Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

IMPLEMENTATION LEVEL ANALYSIS OF GREENSHIP NEIGHBORHOOD ON RESORT RIAHI, NIRUP ISLAND, BATAM

Zures Gustiabani[1)], Hari Alfandi[2)], Nadia Khaira Ardi[3)]
[1,2,3)] Civil Engineering, Faculty of Engineering, Riau Kepulauan University
E-mail: gustiabanizures@gmail.com[1)], harialfandi99@gmail.com[2)], nadia.khairaardi01@gmail.com[3)]

ABSTRACT

The Greenship assessment tool could be one of the criteria which could be applied to green building. Green Building Council Indonesia (GBCI) as a green concept certification body in Indonesia had published a green concept assessment tool for the area called Greenship Neighborhood Version 1.0. With this, research was done to collect the points to get the ranking in Greenship Area for Hotel and Resort Area in Nirup Island. Nirup Island which was located in Sekanak Raya, Belakang Padang Batam was a new resort area. The study was to identify Greenship Neighborhood implementation in Riahi Resort Nirup Island and to calculate the result of feasibility assessment and success rate on Nirup Island Area of Greenship implementation. The methods used to evalute the issue were observation and interview in Nirup Island, analyze and processing the data, and documentations studies. The result of the study show that the Nirup Island Area was in Gold Category which had point 72 from 122 points. It had the point from every assessment which were 12 points in Land Ecological Enchancement, 23 points in Movement and Connectivity, 13 points in Water Management and Conservation, 4 point in Solid Waste and Material, 8 points in Community Wellbeing Strategy, 10 points in Building and Energy, and 2 points in Innovation and Future Development. With the highest point were getting from Movement and Connectivity (MAC) which was 23 points or 17.7 % and the lowest in Innovation and Future Development (IFD) which was 2 points or 1.6 %.

Keyword : Greenship Neighborhood, GBCI Rating Tools, Nirup Island

ABSTRAK

Alat penilaian Greenship menjadi salah satu kriteria yang dapat diterapkan pada *Green Building. Green Building Council Indonesia* (GBCI) sebagai Lembaga sertifikasi konsep hijau di Indonesia telah mengeluarkan alat penilaian konsep hijau untuk kawasan yang disebut *Greenship Neighborhood Versi 1.0*. Dengan ini, penelitian dilakukan untuk mengumpulkan nilai yang akan memberikan peringkat di Area untuk Hotel dan Area Resort di Pulau Nirup. Pulau Nirup yang terletak di Sekanak Raya, Belakang Padang Batam adalah kawasan resor baru. Penelitian ini adalah untuk mengidentifikasi impelementasi *Greenship Neighborhood* di resor Riahi Pulau nirup dan untuk menghitung hasil penilaian kelayakan dan tingkat keberhasilan pada Pulau Nirup dari implementasi Greenship. Metode yang digunakan untuk mengevaluasi masalah ini adalah observasi dan wawancara di Pulau Nirup, mengabalisis dan mengolah data, dan dokumentasi. Hasil penelitian menunjukkan bahwa area Pulau Nirup berada dalam kategori Emas denga poin 72 dari 122 poin. Nilai yang diperoleh dari setiap penilaian yaitu 12 point pada *Land Ecological Enchancement*, 23 poin pada *Movement and Connectivity*, 13 poin pada *Water Management and Conservation*, 4 poin pada *Solid Waste and Material*, 8 poin pada *Community Wellbeing Strategy,* 10 poin dari *Building and Energy*, dan 2 poin pada *Innovation and Future Developement*. Nilai tertinggi diperoleh dari *Movement and Connectivity (MAC)* yaitu 23 poin atau 17.7 % dan terendah pada *Innovation and Future Development (IFD)* yaitu 2 poin atau 1.6%

Kata kunci : Greenship Neighborhood, GBCI Rating Tools, Pulau Nirup

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

1. INTRODUCTION

A building gave around 33% of CO_2, consumed 17% of clean water, 25% of wood products, 30-40% of raw material and 40-50% of energy usage for constructing and operating [1]. Since that, one of the efforts to reduce it was with Green Building concept. Green building concept was a discourse that was expected to address the challenges of today development. The concept was created from planning stage, implementation and use of environmentally friendly contruction products, efficient in enegy and resource usage, low cost, and remark on comfortable and health of the residents, which all of whom adhere to the belief of sustainability [11].

Green Building was based on a building that apply the principal of classification as green building, passed the construction requirements, and had significant measurable performances in safe energy, safe water usage, and another resourcements [2]. In Indonesia, Green Building Council or known as GBCI was independent organization that committed in public education, socialization on principles about green building and construction.

GBCI created the Greenship Neighborhood which the assessment list for green area concept. In Greenship, there were several aspects needed to be fulfilled to be a green building such as Appropriate Site Development (ASD), Energy Efficiency and Conservation (EEC), Water Conservation (WAC), Material Resources and Cycle (MRC), Indoor Health and Comfort (IHC) and Building and Environment Management (BEM). But in Neighborhood, it was Land Ecological Enhancement (LEE), Movement and Connectivity (MAC), Water Management and Connectivity (WMC), Solid Waste and Material (SWM), Community Wellbeing Strategy (CWS), Building and Energy (BAE), and Innovation and Future Development (IFD)[3].

Here, Batam was a city which is located near to Sumatera Island, Malaysia and Singapore. It was one of the big cities in Indonesia which had a population of around one million people as of 2020 [4]. Nirup Island as one of the islands in Batam city had the implementation of Green Building concept for the Riahi Resort. It was chosen as prototype for sustainable tourist destination in Indonesia [10]. By using the green design principles, using the environmentally friendly materials, maintain the harmony and balance of the environmental quality of healthy, Riahi resort being one of the reasons the study was carried out. The implementation and success rate as a green building with greenship neighborhood assessment the Riahi resort was explored.

2. LITERATURE REVIEW

The process of good building planning could be realized if several aspects were fulfilled. One of those significant aspect was eco-friendly even in real still lack of attention. Eco-friendly concept or known as Green Building concepts recently was applied in big cities due to the decreasing of environment quality. In Indonesia, GBCI giving the green building concepts in planning, construction, operation and maintenance [5].

2.1 Green Building Principle

Green building was a building that applied environmental principles in design, construction, operation, management, and climate change handling [6]. It became necessity for sustainable development goals. Not only applied on office building, but also on government and private building. Based on Brenda and Robert Vale, Green Building Principles were [7]:

a. Conserving Energy

Main goal of this principle was utilised energy resources as much as possible in building operation.

b. Working with Climate

Main goal of this principle was using nature condition, climate and the environment in building operation.

c. Respect for Site

Here, planning was based on relation between building purposes and site of construction. It was mean for saving surrounding environment near to building.

d. Respect for User

the principle that prioritize safety, health, and comfortable of the user.

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

2.2 Green Building Council Indonesia (GBCI)

Green Building Council Indonesia was independent organization that has goals to transform and inform the implementation of green building principles to society in building construction sector [3]. They had four main programs there were Rating Development, Training and Education, Green Building Certification and Stakeholder Engagement [6]. It also told Greenship has 5 types of rating tools which are Greenship for New Building, Greenship for Existing Building, Greenship for Interior Space, Greenship Home for residential, and Greenship Neighborhood for site area.

2.3 Greenship Neighborhood Rating Tools

This Greenship Neighborhood rating system was for creating sustainable area where still in planning or operated building [3]. There were several benefits of applying the Greenship Neighborhood, first was maintaining the harmony and balance of the environmental ecosystem, as well as improving the quality of a healthy regional environment [3]. Second was minimizing the impact of the development on the environment. Next, improving the quality of the microclimate, applying the principles of connectivity, ease of access, safety and comfort on pedestrian paths, and maintaining a balance between needs and availability of resources in the future [3].

The assessment was based on interaction among building, nature and human in certain scope. It specially used for residential, business area, and industrial area. It had two types, first was **Plan** which would give awards for porjects at the design and planning finalization stage [3]. This type was for areas that were still in the planning stage. Second was **Built Project**, that was for projects that had been built or already operating. Projects were assessed comprehensively from design, construction and operational aspects; to determine overall regional performance [3]. For several categories in Greenship Neighborhood assessment is shown below in Table 1.

Table 1. Greenship Neighborhood Categories [3]

Category	Point
Land ecological enhancement	19
Movement and connectivity	26
Water management and conservation	18
Solid waste and material	16
Community wellbeing strategy	16
Building and energy	18
Innovation and future development	11
Total	124

From Table 1, The Land Ecological Enhancement (LEE) was interaction between mortals and environment in an area biologically or non-biologically which influence to each other [8]. While Movement and Connectivity (MAC) was people or things effort to reach the goals, which connected each other continuously. In Water Management and Conservation (WMC) was an attempt to control and manage the use of water in area by reusing for sustainable and the availability of water now and in the future [8]. Besides, the Solid Waste and Material (SWM) was the category for decreasing the impact to environment with waste management such as waste sorting and reusing the remaining construction materials.

The Community Wellbeing Strategy (CWS) was the overall approach strategy that related to ideas, planning, and execution in an certain activity to improve the social, material and spiritual order of life for the community in an area [8]. While the Building and Energy (BAE) category was used for environment management planning in area with saving energy, reducing light and noise pollution, encouraging the implementation of Green Building as a unified element of green development in the area. Last was Innovation and Future Development (IFD), this was the creation of something new from creativity, inventiveness and inspiration to improve the goal [3], [8].

In Greenship, Rate System was part of categories, contained any content that will be assessed, benchmarks had to be fulfilled, and how much point would be given [9]. It also said, there were three types criteria in Greenship, which were [9]:

a. Prerequisite criteria were criteria that exist in every category and fulfilled before going to assess for credit and bonus criteria. If prerequisite criteria were not enough then the assessment could not be continuing to the next step.
b. Credit criteria were not compulsory, it depend on the capability of the building.

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

c. Bonus criteria were the extra point for the building. The achievement was difficult and it was hardly found on site.

3. RESEARCH METHOD

This study focused on the Greenship Neighborhood Version 1.0 for knowing the application and percentage weight of achievement of the area studied which is The Riahi Resort in Nirup Island that based on references from the assessment document. To achieve this goal, observation, theory studies and documentation studies and interview were done.

A qualitative approach produced primary data, namely data from area observations. Then the quantitative approach was the output of the assessment supported by secondary regional master plan data.

4. RESULT AND DISCUSSION

The result and analysis of data gained from The Riahi Resort in Nirup Island, Batam.

4.1 Greenship Neighborhood Application

Standards to be achieved by applying The Greenship Neighborhood was spreading and inspiring in sustainable area. Here, in Greenship Neighborhood assessment was focusing on seven main criteria which are Land Ecological Enhancement, Movement and Connectivity, Water Management and Conservation, Solid Waste and Material, Community Wellbeing Strategy, Building and Energy, and Innovation and Future Development which is stated in Table 2.

Table 2. Greenship Neighborhood Categories [3]

Category	Point	Percentage
Land ecological enhancement	19	15
Movement and connectivity	26	20
Water management and conservation	18	15
Solid waste and material	16	13
Community wellbeing strategy	16	13
Building and energy	18	15
Innovation and future development	11	9
Total	124	100

In Greenship Neighborhood, every category had several points with goals and benchmarks. Beside the assessment was based on what the area was built for, there were mixed use area, commercials area, residential area, and industrial area. For every type of area used would have maximum point and bonus point. It is shown below in Table 3 as example for Land Ecological Enhancement category.

Table 3. Part of Assessment for Land Ecological Enhancement (LEE) Category [3]

Benchmarks	Mixed Use		Commercials		Residentials		Industrial	
	M	B	M	B	M	B	M	B
Land Ecological Enhancement (LEE)								
Goals: Maintaining the harmony and balance of the environmental ecosystem and improving quality health regional environment								
Benchmarks:								
1. Availability of Green Open Space which can be used for human interaction and nature	P		P		P		P	
2. The Green Open Space owned must comply with those required by Local Government								

*notes:
M: Maximum Point
B: Bonus Point
P: Prerequisite

4.2 Greenship Neighborhood Assessment

The Nirup Island was still dominated by forest and old building, for that the land was developed. The island was evaluated by Greenship Neighborhood with seven categories which were stated in Table 2. Here, before the assessment started, the Eligibility of area should be done. The Eligibility was divided by two part, first was the criteria regarding to government area development rules, second was the criteria by GBCI. The resort had 97.011-meter squares of area that pass the minimum area.

Besides, the resort had a lot of building for visitor and staff with one manager for the resort control. Also, it was available for data access. It

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

met the eligibility standards so that it could continue with the next assessment. It was shown in Table 4.

Table 4. Greenship Neighborhood Eligibility [3]

Eligibility		Plan	Built Project
A. Two Criterias regarding to Indonesias' Area Development Regulation are:			
1.	Area Masterplan		√
2.	Environmental Permit or Environmental Feasibility Letter or UKL/UPL recommendation and related permits		√
3.	Location Permit from National Land Agency (BPN).	-	-
4.	Space Utilization Permit from the Regional Government	-	-
B. Three Criterias regarding to GBCI Regulation are:			
1.	The minium area is 5000 m^2 and the maximum is 60 Hectares.**		√
	(1) The minimum land area of an Industrial Area is 50 Hectares.** (2) The minimum land area of a Certain Industrial Area for Micro, Small and Medium Enterprises is 5 Hectares** and Maximum 400 Hectares.**	-	-
2.	Minimum consists of 2 (two) buildings.		√
3.	One Manager		√
4.	Availability of regional data for GBCI to access regarding processes of certification.		√

a. Land Ecological Enhancement Assessment

Based on the result of criteria analysis in Greenship Neighbor hood, the Land Ecological Enhancement (LEE) was applied. It was sixty-three percent (63%) had been applied, from six assessment criterias. In fulfilling these criteria, there were seven points that had not been met, consisting of Land Revitalization (LEE3) less than four points, Microclimate (LEE4) less one point and Productive Land (LEE5) was two points less as shows in Table 4.

Besides, the LEE 1 and LEE 2 had maximum point. LEE 1 of the island was getting from observation that 40.800-meter square from 97.011-meter square or equal to 42% of island area was being the greening area. While, LEE 2 got full point due to maintain more than 30% of big trees, using local trees and planting young trees.

Table 5. Land Ecological Enhancement Point

No.	Criteria	Max. Point	Point
1.	LEE P (Green Base Area)	Has Value	Fulfilled
2.	LEE 1 (Green Area for Public)	4	4
3.	LEE 2 (Habitat Conservation)	6	6
4.	LEE 3 (Land Revitalization)	4	0
5.	LEE 4 (Microclimate)	3	2
6.	LEE 5 (Productive Land)	2	0
	Total	19	12

b. Movement and Connectivity Assessment

For Movement and Connectivity Category, the resort had reach eighty-eight percent (88%) from nine criterias stated. All criterias had maximum point for MAC P2, P3, 1, 2, 3, 4, and 6. The Resort was not doing the accessibility studi for people and good movement analysis that could not fulfilled the requirement. Also, it did not have the plan for bicycle network and storage as required in MAC 5 as stated in Table 4.

Table 6. Land Ecological Enhancement Point

No.	Criteria	Max. Point	Point
1.	MAC P1 (People and Goods Movement Analysis)	Has Value	Not Fulfilled
2.	MAC P2 (Pedestrian Network and Facilities)	Has Value	Fulfilled
3.	MAC P3 (Connected Area)	Has Value	Fulfilled
4.	MAC 1	10	10

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

	(Walkway Design Strategy)		
5.	MAC 2 (Public Transportation)	6	6
6.	MAC 3 (Public Utilities and Amenities)	2	2
7.	MAC 4 (Universal Accessibility)	3	3
8.	MAC 5 (Bicycle Network and Storage)	3	0
9.	MAC 6 (Shared Car Parking)	2	2
	Total	26	23

c. Water Management and Conservation Assessent

Water management and conservation was the attempt of the water use control in an area that contain the reuse and sustainability the usage of water for now and future. Here, around seventy-two percents (72%) had applied in Water Management and Conservation. In Nirup, 204 houses whose water needs must be met. The area came with Water Treatment Plant (WTP) for clean water provider. Design with underground drainage made it looked neat and beautiful. With that, the Water Schematic Diagram for resort area was made and fulfilled.

In Table 5, WMC 1 and WMC 4 had maximu m point. It was using the rainwater as alternative water that met 80% of water needs. Other hand, this area did the wastewater management that manage the processing used water from floor drain to IC went to the infiltration using palm fiber. By analysis, the water that comes out through this infiltration had become clean water. For WMC 2, it only got 4 point out of seven, due to no analysis of the calculation of stormwater enterring the drainage according to Greenship provisions. Besides, the WMC 3 had no point because of the coastal reclamation that damages the ecosystem.

Table 7. Water Management and Conservation Point

No.	Criteria	Max. Point	Point
1.	WMC P (Water Schematic)	Has Value	Fulfilled
2.	WMC 1 (Alternative Water)	6	6
3.	WMC 2 (Stormwater Management)	7	4
4.	WMC 3 (Water Body and Wetland Preservation)	2	0
5.	WMC 4 (Wastewater Management)	3	3
	Total	18	13

d. Solid Waste and Material Assessment

Here in Solid Waste and Material assessment, many criterias were not fulfilled. Started from Solid waste management and operational phase (SWM P) to Recycled and Reused material for Road Infrastructure (SWM 4) as shown in Table 8. The point was only given in SWM 3 or in regional materials for road and infrastructure. In SWM 3, two points by using the materials that was located a thousand kilometers from site, and two points by using originally materials from Indonesia. Riahi Resort was using the material distributed from Lingga District and Nirup Island. Sand and gravel from Lingga were located around 150 kilometers from site, and originally using local goods.

On the other side, the Resort were not having for waste management plan, neither the recycle or reused waste planning, construction waste sorting for combustible and non-combustible, waste water management, and waste sorting for organic and non-organic waste. The waste was only taken by ship to a temporary dump site. Since that, the Solid Waste and Material Assessment was only applied around twenty-eight percent (28%) from five criterias stated.

Table 8. Solid Waste and Material Point

No.	Criteria	Max. Point	Point
1.	SWM P (Solid Waste Management – Operational Phase)	Has Value	Not Fulfilled
2.	SWM 1 (Advanced Solid Waste Management)	4	0
3.	SWM 2 (Construction Waste Management)	4	0
4.	SWM 3	4	4

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

	(Regional Materials for Road Infrastructure)		
5.	SWM 4 (Recycled and Reuse Materials for Road Infrastructure)	2	0
	Total	14	4

e. Community Wellbeing Strategy Assessment

The purpose of assessing the Community Wellbeing Strategy was an approach to improve the social, material or spiritual order of life for the community in an area. Based on observation, the CWS criteria had applied in resort for around fifty percent (50%) as shown in Table 9. The resort had facility for people interaction such Open Green Space, swimming pool, club house, ferry terminal, gazebos, gym and spa. For that, the CWS 1 was given 2 point out of 2. Also, for CWS 4 and 5 was given the point due to the Malay cultural design of building, Coastal Malay consuetude for sailing and the use of some area for Tionghoa's Praying at the Monastery. In CWS 6, the area giving Closed-Circuit Television (CCTV) for twenty-four hours and the Security Guards that standby for safety and defense. But sadly, the resort did not facilitate locals for having business and socialize how to eco-friendly living and sustainable the environment.

Table 9. Community Wellbeing Strategy Point

No.	Criteria	Max. Point	Point
1.	CWS 1 (Amenities for Communities)	2	2
2.	CWS 2 (Social and Economic Benefits)	4	0
3.	CWS 3 (Community Awareness)	4	0
4.	CWS 4 (Mixed Use Neighborhood)	2	2
5.	CWS 5 (Local Culture)	2	2
6.	CWS 6 (Safe Environment)	2	2
	Total	16	8

f. Building and Energy Assessment

Based on the result in Table 10, the Nirup Island was having all criterias in maximum point except for BAE 1 and BAE 3. It was applying the criteria around fifty-five percent (55%). As shown, the island did not have the building that registered as Greenbuilding based on Greenship Assessment which caused the point was zero the criteria. For BAE 3 which less 2 point, caused by not using Smart Grid and District Cooling System. But the resort was using the LED lamp that consumed maximum 2.5 watt per meter squares.

Figure 1. Sky-Glow Limitation Lamp

On the other hand, the resort having several types of room with different rate of rent, having the solar panel as alternative energy, having light pollution reduction by using Sky-Glow Limitation Lamp as shown in Figure 1, using buggy as a vehicle and planting trees and plants on each side of the house to minimize noise pollution in the area.

Table 10. Building and Energy Point

No.	Criteria	Max. Point	Point
1.	BAE 1 (Greenship Building)	6	0
2.	BAE 2 (Affordable Housing)	1	1
3.	BAE 3 (Energy Efficiency)	4	2
4.	BAE 4 (Alternative Energy)	3	3
5.	BAE 5 (Light Pollution Reduction)	2	2
6.	BAE 6 (Noise Pollution Reduction)	2	2
	Total	18	10

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

g. Innovation and Future Development Assessment

This area was an area that was still under development, therefore this area would always change. In the case of housing development, each individual could request interior design outside of the housing plan. IFD 1 was criteria for sustainable instruction and the process of collecting documents for Greenship ceritification. Nirup island did not register the building or involving certified experts on Greenship Associate (GA) or Greenship Professional (GP).

Besides, based on observation the Nirup Islad was good managed. It managed by Accor and staffs, but not to energy efficiency and decreasig the volume of waste. In that, IFD 2 has two point because has Standard Operating Procedure (SOP) to control and manage the area. For Innovation or IFD 3, the resort did not have the innovation that submitted to GBCI which was caused the point was zero as shown in Tabel 11 below.

Table 11. Innovation and Future Development Point

No.	Criteria	Max. Point	Point
1.	IFD 1 (GA/GP Empowerment)	6	0
2.	IFD 2 (Estate Management)	4	2
3.	IFD 3 (Innovation)	4	0
	Total	11	2

4.3 Analysis of the Level of Implementation of the Greenship Neighborhood Concept

To determine the level of Greenship Neighborhood implementation in the Nirup Island area, the research must know the seven Greenship Neighborhood assessment criteria. Based on the result of the analysis, an assessment of the seven criteria determined was obtained 72 points out of 122 maximum points. The analysis used the Quantitatif Descriptive method in the Greenship qualification. This was showing how the resort rated in sustainable development area by Greenship Neighborhood. The total score of evaluation is shown in Table 12 below.

Table 12. Total Value of Greenship Neighborhood Area in Nirup Island

No	Criteria	Max. Point	Result Point	Max. (%)	Result (%)
1.	Land Ecological Enhancement (LEE)	19	12	15	9.5
2.	Movement and Conncetivity (MAC)	26	23	20	17.7
3.	Water Management and Conservation (WMC)	18	13	15	10.8
4.	Solid Waste and Material (SWM)	14	4	13	3.7
5.	Community Wellbeing Strategy (CWS)	16	8	13	6.5
6.	Building and Energy (BAE)	18	10	15	8.3
7.	Innovation and Future Development (IFD)	11	2	9	1.6
	Total	122	72	100	58.1

Based on table, total score of Greenship Neighborhood in Nirup Island area was 72 out of 122 point. The highest value was obtained from Movement and Connectivity (MAC) with point 23. While the lowest was Innovation and Future Development (IFD) with point 2.

However, in Green Building Council Indonesia (GBCI) giving the rate of value result for Greenship Qualification from the highest with Platinum Category and the lowest was Bronze Category which is stated in Table 13 below. From the table, Nirup Island which was had point seventy-two (72) or fifty-eight percent was categorized as Gold Category in Greenship Neighborhood Rate.

Table 13. Rate of Greenship Qualification[3]

Rate	Percentage	Min. Score
Platinum	73%	90-124
Gold	57%	71-89
Silver	46%	57-70
Bronze	35%	43-46

Sigma Teknika, Vol. 8 No.1: 146-154
Juni 2025
E-ISSN 2599-0616
P-ISSN 2614-5979

5. CONCLUSION AND RECOMMENDATION

From the data analysis, the Nirup Island Area had been used Greenship Neighborhood from GBCI. The result gave seventy-two points (72) out of hundred and twenty-two points (122) for the Nirup Island Area. Also known fifty-eight percent (58.1) the Island got the highest in Movement and Connectivity with 23 points or 17.7% and the lowest was in Innovation and Future Development (IFD) with 2 points or same as 1.6%

It was recommended for Nirup Island to improve the Solid Waste and Material Assessment which was one of the less points out of seven assessments. Solid waste should be managed by area sectors and using the dirty water for watering the plants. Also, on the Community Wellbeing Strategy assessment, Nirup Island Area or resort need to improve the facility on pedestrian and bike path.

ACKNOWLEDGEMENT

Special thanks are extended to Faculty of Engineering Riau Kepulauan University for invaluable and stimulating support for this research.

DAFTAR PUSTAKA

[1] O. E. Hapsari, “Analisis Penerapan Green Building Pada Bangunan Pendidikan (Studi Kasus : Green School Bali),” *Al-Ard J. Tek. Lingkung.*, 2018, doi: 10.29080/alard.v3i2.334.

[2] E. R. Mahyuddin, J. Rilatupa, and C. O. P. Marpaung, “Optimasi Facade Kantor Dinas Pendidikan Provinsi DKI Jakarta, Jalan Gatot Subroto Kavling 40-41, Jakarta dengan Konsep Bangunan Hijau,” *J. Magister Arsit. Univ. Kristen Indones.*, 2020.

[3] Green Building Council Indonesia, “Greenship Neighborhood Version 1.0,” *Autom. Constr.*, 2015.

[4] F. Bachtiar, “Identifikasi Keterhubungan Rumah Susun dan Transportasi Publik untuk Menunjang Pengembangan Kawasan Prioritas di Batam,” *Arsitekta J. Arsit. dan Kota Berkelanjutan*, 2021, doi: 10.47970/arsitekta.v3i02.247.

[5] F. F. Arndarnijariah, “Analisis Penilaian Kinerja Green Building Pada Proyek Rehabilitasi Bangunan Pasar Prawirotaman Kota Yogyakarta,” *Rev. Civ. Eng.*, 2021, doi: 10.31002/rice.v5i1.3587.

[6] H. Adeswastoto, B. Setiawan, A. Desrimon, F. Febryanto, A. A. Putra, and M. Islah, “Analisis Penerapan Green Building Pada Bangunan Gedung Klinik Universitas Pahlawan,” *J. Eng. Sci. Technol. Manag.*, vol. 3, no. 1, pp. 37–43, 2023, doi: 10.31004/jestm.v3i1.99.

[7] B. Vale and R. Vale, “‘Principles of green architecture’ from green architecture (1991),” in *The Sustainable Urban Development Reader, Third Edition*, 2014.

[8] M. Fajri, “Penilaian Penerapan Konsep Greenship Neighborhood Pada Kawasan Perumahan Cluster Bali Pavilion Di Pekanbaru,” *Prodi Perenc. Wil. dan Kota Fak. Tek.*, no. 163410085, 2021.

[9] D. Roshaunda, L. Diana, L. P. Caroline, S. Khalisha, and R. S. Nugraha, “Penilaian Kriteria Green Building Pada Bangunan Gedung Universitas Pembangunan Jaya Berdasarkan Indikasi Green Building Council Indonesia,” *WIDYAKALA J.*, 2019, doi: 10.36262/widyakala.v6i0.181.

[10] Kemenparekraf RI, "Pulau Nirup: Destinasi Hijau Yang Berkelanjutan di Batam" Website Badan Pariwisata dan Ekonomi Kreatif Republik Indonesia, 2024, Retrieved on: https://kemenparekraf.go.id/ragam-pariwisata/pulau-nirup-destinasi-hijau-yang-berkelanjutan-di-batam

[11] Karuniastuti, N. "Bagunan ramah Lingkungan" Swara Parta : Majalah Ilmiah PPSDM Migas, 5(1). Retrieved from: http://ejurnal.ppsdmmigas.esdm.go.id/sp/index.php/swarapatra/article/view/110