & WAC (*Water Conservation*) pada Bangunan Hijau Menggunakan Metode TRIZ (*Teorija Resenija Isobretatelskih Zadac*) (Studi Kasus Hotel Butik Greenhost Prawirotaman)," in *Proceedings of the Indonesian Architecture Works & Exhibition Seminar 2020: Sustainability in Architecture*, 2020.
[12] H.Taufik, “Optimalisasi Pencahayaan Gedung Berpedoman Pada Standar Nasional dan Green Building Council Indonesia“, *Potensi,* vol. 22, no. 2, pp. 104–195, Oct. 2022.
[13] R. B. Yasinta, M. A. Pradana, and Dahlia, "Analyzing Green Building of Appropriate Site Development Requirements in High Rise Building," *Jurnal Presipitasi,* vol. 21, pp. 132–143, 2024.
[14] Green Building Council Indonesia, “Greenship untuk Bangunan Baru Versi 1.2: Ringkasan Kriteria dan Tolok Ukur”. Jakarta, Indonesia: Green Building Council Indonesia, 2013.
[15] Kementerian Pekerjaan Umum Republik Indonesia, "Peraturan Menteri Pekerjaan Umum No. 5/PRT/M/2008 mengenai Ruang Terbuka Hijau (RTH) Pasal 2.3.1 tentang Kriteria Vegetasi untuk Pekarangan," 2008. [Online]. Available: https://www.pu.go.id
[16] Peraturan Menteri Pekerjaan Umum, "Pedoman Teknis Fasilitas dan Aksesibilitas pada Bangunan Gedung dan Lingkungan," Menteri Pekerjaan Umum, Indonesia, 2006.
[17] M. A. Rasyid, *Analisis Ruang Terbuka Hijau di Kampus A Universitas Negeri Jakarta*. Teknik Sipil/Pendidikan Teknik Bangunan, Universitas Negeri Jakarta, 2014