

ANALYSIS OF THE GREEN LANE IN GAJAH MADA PARK IN MEDAN CITY AS A PUBLIC OPEN SPACE AND DEVELOPMENT EFFORTS A SUSTAINABLE FUTURE

Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

^{1,2,3,4,5}Department of Architecture, Faculty of Science and Technology, Panca Budi Development University Medan Jl. Gatot Subroto Medan, Indonesia

E-mail:<u>Darmanrina888@gmail.com</u>

Abstract

Green lanes are green areas around residential neighborhoods or around cities, which aim to control development growth, prevent two or more cities from merging, and maintain green, recreational, or catchment areas. Smart Green Land is an innovation in the RTH concept that functions as the lung of the city and as a comfortable place through the provision of supporting facilities to create comfort and freshness. This research aims to find out, Studying problems and constraints in the green lane landscape, analyzing problems, developing potential and developing recommendations for sustainable smart green land plans and implementations. Research is carried out on green roads in the city of Medan, and the application of smart Green Land to build a sustainable future. This study uses three stages, namely inventory, data analysis, and data interpretation. The results of the study show that the green lane of Jalan Sei Batang Hari Jalan Gajah Mada and Jalan Sei Batang Panggang are focused on the addition of shrubs, beautiful flowering shrubs, street lighting lamps and seats. Smart Green Land on Jalan Gajah Mada in Medan City and Gajah Mada Park is more focused on adding types of vegetation of flowering plants and grass plants. As well as sports facilities that may be needed in the park as a green open space

Keywords: smart green land, green line, analysis, green open space

1. INTRODUCTION

The development of Medan City has deviated from the original plan. The city of Medan is experiencing the same symptoms, namely the change in land function which was planned as green open space (RTH) to become a built-up area (Niti, Eddy and Mustika, 2011). Open space is space that can be accessed by the public for a limited or unlimited period of time. Green open spaces can take the form of roads, sidewalks, city parks and city forests. The minimum green open space area of 30% is the minimum size of the vegetated area to ensure the balance of the regional ecosystem. The balance of the ecosystem that is maintained is hydrological function, microclimate, the availability of clean air to ensure the needs of its citizens and the absorption of carbon dioxide. In addition, vegetated areas can increase the aesthetic value of the area (Baharudin, 2011). The decline in the quality of urban settlements can be seen from increasingly severe traffic jams, the development of slum areas that are vulnerable to flooding, and the increasing loss of green open space for public access and health. Green open space can be categorized as space where plants grow and are useful, and the types of plants planted in green open spaces are trees, shrubs, bushes, vines and herbaceous plants. Open space has the power to shape the character of a city and maintain the quality of its environment. The urban landscape is a man-made landscape as a result of human activities in managing the environment to meet their living needs (Simonds and Starke, 2006). The green belt is a green area around the urban environment which aims to control development growth and maintain green areas. The main element of the green belt is vegetation which naturally functions as an atmosphere cleaner by absorbing pollutants in the form of gases and particles through its leaves. Vegetation functions as a living filter that reduces pollution levels by absorbing, detoxifying, accumulating and/or



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

regulating metabolism in the air so that air quality can improve by releasing oxygen in the air (Shannigrahi et al. 2003). Smart Green Land is an innovation in the RTH concept on how to make RTH function as the lungs of the city and as a comfortable place by providing supporting facilities in order to preserve the environment. Roadside areas are areas that function for the safety and comfort of road users, land for road development, buffer areas, green lanes, places for construction of service facilities, and protection of natural formations (Carpenter, 1975). Limited green space requires separate regional regulations that regulate policies such as replacing the dividing walls between massive multi-storey buildings with trees and parks that serve as shade so that they can blend with the sidewalks at the edge of the road (Directorate General of Spatial Planning, 2006).

Landscape management is an integrated effort in structuring and utilizing, maintaining, preserving, controlling and developing the environment so as to create a landscape that is beneficial for humans and other living creatures (Arifin, 2005). Management is a process of concepts, theories and goal analysis, namely planning, organizing and carrying out these goals through systematic, coordinative and collaborative human efforts (Kraus and Curtis, 1982). Maintenance is an effort to maintain and care for the landscape area with all the facilities in it so that it remains in good condition or as far as possible maintains it in a condition that is in accordance with its initial purpose and function (Arifin, 2009). Maintenance also aims to ensure that a landscape area has aesthetic beauty as well as being comfortable and safe (Arifin, 2009). Efforts to simplify or support ideal maintenance are as follows: (a) planning the garden with simple patterns so that physical maintenance is easy to carry out; (b) create a clear and rational traffic or circulation pattern so that the flow of activities within it will always run smoothly; (c) choose a strong and durable structural system and choose appropriate pavement materials; and (d) equipping the park with adequate facilities, for example lighting and utility networks.

2. IMPLEMENTATION METHOD

This research was carried out from January 2024 to May 2024 on the green lane of Jalan GajahMada, the green lane of Jalan Sei Batang Panggang and the green lane of Jln Sei Bekala and for the implementation of Smart Green Land specifically at Gajah Mada Park, Medan City. This research used three stages, namely: (1) The inventory stage using the survey method is interviews and literature studies, a survey method used to collect data on the general conditions of the research location and plant diversity; (2) Analysis of data on the general conditions of the research including physical and socio-cultural aspects; (3) Interpretation, namely a descriptive description of the types of plants that exist at the research location and a comparison between the two research locations to prove the hypothesis that has been made and a descriptive description of plant functions, both general and special functions, and accompanied by supporting photos.

3. RESULTS AND DISCUSSION

Designing the Smart Green Land design for the green belt and Gajah Mada Park, Medan City, there are many problems in green open space, namely the increasing lack of green open space to expand public green open space, the drainage system is still poor so water still pools on the ground surface, the addition of biopores. Green open spaces can reduce waterlogging. There are few types of vegetation in green open spaces, which reduces the quality of the park's aesthetic value. Public attention to the importance of green open spaces does not play an active role in maintaining the existence of parks. A park management system that is still inadequate has an impact on poor maintenance of plant vegetation types. The lack of comfort that occurs in green open spaces is due to the lack of facilities in the city square.

97



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

The layout of urban green open spaces must be adapted to environmental conditions that pay attention to aspects of health and beauty, so that the provision of urban parks needs to be included as part of public facilities in providing green open spaces and their benefits, such as fostering freshness, comfort, environmental beauty, reducing pollution, and realizing environmental harmony. The potential of Malang City Square is that it is a strategic place that can be reached by all levels of society. The design of Gajah Mada Park in Medan City which is standing now is very much influenced by the factors of several community shops that live around Medan Gajah Mada Park, this is because during the redesign of Gajah Mada Medam Park, it was greatly influenced by the intervention and thinking of Medan city residents who were aware of the need for green open space for sports activities carried out by the community. The park design concept refers to the sports design with an open space system in Gajah Mada Park. Medan . According to the aesthetics of the curved garden lamp, the design concept meets the beauty criteria, but there are several designs that are appropriate and good based on each function.

Design recommendations for Gajah Mada Park, Medan City, can be seen in Figure 1, where the emphasis is on adding sports facilities to give the impression of an open park to provide comfort in exercising when visiting the park. The physical elements added to the design at Gajah Mada Park include: (a) Playground where children can play with various games such as swings and hallway games; (b) The jogging track is a track for those who like to jog in the morning. With this facility it is hoped that it can improve the health of Malang City residents themselves and tourists who want to enjoy the coolness of Malang City in the morning. It is quite interesting because the jogging track has a neat plot with plants that decorate the garden, making users feel comfortable when exercising; (c) The grass garden is an important part of the garden which is decorated with fountains for air conditioning; (d) The toilets provided must be clean and suitable for use by users, this can reflect the cleanliness and comfort value of the park; (e) This Rest Area is equipped with several supporting facilities.

3.1 Smart Green Gajah Mada Park, Medan City

Green Land Gajah Mada Park, Medan City, has problems, namely the lack of additional facilities in green open spaces, lack of cleanliness or maintenance at Tama, it is necessary to add grass, shrub and herbaceous vegetation types. In the type of vegetation, it is also necessary to add beautiful flowering types of vegetation that have a neat, orderly impression. The irregular arrangement of vegetation causes many obstacles in the process of maintaining vegetation in Gajah Mada Park, Medan City



Figure 1Gajah Mada Park Sketch Before Designing



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵



Figure 2Plant Tub Area





Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵



Figure 4Playground Facilities



Figure 5Fountain Facilities



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵



Figure 6Toilet Facilities

Plants that are resistant and able to control as well as act as traps and absorb pollutants include Mahogany (Swietenia macrophylla), Bisbul (Diospyros discolor), Tanjung (Mimusops elengi), Canary (Canarium commune), Red Meranti (Shorea leprosula), Kirai Payung (Filicium decipiens), Black Wood (Diospyros celebica), Jamblang (Euginia cuminii), Medang Lilin (Litsea roxburghii), and Sempur (Dillenia ovata). Gajah Mada Park has the potential or advantage of being surrounded by office buildings, close to hospitals, school areas, hotels, restaurants and also markets. Its strategic location makes Gajah Mada Park accessible to all levels of society. Taman Gajah Mada, Medan city, can be a place to socialize, equipped with various seating facilities, gazebos, the cool air of Medan City adds to the attraction of coming to Tama Gajah Mada, Medan City, apart from being an icon of Medan City, it is also an element of the city, which is an open space intended for the community and tourists as a place for various kinds of community activities such as sports or as a place to socialize. The design recommendation for Gajah Mada Park (Figure 2) is the addition of beautiful flowering shrub vegetation such as Butterfly Flower (Bauhina purpurea), and also shrub plants such as Asam Landi (Pithecelebium dulce) which can absorb lead particles so that it gives a cool impression. square. This is as explained by Rijal (2008), empowering a green open space can be done by diversifying the plant structure by adding certain types of plants so that the amount of vegetation stratification increases. The arrangement of facilities such as seating and garden lights is also considered so that the public or users of Tugu

Bulletin of Engineering Science, Technology and Industry | Volumes 2 Issue 2 (2024) https://bestijournal.org | PT. Radja Intercontinental Publishing



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

Square can enjoy the green space. Scheduled garden maintenance for vegetation care, ponds and garden cleanliness can help increase the beauty of a garden. In designing Gajah Mada Park, the solution provided was the addition of bush and flowering vegetation types so that they could add aesthetic value and be able to become an attraction for the surrounding community. The addition of shrub vegetation can also give a cool and beautiful impression to the open space. The strategy for developing green open spaces and public open spaces in Medan City includes: (a) structuring green open space according to its functions such as aesthetic, ecological, recreational and educational; (b) planting trees according to the type and function of RTH; (c) placement of green open space to support regional identity; and (d) grouping green open spaces according to their function, hierarchy and environmental spatial scale (Purba, 2002).

3.2 Green Lane Jalan Gajah Mada

The design of the green belt on Jln Gajah Mada has problems, namely the large number of types of vegetation with irregular planting arrangements, which gives the impression of less than optimal aesthetic value. Greenzone jln Gajah Mada has an aesthetic function, namely binding between building elements in the city, providing characteristics in shaping the face of the city and elements in the architectural arrangement of the city of Medan. To maintain the sustainability of the Gajah Mada Greenzone so that it avoids damage, maintenance needs to be carried out involving all existing components, both the city government and the community. The Mada Gajah Greenzone is a natural component that plays a role in maintaining the sustainability of existing processes in the ecosystem. The Mada Gajah Greenzone is seen as having the capacity to support environmental sustainability. Its existence must receive special attention from the community and government.

The solution given to the Gajah Mada green belt is the addition of beautiful flowering shrub vegetation such as Kul banda (Pisonia grandis Alba). The neat arrangement of green lanes with a park management and maintenance system that is emphasized for green lanes and the need to add pedestrians for road users or users can enjoy the green lane facilities on Jln Gajah Mada because there are very few pedestrian lanes and the drainage system is not optimal on the green lane of Jalan Gajah Mada often experiences flooding or stagnant water on the side of the road. Recommendations for designing Medan city green belts include beautiful flowering plant vegetation to add an aesthetic impression. In the design recommendations, types of shrub vegetation and planting arrangements are also added with the aim of increasing the aesthetic value of the green belt, preserving bird habitat, and as a groundwater conservation area. Plants with low evapotranspiration are Sea Pine (Casuarinaequisetifolia), Bungur (L. speciosa). In the recommendations for the Dieng Green Belt, Pule Trees (Alstonia scholaris) should be added as the main constituent and also as shade trees.

3.3 Green Lane Jalan Sei Batang Serangan

Jalan Sei Batang Panggang is one of the western roads in Medan City. The Sei Batang Panggang road section, which is not too wide, still allows for changes to the arrangement of the road's green belt. Activities along the road include education, trade and service activities. On holidays, street sidewalks are often used as a means for sports activities. The arrangement of green lanes along the Sei Batang Panggang road is based on the goals to be achieved and adapted to the character of the local environment so that a highway landscape is formed. To the west of Jalan Sei Batang Panggang, it borders Jalan Sei Bekala, and close to BundaThamrin Hospital, Jalan Sei Batang Panggang. The area along Jalan Sei Batang Panggang is around 2 meters. Roads must meet the aspects of efficiency, safety, comfort and good appearance to facilitate circulation and anticipate the effects such as pollution, noise, heat and discomfort. The problems in the Ijen Green Route are green open space management, inconsistent maintenance of green open space, lack of



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

appreciation and awareness of the importance of green open space, this is in accordance with Ferliana, Azis, and Hartuti (2012) who explain that awareness of the importance of green open space needs to be instilled in order to fulfill human needs in an effort to create a sustainable living environment. The design recommendation for the Ijen green belt stipulates that the King Palm (Roystonia elata) plant should be left as is because this vegetation forms part of the median green lane of the road which is useful as a road guide and not for shade.

3.4 Green Lane Jalan Mayjen Dl Panjaitan

103

Green belt or Green Line, which is also commonly called a green belt, is a form of urban forest that has the function of maintaining the survival of the earth, namely as a medium that has the ability to reduce air pollutants including carbon dioxide (CO2) floating in the air and producing oxygen (O2).) (Iwan, 2009). In 2007, the Malang City area was recorded as having urban forests of 0.5% of the total area of Medan City which reached 265.1 Km2. High city activity is caused by rapid population and industrial growth in urban areas. The negative impacts of city activities include increasing air temperature, noise, dust, pollutants, decreased humidity and loss of habitat for various types of birds and other animals due to loss of vegetation and green open space. Vegetation recommendations are very useful for engineering the environment in urban areas, controlling erosion, ground water, reducing noise, controlling waste water, controlling traffic, dazzling light, reducing light reflections, and reducing odors and also in terms of the beauty of green open space as shown in Table 1 which is a type of vegetation that also supports the aesthetic value of a green open space and the benefits of the existence of plant parts such as leaves, stems and roots which are very useful in controlling various environmental discomforts caused by human activities. Leaves with hairs and stomata are able to provide coolness and reduce dust through the process of transpiration and holding particles in the air. Stems and leaves are able to dampen sound.

Flowers can provide aesthetic value. Plant roots can resist the rate of erosion and provide groundwater reserves. The problem that exists on the green belt on Jalan Mayjen Dl Panjaitan is that there is a lot of plant vegetation that is planted randomly and irregularly or poorly organized. According to Arif and Parfi (2013), it can be seen from the same and uniform height, the leaves are dense, the canopy is quite shady and compact, the stem is strong, upright, does not break easily, the stem and branching system are strong, and the type of plant is an evergreen plant. Rrecommendations for plants that can live in urban forests from trees, shrubs and ground cover, so that they can form a community that functions as an erosion barrier. Efforts to select plant types are directed at improving plant function with the aim of preventing flooding and erosion, improving and maintaining sustainable land productivity and improving the socio-economic welfare of the community. From the results of interviews with various respondent agencies, urban forest on Jalan Jakarta turns out to be the arrangement of vegetation in the urban forest for aesthetic purposes and has not considered ecological or functional functions.



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

No.	Local Name	Latin name
a.	Andong	Cordyline fruticosa
b.	Red Shoot	syzygium myrtifolium
c.	ribbon plant	Chlorophytum laxum
d.	Paper flower	Bougainvillea.
e.	Croton	Codiaeum variegatum
f.	White Cambodian Flower	Wrightia Religiosa
g.	Lucky Bamboo	Dracaena Sanderiana
h.	purple heart	Tradescantia Pallida
i.	Mangkokan leaves	polyscias fruticosa
j.	Big-billed Bird Flower	Heliconia Psitta Corum
k.	Maki	Podocarpus Macrophyllus
1.	Peacock Flower	Caesalpinia pulcherrima
m.	Spiny Elaegnus	Elaeagnus Pungens
n.	Jerusalem Cherry	Solanum Pseudocapsicum Variegatum
0.	Frangipani flower	Adenium obesum
p.	Blood Sambang	Excoecaria cochinchinensis
q.	Soka	Ixora coccinea
r.	Memories	Canangium odoratum baill
s.	Zamia curcas	Zamioculcas zamifolia
t.	Nusa Indah	Mussaeda philippica L
u.	Begonia	Begonia laciniata roxb
v.	Lily Paris	Chlorophytum
w.	Jasmine	Jasminum sambac L. wait
х.	Bougainvillea	Bougainvillea spectabilis
y.	Taiwan Beauty	Cuphea hyssopifolia hbk

Table 1 Local Names and Latin Names of Ornamental Plants in Gajah Mada Park, Medan

Table $=$ Documentation and Dather ranges of theory in Kint infiniting only

Local name	Latin name	Local name	Latin name
Acacia	Acacia auriculiformis Cunn	Coconut	Cocos nucifera L. Var
	ex Benth		subglobosa
			(Arec)
Angsana	Pterocarpus indicus Wild	Longan	Dimocarpus longan (Lour.)
			Steud
Sour	Pithecelobium dulce Roxb. Benth	Candlenut	Aleurites moluccana (L.) Wild
Sour	Adarsonia digta Linn	Walnut	Canarium sp. (Burs.)
Dutch			
Banyan	Ficus benjamina L.	Kiara	Fillicium decipiens (Blume)
-		Umbrella	Hook F &
			Thomson
Rubber	Ficus elastic Roxb. Ex Hornem	Kluwih	Artocarpus camansi (Park.Fsb

104

Bulletin of Engineering Science, Technology and Industry | Volumes 2 Issue 2 (2024) https://bestijournal.org | PT. Radja Intercontinental Publishing



Erliyanti Novarina Halawa¹, Disa Pentaloka Br Sembiring², Cris Yobel Situmorang³, Andika Alnas Aldito⁴, Wendista Zebua⁵

Banyan			
Wind Pine	Casuarina rumpiana Miq	Mango	Mangifera indica L.
	(cas)		
Sea Pine	Casuarina equisetifolia L	Matoa	Pometia pinnata J. R & G.
			Fors
Local	Polyalthea longifolia pendula	Handkerchief	Maniltoa brawneodes Scheff
Glodokan			
Glodokan	Polyalthea longifolia Sonn	Little Sawo	Manilkara kauki (L.) Duby
Mast			(Sapot)
Water	Eugenia aquea Burm F	Sengon	Albasia falcataria (L.)
apple			Fosberg
Guava	Psidium guajava Linn	Sengon Butho	Antocephalus chinensis (Lam)
		-	Rich.
			(Rub) ex. Walp

4. CONCLUSION

The results of the research are based on the results of the questionnaire obtained on the green lane of Jalan Gajah Mada, Jl. Mayjen Dl Panjaitan which is more focused on arranging trees and adding du flower bushes along the green lane, while the implementation of Smart Green Land in Gajah Mada Park, Medan City is more focused on adding sports facilities. and flowering and grassy vegetation types. There is a tendency for the quality of green open spaces to decline, most of which have been converted into buildings, new residential areas and shopping centers. In an effort to make green open space comfortable, productive and sustainable, special attention is needed to establish regulations regarding standards for setting up green open spaces as well as efforts by the government and community to plant trees to reduce negative environmental impacts. The arrangement of green open spaces in urban areas is part of the arrangement of open green spaces which function as urban gardening green areas, urban forest green areas, sports activity green areas, cemetery green areas, agricultural green areas, green belt green areas and yard green areas.

REFERENCES

- Arif R. And Parfi K. 2013. Adequacy of Vegetation on MT Road. Haryono City Semarang. PWK Engineering Journal, Vol. 2, no. 1, 2003, 124-132.
- Arifin, HS and NHS Arifin. 2005. Park Maintenance. Printed VIII Revised Edition. Self-Help Spreader, Jakarta. 169 p.
- Arifin, HS, A. Munandar, NHS Arifin, Q. Pramukanto, and VD Damayanti. 2007. Sampoerna Hijau Kotaku Hijau: Guidebook for Arranging Public Parks, Planting Plants, Handling Waste and Community Empowerment. 188 p.
- Arifin, HS, 2009. Diktat for Landscape Management Lectures. Bogor Agricultural Institute. 151 p.
- Baharudin, A. 2011. The Need for Green Open Space in the Central City Area of Jayapura. Sustainable Earth Journal 11 (2): 297-305.

Carpenter, PL, TD Walker, and FO Lanphear. 1975. Plants in the Landscape. WH Freemann And Company. San Francisco. 468 p.

- Directorate General of Spatial Planning, 2006. Green Open Space as a Main Element of City Spatial Planning.
- Ferliana N, Azis NB, and Hartuti P, 2012. StrategyEnhancement And Providing Green Open Space. ECOSCIENCE Journal. Vol. IV. No.3.