

# Vegetation Suitability Analysis for Green Open Space at Krisnadwipayana University Campus

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**Abstract:- Green open space is currently the most important part of spatial and regional planning in each region. The provision of green open space is stated in the Minister of Public Works Regulation No. 5 of 2008. Each area has different functions and types in determining the types of plants or vegetation that must exist following the function of the green open space of the area. This study was aimed to determine the suitability of vegetation types in the Krisnadwipayana University Campus Area based on the Minister of Public Works Regulation No. 5 of 2008. This research method uses a descriptive method with data analysis using the ideal assessment coefficient (KPI). The results of this study indicate that the existing vegetation at Krisnadwipayana University has represented most of the vegetation that must exist by the Minister of Public Works Regulation No. 5 of 2008. The suitability of the vegetation is expected to provide balance, comfort, and beauty for all academics at Krisnadwipayana University.**

**Keywords—** *Green Open Space, Vegetation, Regional Functions.*

## I. INTRODUCTION

The arrangement of urban green open spaces has been regulated in the Minister of Home Affairs Regulation no. 1 of 2007 and the Minister of Public Works No. 5/PRT/M/2008 concerning Guidelines for Provision of Green Open Space in Urban Areas. Green open space is an elongated area or pathway and/or clustered whose use is open, where plants grow, both those that grow naturally and are planted [1]. The function of green open space in urban areas is to balance the urban ecology with the presence of trees or plants that can

absorb carbon dioxide and absorb water. The quality of green open space must be met, but what is more important than that is the quantity of vegetation that grows so that it can be utilized optimally by the community using green open space [2]. Improving environmental quality currently requires plant diversity by the absorption function, soil conditions, and social aspects [3].

Vegetation is a collection of several plants. Several types of plants live simultaneously in a certain time and place. Types of plants or vegetation in green open spaces have been regulated in the Minister of Public Works Regulation No. 5 of 2008. The arrangement of vegetation is adjusted to the types of existing green open spaces [4]. The diversity of vegetation in each region makes green open spaces have an important role in biodiversity conservation, especially for urban areas with high population density [5,6]. Vegetation analysis is a way to study the composition and composition of types and forms or structures of vegetation. The characteristics of the vegetation will give a natural and different impression in each area [7,8].

Environmental problems have always been a top priority but in the end, they only became issues and protracted campaigns [9]. Campuses are public facilities that have great potential and contribution to providing private green open spaces in urban areas [10]. Parties can participate in providing private-based green open space as a form of concern for the environment. Krisnadwipayana University has an area of 103,530 m<sup>2</sup> with around 6,450 m<sup>2</sup> of green open space [11]. According to the Minister of Public Works No. 5 of 2008 schools with a minimum area of 9,000 m<sup>2</sup> are included in the type of green open space for urban village parks.

TABLE I. TYPES OF VEGETATION OF VILLAGE PARKS [1]

Garden Type	Green Area Coefficient (KDH)	Facility	Vegetation
Active	70 – 80 %	<ul style="list-style-type: none"> <li>• Open field</li> <li>• Running track, width 5 meters long 325 meters</li> <li>• public toilet</li> <li>• 1 unit shophouse (if needed)</li> <li>• garden chairs)</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 25 trees (medium and small trees)</li> <li>• Bush</li> <li>• Shrub</li> <li>• Ground cover</li> </ul>
Passive	80 – 90%	<ul style="list-style-type: none"> <li>• Pedestrian circulation width 1.5 – 2 m</li> <li>• public toilet</li> <li>• 1 unit shophouse (if needed)</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 50 trees (medium and small trees)</li> <li>• Bush</li> </ul>

		<ul style="list-style-type: none"> <li>• garden chairs)</li> </ul>	<ul style="list-style-type: none"> <li>• Shrub</li> <li>• Ground cover</li> </ul>
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Based on the table above, the green open space vegetation at Krisnadwipayana University entered into a passive park must have 50 trees consisting of medium and small trees, shrubs, shrubs, and ground covers.

Vegetation in green open space is the most important element because its role is to determine the function of the green open space. Characteristics of vegetation or plants will give a natural impression, especially in urban areas because it will provide a visual refresher against hard and rough elements [12]. Vegetation acts as autotrophs and producers in the ecosystem [13].

### II. RESEARCH METHOD

Based on the table above, the green open space vegetation at Krisnadwipayana University entered into a passive park must have 50 trees consisting of medium and small trees, shrubs, shrubs, and ground covers. Vegetation in green open space is the most important element because its role is to determine the function of the green open space. Characteristics of vegetation or plants will give a natural impression, especially in urban areas because it will provide a visual refresher against hard and rough elements [12]. Vegetation acts as autotrophs and producers in the ecosystem[13].

### III. RESULT AND DISCUSSION

This analysis was carried out to determine the existing vegetation according to the type of green open space in the urban village park. The suitability of the functions and benefits of each type of plant is different from one another, therefore the function of vegetation must be adapted to the function of the area [14]. The provision of green open space must pay attention to the function of the green open space so that the benefits provided by green open space are maximized for the area.

The steps of the ideal assessment coefficient (KPI) according to Hakim and Utomo in seeing the suitability of the vegetation function are as follows:

- Identifying the types of vegetation that exist in the Krisnadwipayana University campus area based on the classification of benefits.
- Choose the type of vegetation according to the type of park in the Krisnadwipayana University area. Plants that are by the campus function as a place to study, both as an ecological function (shade plants) and aesthetic functions (ornamental plants).
- Make identification of vegetation based on the Minister of Public Works No. 5 of 2008 concerning guidelines for the use of green open spaces in urban areas and real conditions on campus, to determine the types of shade plants and ornamental plants at Krisnadwipayana University.

#### A. Identification of vegetation types

The results of the identification of vegetation types in the Krisnadwipayana University Campus area consist as shown in table 1.

TABLE II. IDENTIFICATION OF VEGETATION TYPES IN THE KRISNADWIPAYAN UNIVERSITY AREA

No	Plant Type	Benefit
1	Sambung darah	Medicinal plants
2	Bambu cina	Decorative plants
3	Zodia	insect repellent
4	Duwet (Jamblang)	Medicinal plants
5	Zamia (tanaman dollar)	Decorative plants
6	Maja	Medicinal plants
7	Beringin	shade plant
8	Tanjung	Decorative plants
9	Kendal	Decorative plants
10	Kersen	shade plant
11	Jambu batu	shade plant
12	Jambu air	shade plant
13	Mangga	shade plant
14	Petai cina	shade plant
15	Bunga merah soka	Shrub/shrub
16	Glodokan tiang	shade plant
17	Trembesi	shade plant
18	Kiara payung	shade plant
19	Pohon angsana	shade plant
20	Pohon asam jawa	shade plant
21	Ketapang	Decorative plants
22	Palem	Decorative plants
23	Spider plant	Decorative plants
24	Sri rejeki	Decorative plants
25	Kenanga	Decorative plants
26	Kamboja	Decorative plants
27	Pohon kenari	Decorative plants
28	Pohon bungur	Decorative plants
29	Rembosa mini putih	Shrub/shrub
30	Lidah mertua	Shrub/shrub

#### B. Vegetation function

Each existing vegetation has its function. The function can be based on the shape or type

- The ecological function (shade) of vegetation in this function is represented by types of plants such as kersen, trembesi, kiara payung, Angsana trees, and many more which can be seen in table 1. These trees can provide supportive comfort so students can do outdoor activities with cozy. The shade tree itself has a shape like an umbrella or a canopy in the form of a mountain with a base in the form of a broad circle [15].
- The aesthetic function (ornamental plants) of vegetation in this function is represented by plants such as kenanga, tanaman kenari, sri rejeki, ketapang, rembosa mini, bunga merah soka and other trees which can be seen in table 1.

The aesthetic function of this vegetation can provide beauty in the area. campus area.

**C. Identification of vegetation by Permen PU No. 5 the Year 2008**

According to the Minister of Public Works No. 5/PRT/M/2008 criteria and functions of green open space vegetation in parks are divided into:

- Plants planted are non-toxic, not prickly, not easily broken and the roots do not damage the foundation.
- The shape of the plant is shady but not too dark.
- The height of the plant varies with variations in green and other colors in balance.
- Medium plant growth rate
- Types of annual growing plants
- Plants are the habitat of local plants and cultivated plants.
- The distance of the plants is half tight so that it provides shade.
- Able to absorb air pollution
- Resistant to plant diseases.
- Plants can attract birds.

Furthermore, identification of vegetation based on the Minister of Public Works No. 5/PRT/M/2008 and the real conditions in the field then correlate the suitability between the real conditions on campus and those issued by the Minister of Public Works Regulation No. 5 of 2008. The matrix will be presented in table 2.

TABLE III. SHADE PLANT ANALYSIS MATRIX

Permen PU No. 5/PRT/M/2008	Universitas Krisnadwipayana	Appropriate/Not suitable
Bunga kupu-kupu	Bambu Cina	Appropriate
Sikat botol		
Kemboja merah	Kemboja merah	Appropriate
Kersen	Kersen	Appropriate
Kendal	Kendal	Appropriate
Kesumba		
Jambu batu	Jambu batu	Appropriate
Bunga sakura		
Bunga saputangan		
Lengkeng		
Bunga lampion		
Bungur	Bungur	Appropriate
Tanjung	Tanjung	Appropriate
Kenanga	Kenanga	Appropriate
Sawo kecil	Sawo kecil	Appropriate
Akasia magium	Akasia magium	Appropriate
Jambu air	Jambu air	Appropriate
Kenari	Kenari	Appropriate

The type of vegetation in table 1 shows the type of vegetation that grows at Krisnadwipayana University and its benefits for campus conditions. The varied types of vegetation that exist on campus are not only for decoration but can help keep the campus environment beautiful and green.

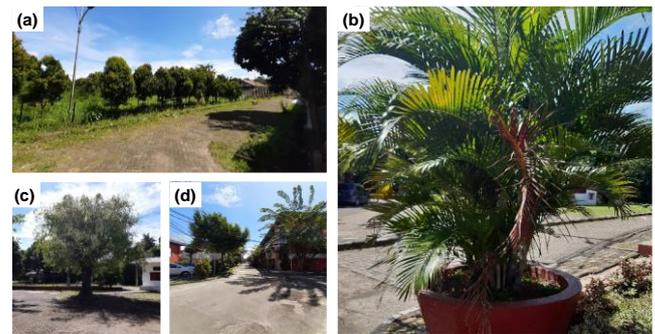


Fig. 1. The type of vegetation by the Minister of Public Works Regulation number 5 of 2008 is under the one at Krisnadwipayana University (only sample): (a) and (d) Vegetation area in Unkris; (b) Potted palm tree; and (c) Banyan Tree;

**IV. CONCLUSION**

The function of providing green open space must pay attention to the function of the area. The type of vegetation planted in green open spaces has been regulated in the Minister of Public Works No. 5 of 2008, this has been adjusted to the needs and functions of the green open space. The vegetation at Krisnadwipayana University already represents most of what should be in the parking area which is included in the campus or school category. The Krisnadwipayana University campus area is a place for teaching and learning activities to take place. The types and benefits of vegetation on campus can provide comfort for the academic community in teaching and learning activities.

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**REFERENCES**

- [1]. PU P. Peraturan Menteri Pekerjaan Umum. Direktorat Jendral Penataan Ruang Departemen Pekerjaan Umum. 2008.
- [2]. Rochim FN, Syahbana JA. Penetapan fungsi dan kesesuaian vegetasi pada taman publik sebagai ruang terbuka hijau (RTH) di Kota Pekalongan (studi kasus: Taman Monumen 45 Kota Pekalongan). Tek PWK (Perencanaan Wil Kota) 2013;2:314–27.
- [3]. Hastuti E, Utami T. Potensi Ruang Terbuka Hijau dalam Penyerapan Co2 Di Permukiman Studi Kasus: Perumnas Sarijadi Bandung dan Cirebon. J Permukiman 2008;3:106–14.
- [4]. Nurjanah N, Cahyana U, Nurjanah N. Pengaruh Penerapan Online Project Based Learning Dan Berpikir Kreatif Terhadap Keterampilan Proses Sains Siswa Kelas IV Pada Pelajaran IPA Di SD Nasional 1 Kota Bekasi . Buana Pendidik J Fak Kegur Dan Ilmu Pendidik 2021;17:51–8. <https://doi.org/10.36456/bp.vol17.no1.a3161>.

- [5]. KEMAL RA, YULITA A, NUFADIANTI G, ROSADI I, MUTHMAINAH SI. Tumbuhan di kota urban Indonesia: Nilai bioteknologis dan proyeksi keragaman pada 2050 n.d.
- [6]. Goddard MA, Dougill AJ, Benton TG. Scaling up from gardens: biodiversity conservation in urban environments. *Trends Ecol Evol* 2010;25:90–8.
- [7]. Susilo MJ, Dhaniaputri R. Analisis Potensi Pengembangan Ruang Terbuka Hijau (RTH) Di Kampus Universitas Ahmad Dahlan Yogyakarta. *Res Rep* 2016.
- [8]. HARSANTI AG. PENGEMBANGAN PERANGKAT PEMBELAJARAN DENGAN MENGGUNAKAN OUTBOND UNTUK PENINGKATAN PERILAKU SOSIAL SISWA KELAS IV SDN 01 TAWANGREJO. *Buana Pendidik J Fak Kegur Dan Ilmu Pendidik* 2018;14:21–9. <https://doi.org/10.36456/bp.vol14.no25.a1461>.
- [9]. Andary HA. Analisis Pengolahan Sampah Berbasis Zero Waste sebagai Salah Satu Upaya Universitas Semarang (USM) mewujudkan Eco-Campus. *Teknika* 2017;12:6–15.
- [10]. Hermawan D, Pramitasari D, Sudibyo S. Studi Kecukupan Ruang Terbuka Hijau Ideal Di Kampus Perguruan Tinggi Untuk Perencanaan Kampus Hijau Kasus Amatan Wilayah Aglomerasi Kota Yogyakarta Utara. *ReTII* 2017.
- [11]. Universitas Krisnadwipayana. *Statuta Universitas Krisnadwipayana*. 2016.
- [12]. Hakim R. Ruang Terbuka Hijau 2013. <https://rustam2000.wordpress.com/ruang-terbuka-hijau/>.
- [13]. Auliandari L, Lensari D, Angraini E. Keanekaragaman vegetasi di hutan kota sebagai salah satu ruang terbuka hijau publik Kota Palembang. *J Biosains* 2020;6:1–10.
- [14]. Mawardah L, Mutfianti RD. Penataan ruang terbuka hijau sebagai cara optimalisasi pembentukan karakter kota studi kasus ruang terbuka hijau di Pusat Kota Pacitan. *J Teknol UWIKA* 2013;1:19–27.
- [15]. Ariyanto J. Identifikasi Jenis dan Manfaat Pohon di Wilayah Kampus Utama Universitas Sebelas Maret. *Proceeding Biol. Educ. Conf. Biol. Sci. Enviromental, Learn.*, vol. 13, 2016, p. 711–6.