



INNOVATIVE: Journal Of Social Science Research  
Volume 4 Nomor 6 Tahun 2024 Page 8064-8082  
E-ISSN 2807-4238 and P-ISSN 2807-4246  
Website: <https://j-innovative.org/index.php/Innovative>

## Assessment of Suitability of Plant Communities of Pole and Tree Standa at Several Main Roads in Sumber Village, Indonesia

Alifia Namira Utomo<sup>1✉</sup>, Brighia Sastrani Naluri Allobua<sup>2</sup>, Feninta Setyaning Paramita<sup>3</sup>,  
Indah Puspita Sari<sup>4</sup>

Undergraduate Program in Environmental Science, Sebelas Maret University

Email: [alifian765@gmail.com](mailto:alifian765@gmail.com)<sup>1✉</sup>

### Abstrak

Vegetasi di sepanjang jalan utama perkotaan memegang peranan penting dalam meningkatkan keberlanjutan lingkungan. Penelitian ini bertujuan untuk mengevaluasi kesesuaian komunitas tumbuhan di sepanjang jalan utama Desa Sumber, Surakarta untuk mendukung infrastruktur hijau. Penelitian dilakukan dengan mengumpulkan data primer melalui survei lapangan, serta melalui studi pustaka. Analisis menggunakan skor berdasarkan aspek silvikultur, manajemen, dan estetika. Hasil penelitian menunjukkan bahwa terdapat 21 spesies dari 13 famili, dengan dominasi spesies berhabitus pohon dibandingkan dengan spesies tiang. Spesies seperti *Mangifera indica* dan *Handroanthus chrysotrichus* mendapat skor tinggi karena toleransinya terhadap kondisi perkotaan dan perawatannya yang mudah. Sebaliknya, spesies seperti *Artocarpus altilis* dan *Cyrtostachys renda* mendapat skor lebih rendah. Sebagian besar spesies memiliki status konservasi Least Concern, meskipun *Pterocarpus indicus* terdaftar sebagai Endangered. Vegetasi di Desa Sumber secara keseluruhan mendukung keberlanjutan ekologis, tetapi spesies dengan status konservasi terancam memerlukan perhatian khusus. Pemilihan tanaman yang sesuai dengan kondisi perkotaan sangat penting untuk menciptakan lingkungan yang sehat dan estetis.

Kata kunci: *estetika, jalan, manajemen, perkotaan, silvikultur.*

## Abstract

Vegetation along the main urban roads plays an important role in improving sustainable environments. The study aims to evaluate the suitability of plant communities along the main roads of Sumber Village, Surakarta to support green infrastructure. The study was conducted by collecting primary data through field surveys, as well as through literature studies. The analysis used scores based on silviculture, management, and aesthetic aspects. The results showed that there were 21 species from 13 families, with a dominance of tree-habitus species compared to poles. Species such as *Mangifera indica* and *Handroanthus chrysotrichus* scored high due to their tolerance to urban conditions and easy maintenance. In contrast, species such as *Artocarpus altilis* and *Cyrtostachys renda* scored lower. Most species have a conservation status of Least Concern, although *Pterocarpus indicus* is listed as Endangered. Vegetation in Sumber Village overall supports ecological sustainability, but species with threatened conservation status require special attention. The selection of plants that are suitable for urban conditions is very important to create a healthy and aesthetic environment.

Keywords: *aesthetics, roads, management, urban, silviculture.*

## INTRODUCTION

Vegetation along the main roads of the city plays a very important role in creating a healthy, beautiful, and sustainable environment (Ferrini et al. 2020). Types of plants, especially trees and pole stands, not only enrich the aesthetics of the city but also have crucial ecological functions. Trees on the side of the road can provide shade for pedestrians and drivers, which helps reduce the urban heat island effect (Cheela et al. 2021). In addition, this vegetation plays a role in reducing air pollution by absorbing carbon dioxide and filtering other pollutant particles, so that air quality in urban areas can be improved (Xing and Brimblecombe 2019). Trees and poles also function as natural sound absorbers, which help reduce noise levels from traffic, creating a calmer and more comfortable city atmosphere. On the other hand, the presence of this vegetation increases social value by creating green spaces that can be enjoyed by the community for activities or just relaxing, while fostering a sense of concern for the environment.

The suitability of roadside plants is an important factor supporting the success of green infrastructure, which not only contributes to aesthetics, but also to the functional and sustainable aspects of urban ecosystems (Radhakrishnan et al. 2019). The selection of the right type of tree and plant pole greatly affects the quality of life of the plant itself, such as the need for water, light, and space for root growth, as well as its impact on the visual beauty of the city. Plants that are suitable for the surrounding environmental conditions, such as types of trees that do not have roots that damage sidewalks or drainage systems, will be more durable and provide maximum benefits without causing

problems. In addition, the suitability of plants also plays a role in increasing the safety of road users, such as reducing obstructed views for drivers and pedestrians, and avoiding plants that have the potential to block traffic signs. Green lanes on the roadside, consisting of plants that are suitable for their space and function, function as a separator between the road and pedestrian areas, improve air quality, and create a safe and comfortable zone for road users. Thus, careful planning in choosing the right plants is essential to support the success of green infrastructure that is not only beautiful, but also sustainable and safe.

The presence of plants on green belts along urban roads has a strategic role in creating a healthy and comfortable environment. The characteristics of plants will give a natural impression to the environment, especially in urban areas, because plants have an aesthetic function and also provide a harmonious quality in the environment (Lestari et al., 2013). The presence of trees around city roads also has a positive impact, especially for the local community (Arfiandi, 2016). Assessment of the suitability of plants on the roadside is an important aspect considering that these plants must be able to withstand various urban environmental pressures such as motor vehicle pollution, dust, and limited growing space. It is necessary to determine the type of plant by considering various factors that are in accordance with the conditions of the location to be planted, before planting more vegetation (Erwan et al, 2022). Suitable plants will provide optimal benefits in improving air quality, reducing glare from vehicles, preventing erosion on the road body, increasing the aesthetics of the area, and creating comfort for road users. By analyzing plant suitability, the specific characteristics of various types of plants can be identified and how these plants can adapt to existing environmental conditions. In addition, the plants chosen must also be able to meet the increasing need for green space along with the increase in urban population, especially in Sumber Village.

Sumber Village itself has characteristics as a residential area. This area is passed by several main roads connecting the city's activity centers, making the existence of green lanes along the road very important to reduce the negative impacts of transportation activities. The presence of vegetation along this green lane is expected to provide ecological benefits for Sumber Village, in addition to improving urban aesthetics. This study aims to assess the suitability of plant communities, especially trees and plant poles, along the main roads of Sumber Village. The results of this study are expected to be a guide in the selection and management of plants to improve environmental quality along main roads in urban areas.

## RESEARCH METHODS

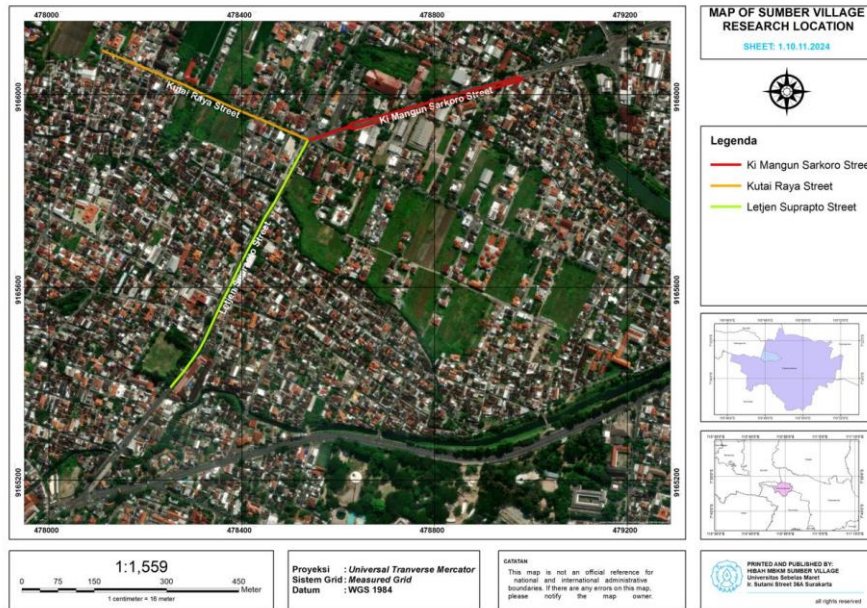


Figure 1. Map of data collection locations in Sumber Village

This research was conducted in November 2024 on several main roads in Sumber Village, Banjarsari District, Surakarta City. This research focuses on the biodiversity of plants on the roadside on three research routes, namely Jalan Ki Mangun Sarkoro as station one, Jalan Kutai Raya as station 2, and Jalan Letjen Suprpto as station 3 which can be seen in Figure 1. Of the three research routes, the research was conducted on both sides of the road.

The data used in this study consisted of primary data and secondary data. Primary data were obtained through direct surveys at the research location, where location coordinates were collected, plant species names were recorded, plant diameter measurements were measured, and visual documentation was done using a camera. Meanwhile, secondary data were collected through literature studies that included information on tree canopies and tree architecture models, species conservation status based on the IUCN Red List, and species distribution data from the Global Biodiversity Information Facility (GBIF). In data collection, several tools and materials were used, including tally sheets to record data, identification books to recognize species, cameras for documentation, GPS to determine locations, meters for diameter measurements, and road signs and stationery to facilitate the recording process in the field.

In this study, a field survey was conducted with the aim of determining the tree species that make up each research location. The criteria for trees that fall into the category of mature trees are  $>20$  cm (Kusumawati et al., 2022). After that, a record was made of all species names at the location where the species was found, followed by a

suitability analysis or scoring which is divided into 3 categories Afrianto et al (2019), namely:

Height: 39-40

Medium: 31-38

Height: 39-46

## RESULTS AND DISCUSSION

### Description of Research Location

Sumber Village is one of the villages located in Banjarsari District, Surakarta City, with the characteristics of an urban area that has a fairly high population density and economic activity (Widodo and Sunarti 2019). Although located in an urban area, this village still maintains a number of green areas, especially along its main roads, which are marked by the presence of various types of vegetation in the form of trees and poles. This condition creates a relatively comfortable microclimate and plays an important role in reducing the impact of air pollution and providing aesthetic value to the urban environment. Sumber Village has an area of around 1.47 km<sup>2</sup> (BPS 2024) with a relatively flat topography and is at an average altitude of 92 meters above sea level (Pramitha et al. 2020). This area has experienced rapid development as a residential area, but still maintains the concept of sustainable development by paying attention to the greening aspect of the city.

The selection of Jalan Ki Mangun Sarkoro, Jalan Kutai Raya, and Jalan Kahuripan Utara Raya in Sumber Village as research locations is based on the consideration that the three roads represent significant urban green corridors with diverse vegetation in the road median and sidewalk zones. These roads have high traffic intensity and function as the main access connecting various important areas in Surakarta City, so that the existence of plant communities along these roads is an important aspect in urban environmental management and ecosystem services. In addition, these three roads have vegetation characters that have grown for a long time and are relatively well maintained, making them ideal locations to study the suitability of plant communities in the context of urban landscapes.

### Species Found

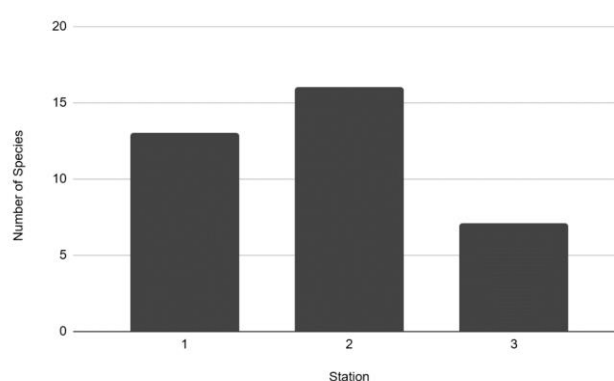


Figure 2. Graph of the number of species at each station.

Based on Figure 2. Variations in the number of different species were found at each observation station. Station 2 had the highest species richness with 16 species, followed by Station 1 with 13 species, and Station 3 with 7 species. This significant difference can be attributed to the characteristics of each location, where Station 2 likely has a wider green space and environmental conditions that are more supportive for the growth of various types of vegetation. The species composition at each station shows variation in the selection of plant types, reflecting efforts to create visual diversity while maximizing the ecological function of street vegetation (Nrendra et al. 2023). Differences in the number of species between stations can also be influenced by factors such as the intensity of human activity, road width, availability of space for planting, and edaphic and microclimate conditions at each location (Both et al. 2019). Station 2, which has the largest number of species, shows good potential as an urban green corridor, where high species diversity can support various ecosystem functions such as urban wildlife habitat, air pollution reduction, and microclimate regulation. Meanwhile, Station 3 with a relatively smaller number of species may require additional reforestation programs to increase its vegetation diversity.

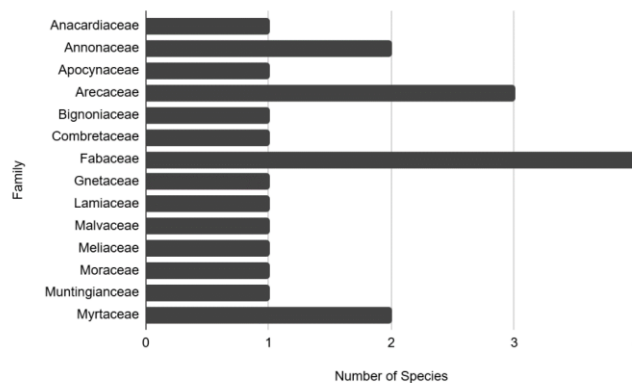


Figure 3. Graph of the number of species families found

The results of the vegetation inventory on three main roads in Sumber Village found a total of 21 species from 13 families (Figure 3). The Fabaceae family has the largest representation with 4 species, followed by Arecaceae with 3 species, and Annonaceae and Myrtaceae with 2 species each. The other nine families, namely Anacardiaceae, Apocynaceae, Bignoniaceae, Combretaceae, Gnetaceae, Lamiaceae, Malvaceae, Meliaceae, Moraceae, and Muntingiaceae are each represented by 1 species. The dominance of the Fabaceae family indicates that types from the legume group are

widely chosen as road vegetation because of their good adaptability to urban environments, as well as their benefits in absorbing pollutants and providing shade (Fahik 2024). Meanwhile, the presence of the fairly dominant Arecaceae family reflects the preference for planting palms as aesthetic elements of the road landscape (Novianti et al. 2023). The diversity of families found shows that the vegetation on the three road sections has been designed with functional and aesthetic aspects in mind, although some families are only represented by one species.

There are three species that have the widest distribution because they are found in all three observation stations, namely *Polyalthia longifolia*, *Plumeria rubra*, and *Swietenia mahagoni*. The three species found in all stations indicate good adaptability to various urban environmental conditions. *Polyalthia longifolia* is often chosen as a roadside plant because of its columnar characteristics, making it ideal as a road guide and visual divider, and has dense leaves that are effective in reducing noise and absorbing pollutant particles (Indrawati and Nurhasan 2021). *Plumeria rubra*, in addition to having high aesthetic value with its beautiful and fragrant flowers, also shows good resistance to polluted environmental conditions and direct sunlight exposure, making it the right choice for road vegetation (Verma 2016). Meanwhile, *Swietenia mahagoni* is a tree with a shady canopy that is commonly used in urban greening because of its rapid growth, ability to absorb air pollutants, and high economic value as a producer of quality wood (Fadhilah et al. 2021).

Based on their habitus, of the 21 species found, there are 16 species with tree habitus and 5 species with pole habitus. The tree habitus species identified include *Mangifera indica*, *Annona muricata*, *Plumeria rubra*, *Cocos nucifera*, *Handroanthus chrysotrichus*, *Terminalia catappa*, and all members of the Fabaceae family. Meanwhile, the pole habitus species include *Polyalthia longifolia*, *Cyrtostachys renda*, *Dyopsis lutescens*, *Muntingia calabura*, and *Syzygium cumini*. The dominance of tree habitus species indicates that road vegetation planning in this area prioritizes the function of shading and microclimate amelioration, considering that trees have wider canopies and better ability to absorb pollutants and lower air temperature compared to pole habitus vegetation (Abd El-Ghani et al. 2015). The pole species found function more as aesthetic elements and road dividers, especially types from the Arecaceae family which are commonly used in urban landscape architecture.

Plant Species Suitability

Table. 1 Plant Species Suitability

N o.	Family	Species	Local Name	Silvicult ure	Manage ment	Aesthe tics	Tot al	Level
1	Anacardia ceae	<i>Mangifera indica</i> L.	Mango	21	14	9	44	High
2	Annonace ae	<i>Annona muricata</i> L.	Soursop	17	8	7	32	Medi um
3	Annonace ae	<i>Polyalthia longifolia</i> (Sonn.) Thwaites	Glodogan pole	20	14	9	41	High
4	Apocynac eae	<i>Plumeria rubra</i> L.	Cambodia	20	14	10	44	High
5	Arecaceae	<i>Cocos nucifera</i> L.	Coconut	20	13	10	43	High
6	Arecaceae	<i>Cyrtostachys renda</i>	Red Palm	16	10	9	35	Medi um
7	Arecaceae	<i>Dypsis lutescens</i> (H. Wendl.) Beentje & J. Dransf.	Yellow palm	18	11	9	38	Medi um
8	Bignoniac eae	<i>Handroanthus chrysotrichus</i> (Mart. ex DC.) Mattos	Yellow Tabebuya	21	14	9	44	High
9	Combreta ceae	<i>Terminalia catappa</i> L.	The Ketapang	17	12	8	37	Medi um
10	Fabaceae	<i>Pterocarpus indicus</i>	Angsana	18	13	10	41	High
11	Fabaceae	<i>Sesbania grandiflora</i> (L.) Poir.	Turi	21	11	10	42	High
12	Fabaceae	<i>Samanea saman</i> (Jacq.) Merr.	Rain tree	20	11	9	40	high
13	Fabaceae	<i>Albizia chinensis</i>	Sengon	19	12	7	38	medi

		(Osbeck) Merr.						um
14	Gnetaceae	<i>Gnetum gnemon</i> L.	Mlinjo	22	11	10	43	high
15	Lamiaceae	<i>Tectona grandis</i>	Teak	20	12	9	41	high
16	Malvaceae	<i>Hibiscus tiliaceus</i> L.	Waru	20	14	9	43	High
17	Meliaceae	<i>Swietenia mahogany</i> (L.) Jacq.	Mahogany	19	14	9	42	High
18	Moraceae	<i>Artocarpus altilis</i> (Parkinson) Fosberg	Breadfruit	15	9	8	32	Medi um
19	Muntingia ceae	<i>Muntingia calabura</i> L.	Cherry	20	11	9	40	High
20	Myrtaceae	<i>Syzygium aqueum</i> (Burm.fil.) Alston	Guava	19	13	9	41	High
21	Myrtaceae	<i>Syzygium cumin</i> (L.) Skeel	Jamblang	21	10	9	40	High

Based on the data in Table 1., each species is assessed based on three main aspects, namely silviculture, management, and aesthetics. Each of these aspects provides a score that reflects the suitability of the plant in that category. The total score obtained is then used to determine the level of sustainability of the species, which is classified into three categories: low, medium, or high. Species included in the high score category, with a value range between 39-46, indicate that the species has optimal sustainability potential in the context of the environment being studied. Of all the species found, it is known that 15 of the 21 species fall into the high score category. The species *Mangifera indica*, *Plumeria rubra*, and *Handroanthus chrysotrichus* are species that fall into the high score category, namely 44. Species included in the high score category generally have characteristics that are advantageous in various aspects. These plants are not only easy to manage and resistant to disease, but also have high aesthetic value, making them ideal choices for greening and public spaces. In addition to providing ecological benefits such as improving air quality and soil conservation, these species also support the sustainability of local ecosystems by contributing positively to biodiversity (Yulia et al., 2023). The presence of species in the high-scoring category also has a positive impact on the comfort and quality of life of the community, because these plants create beautiful

and functional green paths.

Meanwhile, species that fall into the medium category have a total score ranging from 31-38. The species found in the medium category is namely *Annona muricata*, *Cyrtostachys renda*, *Dyopsis lutescens*, *Terminalia catappa*, *Albizia chinensis*, and *Artocarpus altilis*. Species in this category show quite good characteristics in terms of silviculture, management, and aesthetics, but are not as prominent as those in the "High" category. These species generally provide ecological and economic benefits, but the challenge is at a moderate level of management and aesthetics. Although they are often used for greening and providing shade, some species may require higher care in terms of pruning or protection against pests. The aesthetic value that is not as beautiful as ornamental trees or city icons causes these species to often be found in more functional open spaces, such as roadsides with standard management. Ecologically, species in this medium category still play a role in improving environmental quality by helping to reduce air pollution and improve soil quality (Handayani et al., 2024). However, in a sustainability context, this species may be less optimal than high-scoring species due to more complex management requirements and less pronounced aesthetic impact.

From the results of the assessment that has been carried out, no species were found in the low category, this indicates that all species found along the road in Sumber Village have met the minimum standards in terms of silviculture, management, and aesthetics. This reflects the careful and planned selection of plants by the green open space management, which prioritizes the adaptability of species to urban environmental conditions. In urban areas such as Sumber Village, plants must be able to survive in conditions that are often less than ideal, such as air pollution, compacted soil, and limited water availability (Czaja et al., 2020). Planting trees along the roads in Sumber Village reflects careful selection of species by considering silviculture, management, and aesthetic aspects. The selected species have good silvicultural value, are able to survive in harsh urban conditions, such as pollution and compacted soil. This selection also prioritizes plants that require minimal maintenance and have high tolerance to pests or diseases, so that maintenance cost efficiency can be achieved (Farinati et al., 2022). Aesthetics are also an important consideration, with plants that are not only visually appealing but also provide shade that reduces temperatures and increases pedestrian comfort. By fulfilling these three aspects, these trees not only function as aesthetic elements but also provide significant ecological benefits. These trees help absorb carbon dioxide, produce oxygen, and improve air quality by reducing pollution (Mei et al., 2021). In addition, these trees play a role in controlling rainwater, reducing the risk of flooding,

Copyright @ Alifia Namira Utomo, Brighia Sastrani Naluri Allobua, Feninta Setyaning Paramita,

and creating habitats for urban biodiversity. Overall, planting trees in this green belt supports environmental health and community well-being.

#### Silviculture Requirements

The types of species found along the research route have a high silvicultural suitability value, one of which is *Mangifera indica*, this species is often found along urban green belts due to its ability to grow in nutrient-poor soils, and has strong roots that do not damage surrounding roads or buildings. *Mangifera indica* is also resistant to high temperatures and intense sun exposure, and can survive in drought conditions (Kagy et al., 2024). In addition, its ability to restore soil fertility adds to its ecological value in urban spaces. *Pterocarpus indicus* has sturdy roots and strong stems, and can grow in a variety of soils (Flores et al., 2021). *Pterocarpus indicus* can also survive in hot temperatures and strong sunlight, making it an ideal shade tree for urban environments, without damaging surrounding roads or buildings (Yulia et al., 2023). *Gnetum gnemon* is a species that can withstand a variety of conditions, including poor soil and drought, and is suitable for urban ecosystems that are poor in elements, high temperatures and water shortages.

Meanwhile, the species with the lowest silviculture scores are *Artocarpus altilis* and *Cyrtostachys renda*. This is due to several factors that make these two species less suitable for planting along roads in Sumber Village. *Artocarpus altilis* requires fertile soil and high humidity to grow well, making it less suitable for soil conditions that may be poorer in nutrients in urban environments (Yulia et al., 2023). In addition, *Artocarpus altilis* grows quite slowly and is not resistant to various disturbances, such as pest attacks or extreme climate change. Meanwhile, *Cyrtostachys renda* also has quite specific needs, such as more stable temperatures and high humidity, as well as supportive soil conditions (Loganathan et al., 2021). *Cyrtostachys renda* is more suitable for growing in humid tropical forests, and is not very resistant to drought or high temperatures. The roots of *Cyrtostachys renda* also tend to be more sensitive to damage and can damage roads or buildings if not planted carefully.

#### Management Requirements

The type of species that has the highest management requirements encountered throughout the research path is the *Mangifera indica* species which is spread across 3 research locations. This species is one of the species with the highest management requirements because when viewed from various factors that affect the sustainability of the growth of this species, this species can be said to be included in the high requirements category. Planting the *Mangifera indica* species is one of the species where the planting, maintenance, and handling methods are quite easy and not too

complicated (Kurniasih et al, 2024), but of course it must also be done in the right way and time, this aims to keep the tree maintained and its growth healthy. Mango trees are known as trees that are classified as large and have thick and dense leaves, for this reason mango trees can be used or function as wind protection because this tree is classified as strong and dense. In addition, mango trees certainly have easy types of utilization, where all parts of this tree are very useful, starting with mango wood which has economic value that can be used to make home furnishings or furniture, continued with mango leaves which function as traditional medicine, namely used to overcome digestion or blood sugar levels, and mango fruit which is known that this mango fruit is most widely used for direct consumption or processed into various processed products. Finally, this mango tree has a function in absorbing carbon dioxide and producing oxygen through the process of photosynthesis and converting it into oxygen in the contest of handling air pollution.

One of the species with the lowest management requirements encountered throughout the research path is *Annona muricata* which was found at 2 research locations. This species is categorized as low in management requirements due to several known factors. Although this *Annona muricata* species looks easy to plant, it actually requires good soil drainage (Setya, 2019) and is very sensitive to drought which can hamper its growth and maintenance, this species is also prone to several types of diseases that require more attention to its maintenance. This tree is also categorized as a tree that is less ideal for shelter compared to other species found at the location, this is because this tree is medium in size and even smaller than other large trees in Sumber Village. And this species has limitations in dealing with pollution because it is not very effective in dealing with air pollution on a large scale.

#### Aesthetic Requirements

One of the species with the highest aesthetic requirements encountered along the research path is *Plumeria rubra*. This is due to several reasons that make this species attractive and one of the highest categories in aesthetic requirements. This species has flowers that are beautiful and vary in color. Not only that, the colors produced are also attractive and have a fragrant aroma (Safitri, 2021). This makes the *Plumeria rubra* species one of the species that is suitable for planting along Sumber Village to add aesthetics and beauty along the research path. Meanwhile, the species with the lowest requirements encountered along the research path is *Albizia chinensis*. In contrast to the *Plumeria rubra* species which has beautiful flowers that are the attraction of the species, *Albizia chinensis* has flowers that are relatively not so striking, the shape of the flowers

produced tends to be small and does not provide a very striking visual effect. Therefore, this species has a lower aesthetic requirement score compared to the *Plumeria rubra* species.

### Tree Architecture Models and Ecological Functions

Table 2. Tree Architecture Model and Type of Canopy

No	Family	Species	Local Name	Canopy		Model Architecture	Source (reference)
				Shades	Windbreaker		
1	Anacardiaceae	<i>Mangifera indica</i> L.	Mango	+	-	Scarrone	Prasetio et al. (2021)
2	Annonaceae	<i>Annona muricata</i> L.	Soursop	+	-	Troll	Arlianty (2020)
3	Arecaceae	<i>Cocos nucifera</i> L.	Coconut	-	+	Corner	Arlianty (2020)
4	Arecaceae	<i>Cyrtostachys renda</i>	Red Palm	-	-	Corner	Arlianty (2020)
5	Bignoniaceae	<i>Handroanthus chrysotrichus</i> (Mart. ex DC.) Mattos	Yellow Tabebuia	+	+	Scarrone	Afrizal et al. (2022)
6	Combr etaceae	<i>Terminalia catappa</i> L.	The Ketapan g	+	-	Aubreville	Hamdani et al. (2022)
7	Fabaceae	<i>Pterocarpus indicus</i>	Angsana	+	+	Troll	Prasetio et al. (2021)
8	Fabaceae	<i>Samanea saman</i> (Jacq.) Merr.	Rain tree	+'	+	Troll	Fajar et al. (2021)
9	Fabaceae	<i>Albizia chinensis</i> (Osbeck) Merr.	Sengon	+'	-	Troll	Prasetio et al. (2021)
10	Gnetaceae	<i>Gnetum gnemon</i> L.	Mlinjo	-	-	Scarrone	Sudrajad and Wiyono (2012)
11	Lamiaceae	<i>Tectona grandis</i>	Teak	-	-	Scarrone	Prasetio et al. (2021)

1	Malvac					Champag	
2	eae	<i>Hibiscus tiliaceus</i> L.	Waru	+	+	nat	Soimin
1	Meliace	<i>Swietenia mahagoni</i> (L.)	Mahoga				
3	ae	Jacq.	ny	+	+	Rauh	Arlianty (2020)
1	Morace	<i>Artocarpus altilis</i>	Breadfru				
4	ae	(Parkinson) Fosberg	it	+	-	Rauh	Hidayatullah et al. (2021)
1	Muntin						Prasetio et al.
5	giaceae	<i>Muntingia calabura</i> L.	Cherry	+	+	Troll	(2021)
1	Myrtac	<i>Syzygium cumini</i> (L.)	Jamblan				Hidayat et al.
6	eae	Skeels	g	+	+	Koriba	2021

Based on the data in Table. 2, tree species at the research location have canopies that function as windbreakers and shades. Of the total 16 species identified, there are 12 species that function as shade, including *Mangifera indica*, *Annona muricata*, *Handroanthus chrysotrichus*, *Terminalia catappa*, *Pterocarpus indicus*, *Samanea saman*, *Albizia chinensis*, *Hibiscus tiliaceus*, *Swietenia mahagoni*, *Artocarpus altilis*, *Muntingia calabura*, and *Syzygium cumini*. This canopy is very important because it functions as an umbrella to shade the area and lower the temperature around the area in a certain radius, especially along roads or public areas (Werdiningsih, 2007). Meanwhile, there are 8 species that function as windbreakers, namely *Cocos nucifera*, *Handroanthus chrysotrichus*, *Pterocarpus indicus*, *Samanea saman*, *Hibiscus tiliaceus*, *Swietenia mahagoni*, *Muntingia calabura*, and *Syzygium cumini*. The presence of these species can help reduce wind speed and protect the surrounding area from the impact of strong winds (Saroh, 2020). Based on data on tree architecture models at the research location, there are also variations that provide various functional and aesthetic benefits. Most of the species in this study have a Troll tree architecture model, namely 5 species, such as *Annona muricata* and *Pterocarpus indicus*.

The Troll architectural model generally shows the characteristics of trees with sympodial plagiotropic stems since childhood, flowering trees when mature and leaves tend to be opposite (Nurcahyati and Ardiansyah, 2021). This model has scattered branches, making it suitable for the role of shade. The Scarrone model is also owned by 4 species found, such as *Mangifera indica* and *Handroanthus chrysotrichus* trees, with a dense canopy at the top that adds a neat and symmetrical impression to the street landscape. Other architectural models, such as Corner owned by 2 species found, namely *Cocos nucifera* and *Cyrtostachys renda*, provide an exotic appearance and allow sunlight

to reach the lower area, making it suitable for aesthetics without too much shade. The Aubréville model, found in *Terminalia catappa*, forms a horizontal layer that functions well as a windbreak. Meanwhile, the Champagnat model in *Hibiscus tiliaceus* looks more open, while the Rauh model in *Swietenia mahagoni* and *Artocarpus altilis* provides a sturdy and orderly appearance. Finally, the Koriba model on *Syzygium cumini* with a dense and symmetrical canopy is also effective as a shade. The diversity of this architectural model allows the use of tree species according to needs, both for shade, windbreaks, and landscape beauty.

#### Plant Conservation Structure Found Based on IUCN RedList

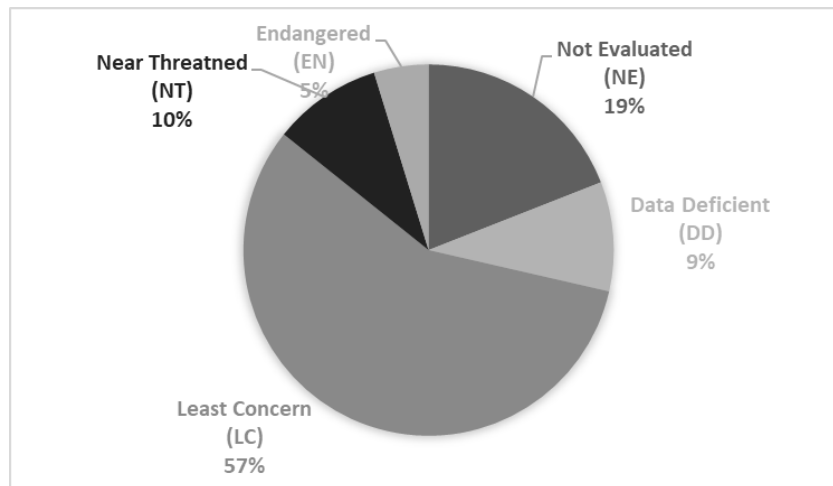


Figure 5. Plant Conservation Graph Found Based on IUCN RedList

Based on the conservation status of plants referred to from the IUCN Red List, there are a total of 21 plant species found at the research location in Sumber Village, which are grouped into several categories in Figure 5. The majority of species have Least Concern (LC) status of 12 species (57%) which indicates that their populations are still stable and do not face the threat of extinction in the near future. There are 4 species (19%) with Not Evaluated (NE) status, this status means that the plant has not been reviewed to determine whether or not there is a significant threat of extinction. As many as 2 species (9%) have Data Deficient (DD) status which means that there is still a lack of data for an accurate conservation risk assessment. As many as 2 species (10%) have Near Threatened (NT) status, namely *Dyopsis lutescens* and *Swietenia mahagoni*, where these species are not currently considered threatened, but are approaching the criteria for a more worrying status in the future. And as many as 1 species (5%) has Endangered (EN) status, namely *Pterocarpus indicus* which requires special attention because it is threatened with extinction. Species with Not Evaluated (NE) and Data Deficient (DD) status still require further research to determine their conservation status accurately. Thus, these data indicate the diversity of conservation status of plant species in the research location,

which requires special conservation and monitoring measures, especially for threatened species so that they can remain sustainable in their habitat.

## CONCLUSION

The existence of vegetation in Sumber Village is an element that functions in greening and adding to the aesthetics of the environment. Based on the results of the research that has been conducted, there are 21 species from 13 families found along Jalan Ki Mangun Sarkoro, Jalan Kutai Raya, and Jalan Kahuripan Utara Raya. Species with tree habitus totaling 16 are more dominant than poles totaling 5 species. Species such as *Mangifera indica* and *Handroanthus chrysotrichus* are included in the high score category due to their tolerance to urban conditions and relatively easy maintenance. However, species with threatened conservation status, such as *Pterocarpus indicus* and *Dypsis lutescens* must continue to be considered so that their existence is maintained. The selection of plants along the research location must be appropriate by considering several aspects of requirements such as silvicultural requirements, management requirements, and aesthetic requirements to support the sustainability of green spaces along the Sumber Village road.

## BIBLIOGRAPHY

- Afrizal, M. S., Simanjuntak, B. H., & Sutrisno, A. J. (2022). Penilaian fungsi pohon tepi Jalan Diponegoro Kota Salatiga dalam menjerap debu. *Agrifor: Jurnal Ilmu Pertanian dan Kehutanan*, 21(2), 303-314.
- Agustin, A., Fitriyani, A., Lindiyani, L., & Supriatna, A. (2024). Diversity of the Poaceae Family in the Campus I Area of UIN Sunan Gunung Djati Bandung. *Polygon: Journal of Computer Science and Natural Sciences*, 2(4), 15-23.
- Aksa, S. (2016). From the Lokurata Tragedy to Agricultural Involution: An Anthropologist's Observations on Environmental Change and Human Action Patterns in Ngadu Olu Village. *ETHNOHISTORY: Scientific Journal of Culture and History*, 3(2), 229-258.
- Anjani, RW, Purnomo, E., & Hariri, MR (2023). Diversity of Invasive Weed Species in Gymnospermae Vak of Bogor Botanical Gardens. *INSOLOGI: Journal of Science and Technology*, 2(6), 1054-1060.

- Arlianty, D. (2020). The availability of open green space and tree architecture at public senior high schools. In *Journal of Physics: Conference Series*. 1460(012069). DOI: 10.1088/1742-6596/1460/1/012069
- Bitani, N., & NeoBiota. (2022). An impact assessment of alien invasive plants in South Africa generally dispersed by native avian species. *NeoBiota*, 74, 189–207. Retrieved from <https://repository.up.ac.za>.
- Candraningtyas, CF, Karina, R., Mardianto, MB, & Ramadhani, G. (2023). Identification of Invasive Alien Plant Species in Nganggring Tourism Village and Recommendations for Their Management. *Innovative: Journal Of Social Science Research*, 3(6), 9599-9612.
- Coville, W., Griffin, B. J., & Bradley, B. A. (2021). Identifying high-impact invasive plants likely to shift into northern New England with climate change. *Invasive Plant Science and Management*, 14(2), 57-63.
- Fajar, B. S., Hatta, G. M., Fitriani, A., & Ilham, W. (2021). MODEL ARSITEKTUR POHON BERDASARKAN FUNGSI KAWASAN DI SMAN 2 BANJARBARU. *Jurnal Sylva Scienteeae* Volume, 4(6).
- Hamdani, M. F., Achmad, B., & Peran, S. B. (2022). Model Arsitektur Pohon di Arboretum Fakultas Kehutanan Universitas Lambung Mangkurat. *Jurnal Sylva Scienteeae*, 5(3), 480-492.
- Hidayat, M., Pratiwi, O., Sartinawati, R., & Sakti, V. R. (2019, January). Stratifikasi dan model arsitektur pohon di kawasan hutan sekunder Pegunungan Deudap Pulo Aceh Kabupaten Aceh. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 6, No. 1).
- Hidayatullah, A., Widiana, A., & Kusumorini, A. (2021, December). arsitektur pohon beraktivitas owa jawa (*Hylobates moloch*) hasil rehabilitasi di kawasan cagar alam gunung tilu blok gamboeng ciwidey bandung-jawa barat. In *Gunung Djati Conference Series* (Vol. 6, pp. 19-29).
- Hossain, M.A., Bhattacharjee, S., & Kim, H.T. (2021). Ecological and economic impacts of invasive plant species in agriculture: A review. *Journal of Plant Research*, 134(6), 889–899. <https://doi.org/10.1007/s10265-021-01265-6>.
- Indaswara, H., & Suwarna, HK (2023). Inventory of Invasive Plants in the Cipadung Permai Complex, Cibiru District, Bandung City, West Java. *Journal of Plant Science Cluster Research (JURRIT)*, 2(2), 62-67.
- Lu, W., & Chen, Q. (2024). Molecular Mechanisms of Nitrogen-Fixing Symbiosis in Fabaceae. *Legume Genomics and Genetics*, 15. doi: 10.5376/lgg.2024.15.0017

- Mustaqim, WA, Persada, AY, Sari, hP, Putri, KA, & Hariri, MR (2022). Alien Flora of Sumatra I: Ten New records. *Floribunda*, 6(8), 279-287.
- Nkuna, K., Novoa, A., & Richardson, D. M. (2021). The socio-economic and ecological impacts of invasive species in rural South Africa: A case study. *Biological Invasions*, 23, 2873–2887. <https://doi.org/10.1007/s10530-021-02518-4>.
- Novoa, A., Shackleton, R.T., & Wilson, J.R.U. (2021). Assessing the economic impact of invasive alien plants on agricultural production in South Africa. *Agricultural Economics Research*, 57(1), 23–31.
- Palandi, RR (2022). Identification of Weeds in Corn (*Zea mays*, L.) Agricultural Land in Woloan Village, West Tomohon District. *INFO Science Magazine*, 3(2), 72-80.
- Prasetio, R. N., Peran, S. B., & Bakri, S. (2021). Analisis kesesuaian fungsi pohon dan model arsitekturnya di Rumah Sakit Idaman Banjarbaru. *Jurnal Sylva Scientiae*, 4 (1), 138-151.
- Putri, RY, Hardiansyah, H., & Mahrudin, M. (2022). Diversity of Cyperaceae in the Rice Field Area of Tanipah Village as Enrichment Material for the Concept of Biodiversity in the Form of an E-Booklet. *NECTAR: Journal of Biology Education*, 3(1), 9-18.
- Sayfullloh, A., Riniarti, M., & Santoso, T. (2020). Invasive Alien Species Plants in Sukaraja Atas Resort, Bukit Barisan Selatan National Park. *Sylva Lestari Journal*, 8(1), 109-120.
- Sehati, DP, & Solfiyeni, S. (2023). Vegetation Diversity in Habitats Invaded by Invasive Plants in the Bukit Langkisau Painan City Forest, West Sumatra. *UNAND Biology Journal*, 11(1), 29-38.
- Sharma, G. P., & Raghubanshi, A. S. (2021). Invasive species and agricultural ecosystems: An overview. *Environmental Management*, 67(4), 616–624. <https://doi.org/10.1007/s00267-021-01454-y>.
- Shintarika, F. (2021). The Analysis of Vegetation and Inventory of Dominance in Corn Planting (*Zea mays* L.) Generative Phase in the Land of the Lampung Agricultural Training Center. *AgroSainTa Journal: Widyaiswara Mandiri Membangun Bangsa*, 5(2), 49-54.
- Shivambu, T. C., Nentwig, W., & Novoa, A. (2020). Assessing the impacts of invasive plant species on ecosystem services and human well-being: A review of South African case studies. *Global Ecology and Conservation*, 24, e01336. <https://doi.org/10.1016/j.gecco.2020.e01336>.
- Simberloff, D., & Rejmánek, M. (2020). Invasive alien species in agriculture: threats, impacts, and management strategies. *Biological Invasions*, 22(3), 1355–1370. <https://doi.org/10.1007/s10530-019-02171-7>.

- Soimin, M. (2023). ARSITEKTUR POHON PADA AREA RUANG TERBUKA HIJAU KOTA KUPANG PROVINSI NUSA TENGGARA TIMUR. *Wana Lestari*, 5(02), 309-318.
- Solihah, FMA, Hariri, MR, & Turhadi, T. (2024). Mapping the Invasive Alien Species *Hydrocotyle leucocephala* Cham. & Schltl. in Bogor Botanical Gardens. *Bioscience Expert: Journal of Biological Sciences*, 12 (1), 654-661.
- SUDRAJAT, A., & Wiyono, S. (2012). OPTIMALISASI AREA SEKITAR MAKAM KELUARGA PAKUALAMAN MENURUT TINJAUAN JENIS DAN ARSITEKTUR POHON DI BUKIT BANGKEL, YOGYAKARTA.
- Supriyatna, AS, Aulia, AR, & Cahyanto, T. (2022). Inventory of Invasive Alien Plants in the Ir. H. Djuanda Grand Forest Park Area. *Al-Nafis: Journal of Biology and Biology Education*, 2(2), 99-114.
- Suryana, IGPE, & Antara, IGMY (2021). Development of Geographic Information Technology as a Media for Biodiversity Exploration in Indonesia. *Indonesian Journal of Applied Computer and Information Systems (JSIKTI)*, 3(4), 46-55.
- Tarigan, PL (2024). Inventory of Weeds on Several Smallholder Farmers Land, East Java. *Agrocentrum*, 2(1).
- Teixeira, DSJA, Koblianska, I., & Kucher, A. (2023). Agricultural production in Ukraine: An insight into the impact of the Russo-Ukrainian war on local, regional and global food security. *Journal of Agricultural Sciences (Belgrade)*, 68(2), 121-140.
- van Wilgen, N.J., Faulkner, K.T., Robinson, T.B., South, J., Beckett, H., Janion-Scheepers, C., ... & Richardson, D.M. (2022). Climate change and biological invasions in South Africa. In *Invasive species and global climate change* (pp. 158-187). GB: CABI.
- Widyati, E. (2017). Understanding plant-soil communication in the rhizosphere area for land management optimization. *Journal of Land Resources*, 11(1), 33-42.
- Wu, X., Dong, S., Chen, H., Guo, M., Sun, Z., & Luo, H. (2023). *Perilla frutescens*: A traditional medicine and food homologous plant. *Chinese herbal medicines*, 15(3), 369–375. <https://doi.org/10.1016/j.chmed.2023.03.002>.
- Yin, W., Wu, M., Tian, B., Yu, H., Wang, Q., & Ding, J. (2020). Effects of bio-invasion on the Yellow River basin ecosystem and its countermeasures. *Biodiversity Science*, 28(12), 1533.