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Research Article

Evaluation Bekasi Urban Forest Facilities as Green Open Space

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Abstract. This research is motivated by the increasing needs of the community in the use of land through of construction of various facilities that have an impact on the reduction in the area of green land that has changed function and it is used for various facilities that are expected to be able to increase the quality of comfort, health, and environmental security to provide easy access to the implementation and monitoring of various activities. The aim of this research is to identify and evaluate availability and function of facilities. Data collection was carried out through field observation techniques, interviews, documentation, and literature studies carried out since 2022 to 2026. Data explanation using quantitative and qualitative descriptive methods includes determining factors of the quality of green open space that influence sustainable environmental development. The results of this study indicate that this urban forest has become a green open space, resulting in some damage to the available facility components due to lack of maintenance, supervision and management, as well as repairs carried out inappropriately, thus reducing the functional value of the facilities and infrastructure and they cannot be used as they should, resulting in a decline in the quality of this urban forest.

Keywords: Urban Forest; Facilities; Sustainable Development; Green Open Space; Environmentally Friendly.

1. Introduction

In the past, this city forest was filled with various lust trees which were used as one of the gathering areas since the struggle against colonialism towards Indonesian independence which was marked by the existence of a struggle monument that was established in 1975 which was inaugurated by regent Abdul Fatah then built by Solihin then made a cultural heritage according to the decree of the mayor of Bekasi No. 31 (Izzati & Pamungkas, 2023). This city forest underwent a redevelopment which was inaugurated by the Governor of West Java led by Solihin G.P, then made as one of the cultural heritages in accordance with the Decree of the Mayor of Bekasi No. 31/Kep 255.Porbudpar/VI/2011. As time goes by, the Struggle Monument Park changed its name and function to the Patriot Bina Bangsa Camping Ground due to its function as one of the gathering places for youth organizations of nature lovers and sports so that it changed its function to a campground which is used as a gathering place and camping as well as carrying out various youth activities in the form of scouting activities, nature lovers which are marked by the presence of a building providing material for nature lovers, and scouts, historical tours through monuments, historical monuments. As well as various sports activities, such as jogging, fitness, and gymnastics. The Patriot Bina Bangsa City Forest Camping Ground was built and inaugurated again in 2012 by Dr. Rahmat Effendi, who at that time served as mayor of Bekasi, with the Decree of the Mayor of Bekasi No. 032/Kep.459–BKAD/XI/2012 issued on November 14, 2012 concerning the allocation of the budget for the development of regional assets in the city of Bekasi refers to the Regulation of the Minister of Public Works No. 5 of 2008 concerning the provision of Green Open Space as a social and aesthetic facility (Sari et al., 2025). It changes in the use of urban forest land occurred when urban forests were designated as city parks in 2012. It has changed to 6,4 Ha, then has now turned into a city park which currently has a green area of around 3 Ha (Marshinta & Budhianti, 2022). The development of this urban forest is based on the latest spatial and regional planning for Bekasi

City for 2024 to 2044 and the strategic plan of the Bekasi City Environmental Agency for 2024 to realize a green city through the ecopark concept. The selection of this urban forest is based on historical, ecological and community needs related to public space, as well as how to utilize this green forest area which has several supporting facilities that have been built long ago but have experienced changes in governance and function that have influenced the image of Bekasi city and its impact on the surrounding environmental conditions, both positive and negative.

The degradation of this green area occurs along with the development of the times. The level of vegetation distribution in Bekasi City in 2021 decreased to the high category with an area of 6,889 ha, especially in western Bekasi. The percentage of existing green open space in Bekasi City also decreased from 2013 to 2021 by 8% or 1,728 ha in January 2021, and the area of green open space that has been optimized for spatial planning has only reached 2.42% or 525 ha, with the dominant types of green open space being city green open space and public cemetery green open space (Pambudi & Tambunan, 2021).

Curently, this city forest has become a green open space that has undergone several changes through the conversion of green land functions into a space for various health support facilities in the form of sports facilities, education, such as scout/nature lovers learning spaces, nursery spaces, compost, and social facilities including playgrounds and their equipment and various trade facilities to improve the quality of life and community interaction in the city forest environment (Mutia & Idawati, 2021).

Identification, evaluation of the condition and function of available urban forest facilities is a way of managing assets that must be carried out to anticipate obstacles/constraints from emerging problems in order to obtain effective and efficient solutions in maintaining the sustainability and preservation of available resources so that they can support the goals of the SDGs and create a healthy and conducive environment (Realita & Angestiwi, 2023).

2. Method

This city forest is located at coordinated 106.991.780 East Longitude, and -6.235.219 South Latitude. This is in accordance with the map of the Bekasi city government's spatial planning and area service located in Kayuringin Village, South Bekasi District. This forest is located on Boulevard of Ahmad Yani No. 2, West Java 17144. This forest is the only one of green area in the middle of the city in center of Bekasi. This research was conducted during 2023 to early 2026.

The method used is a quantitative and qualitative descriptive approach, describing the environmental conditions of urban forests in greater detail to assess their quality and to evaluate the research findings explain data analysis with information description through data collection by reducing all data obtained from primary data from field observations, interviews from many sources, and documentation of each element based on certain considerations, as well as a secondary data derived from data obtained from agencies, as well as literature studies related to research to obtain conclusions by using determining factors for quality green open space consist of natural surrounding especially focused on natural vegetation resources, landscape elements, facilities, ambiance & aesthetic, recreation & play, contack with nature, safety, spaces & design, citizen participation & community identity, accessibility, social preferences & interaction.

The tools and materials used in this research include:

1. A mobile phone equipped with a GPS (Global Positioning System) and maps.
2. Stationery including pencils, pens, paper, and a guidebook.
3. A camera for research documentation.
4. A laptop.
5. A printer.
6. Books and papers related to this research.

3. Result and Discussion

3.1. Urban Forest Condition

Along with changes and developments in the era. Various facilities have been built that can help facilitate the activities of visitors and managers so that is expected to support improving the quality and comfort of activities in this city forest. Green open space in Bekasi has experienced a decline in the area, quantity, variety, and quality of available vegetation due to the conversion of land use, management, and land use to building sites. Therefore, legal provisions and policies are needed to address working principles, as well as the implementation of green infrastructure development that reduces CO_2 emissions, produces more O_2, mitigates the negative impacts of environmental damage, and provides greater benefits to the environment (Ajrina & Kustiwan, 2019).

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Urban forests have a greater influence on the quality of air, water, and biological environment in people's lives because they have a greater quantity of natural resources compared to green open spaces. While green open spaces have higher social and cultural values in people's lives because they provide various facilities that aim to increase comfort and satisfaction in the community that is influenced by the increase in emotional (mental) needs of the community in the area, as well as resulting in increased physical and mental health of the community through participation between communities and the creation of healthy cooperative relationships, as well as reducing levels of pollution, temperature, and psychological recovery: improving mental health (relieving stress, eliminating fatigue) of visitors to improve the emotional quality of the community in the area (Liu et al., 2022).

The development of public parks is a social, economic, ecological, and ethnoracial aspect of urban development. Park development requires government involvement and the active participation of all levels of society in planning, implementation, and governance and utilization to avoid future problems and meet community needs and satisfaction (Sahakian & Anantharaman, 2020).

3.2. Urban Forest Facilities

Several facilities that have been built include primary, secondary and functional facilities which are places for various community interest.

1. The gate (Figure 1) as an access in and out of this city forest consist of of 4 doors that can be accesed by the public, both access doors can be passed by 4-wheeled vehicles, while the other 2 access doors can only pass 2-wheeled vehicles. All of access is open from 07.00 AM to 08.00 PM. In addition to this access, there are several other accesses used by public due to damage to the fence in several parts of the edge of the forests, and can be through I concrete bridge with a wooden pattern and 11 bridges made of wood as connecting roads that can only be used by pedestrian because they only have a bridge width of about one meter which is located between forest cafetaria area and boulevard of Guntur area which can be used anytime but its condition is quite worrying. There is vertical garden that functions as a forest boundary in a damaged condition due to visitor activities. It is best to build a vertical garden use vegetation that has strong roots, stems, leaves, non toxic, non invasive, anti allergenic, and resistant to changes in weather, humidity, temperature, and the activities of various living creatures, especially the uncontrolled behavior of visitors.



Figure 1. Main Gate of Bekasi Urban Forest

2. Sanitation and hygiene facilities consist of several trash bins of three types, namely organic, non-organic, and hazardous materials (Figure 2b), as well as cleaning equipment scattered throughout the area. However, their placement is not adjusted to the number of visitors, and the abundance of animal and plant resources in the vicinity. In the form of public toilet areas located in three locations (Figure 2a). The first toilet is inside the mosque area which is on the outer edge next to the cafeteria, and the back door next to the sports building managed by the Bekasi City Youth and Sports Agency, this area is the cleanest compared to the others, and the second toilet is next to the mosque in the middle of the inner edge of the forest managed by the Bekasi City Environmental Agency. And the third is located near the technical implementation unit. As a result, cleanliness is less maintained, which is also influenced by the lack of supervision and maintenance. This can be seen from

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the dirty clean water tank, clogged water drains, and damaged water taps, doors, and bathroom ceilings. In addition, toilets intended for users with a capacity of more than fifty visitors with an area of approximately 72 meters according to the regulation of the Minister of Tourism and Creative Economy No. 2 of 2021 concerns Operational Guidelines for the Management of Physical Special Allocation Funds should provide a watertight septic tank with dimensions of 4.4 meters long, 2.2 meters wide, and 2 meters high with a minimum distance of 5 meters from rainwater reservoirs and 10 meters from clean water wells based on national standards to reduce negative environmental impacts (Kementerian Pariwisata Indonesia, 2021).



Figure 2. (a) Rest Room, (b) Trash Bin

3. Sport facilities include air walkers, cardio and pull up tool for fitness, and miniature rock climbing for children's areas in a condition that is still suitable for use in the play ground and sports areas, and basket ball halls, international skate track arena (Figure 3a) and equipment (Figure 3b) as well as training and competition are currently undergoing renovation repairs the management of the Bekasi city youth and sports service. Requiring regular maintenance to check the quality and quantity of equipment according to the conditions of interest and community needs.



Figure 3. (a) International Skate Track, (b) Sports Equipment

4. Entertainment facilities and playgrounds are located in several different locations that have several game and sports equipment (Figure 4a). Some of them is intended for children, such as rainbow circular staircase in decent condition consisting of slide play equipment, miniature rock climbing and mini pull ups that still require mattresses as a base around these play equipment to reduce the negative effects of the level of accidents that can be caused which are located in the playground on the outer edge of the roller-skating competition arena. In 2024, a pedestrian bridge (Figure 4b) was built to add play facilities and change the design of the land, but the existence of the bridge reduces the ecological value for the sustainability of this forest because it cuts down many trees that have grown for decades and in terms of construction this bridge is less environmentally friendly because it is not safe for all visitors, especially for the elderly, pregnant women, toddlers, children, mothers carrying babies, and people with disabilities because its construction is made of iron that can make noise when exposed to friction and high pressure, and is prone to corrosion, as well as the condition of the bridge walls which are a combination of knitted ropes that are easily swayed and vulnerable to impacts. In addition, the wooden steps are easily rotted with age. Therefore, regular maintenance and supervision are necessary to ensure the safety and comfort of its use. These fasilities are widely used in the afternoons, towards the weekends, and during national holidays.

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Figure 4. (a) Playground, (b) Suspension Bridge

5. Transportation facilities include a parking lot that can be used for 2 and 4 wheeled vehicles with several parking attendants when there are lots of tourists visiting, bus stop station (Figure 5a), sidewalk, and dum truck with water tank for watering vegetation (Figure 5b) and pick up car and garbage collection and disposal vehicles for mobilization and maintenance operation ranging from transporting organic and non organic materials to the entire forest and other place which consider public servent unit under environmental department but currently the condition of both vehicles cannot be used optimally because the engine is broken without regular inspection and balance.



Figure 5. (a) Bus Stop Station, (b) Water Tank Truck

6. Forest maintenance facilities include the technical unit office which is tasked with managing the entire forest area and its equipment which operates according to office hours start from 08.00 AM to 04.00 PM with a break time of 12.00 AM to 01.00 PM but the realization the operation is often not according to that time (Figure 6a). This unit have 27 employees, dominated by field cleaners. Furthermore, the composting room functions convert organic waste into compost, and reduce the accumulation of organic waste produced in the forest, then the nursery room functions for nursery, maintenance to plant enlargement (Figure 6b). However, the composting and nursery and maintenance rooms do not function properly due to lack of land management and lack of sunlight reaching the nursery area, thus increasing humidity and reducing the process of photosynthesis, thus affecting the growth and development of existing vegetation which is low, lack of competence and consistency of staff in managing the room and utilization of available natural resources. This is indicated by the absence of a composting and nursery maintenance & management division. Thus, indicating a lack of knowledge and consistency in its management. In addition, there is a hydroponic pot pipe building as a planting medium built by several students in conducting vegetation development research that can be used for ongoing research which is still in good condition. However, existing problems can be minimized by providing a means of criticism and suggestions for users as a fairly effective communication tool, and it is necessary to carry out open collaboration, coordination, and cooperation with more credible educational and research institutions in the management and development of these facilities.

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Figure 6. (a) Technical Service Unit, (b) Nursery Room

7. National Heritage, historical monument tells the story of the struggle from the Karawang and Bekasi people use sharpened bamboo as weapons to help the Indonesian nation gain independence against the colonialist (Figure 7). These historic building is located in the main fence wall of this forest city and around the monument pool. The monument relief on the pool needs to be preserved by coloring it according to its original color and some of the colors and shapes of the bamboo should be adjusted to the color of the bamboo in general.



Figure 7. Historical Monuments

The monument and building reliefs depicting the methods and weapons in the form of sharpened bamboo used in the struggle to seize independence from colonialism. The monument serves as a reminder of the struggle of the people of Karawang and Bekasi and to commemorate the services of the fallen heroes. It has historical value and appeal that influences cultural growth and as a tourist attraction within the authority of the Bekasi city tourism office. Around this area, tribute ceremonies are regularly held during official roll calls and on the anniversary of Bekasi city and national Independence Day.

8. Nature reserves, in the form of diverse flora and fauna as well as cultural reserves that include the design of the walls at the main gate, and the monument in the middle of the main pool resembling a sharpened bamboo stem, as well as historical monuments as symbol of culture and history to commemorate the struggle of the Bekasi people during the struggle for independence in the past. This is a tourist attraction that can be used as a learning experience and needs to be preserved for future generations.

This is accordance with the policies of the governor of west java and the mayor of Bekasi since 2011 to 2018. Based on the information board installed on the side of the main road adjancent to the main gate of this city forest, according to the results of research by technical unit of Bekasi Forest city, there are 23 types of tree vegetation that live in the green area of this city forest. Whereas previously recorded at 23 species according to information obtained through information boards based on environmental service data up to 2026 (Table 1) which are located near the main entrance of this city forest which has been described in the results of previous research in 2023 totaling 7643 vegetation (Table 2) dominated by mahogany plants with an important value index level of 97% with a total of 4000 trees. The calculation of the importance value index indicates that there is vegetation dominance in this forest with total species diversity value of 1.651, and H max value is 151.7 with the total number of species evenness indexes is 0.213 which indicates a low value of species evenness and diversity of vegetation community types.

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Table 1. Species Vegetation Bekasi Urban Forest In 2023

No	Local Name	Scientific Name	Qty	INP	H′	H Max	E
1	Mahoni	*Swietenia mahagoni*	4000	97	0.339	11.97	0.028
2	Tanjung	*Mimusops elengi*	2000	51	0.351	10.97	0.032
3	Asam Jawa	*Tamarindus indica*	200	29	0.095	7.644	0.012
4	Ketapang	*Combretaceae*	100	7.7	0.057	6.644	0.009
5	Biola Cantik	*Ficus*	60	6.8	0.038	5.907	0.006
6	Kecapi	*Sandoricum koetjape*	50	4.5	0.033	5.644	0.006
7	Sengon Laut/Wijen	*Parasenrianthes falcaria*	70	7	0.043	6.129	0.007
8	Kupu – Kupu Merah	*Oxalis Triangularis*	20	3.4	0.016	4.322	0.004
9	Akasia	*Acacia auriculformis*	50	7.2	0.033	5.644	0.006
10	Trembesi	*Samanea saman*	50	6.5	0.033	5.644	0.006
11	Kembang Kuning	*Mammilaria crinite*	100	7.7	0.057	6.644	0.009
12	Karet	*Hevea brasiliensis*	98	7.6	0.056	6.615	0.008
13	Bintaro	*Cerbera mangas*	100	7.7	0.057	6.644	0.009
14	Mangga	*Mangifera indica*	100	7.7	0.057	6.644	0.009
15	Angsana	*Pterocarpus indicus*	150	8.8	0.077	7.229	0.011
16	Sukun	*Artocarpus altilis*	75	5.3	0.045	6.229	0.007
17	Jati Emas	*Tectona grandis*	80	7.2	0.048	6.322	0.008
18	Pisang	*Musaceae*	50	4.5	0.033	5.644	0.006
19	Ekaliptus	*Eucalyptus*	50	4.5	0.033	5.644	0.006
20	Belimbing	*Aveerrhoa carambola*	60	4.8	0.038	5.907	0.006
21	Waru	*Hibiscus tiliaceus*	55	4.6	0.036	5.781	0.006
22	Durian	*Durio*	50	4.5	0.033	5.644	0.006
23	Rambutan	*Nephelium lappaceum*	75	5.3	0.045	6.229	0.007
	Amount		**7643**	**300**	**1.651**	**151.7**	**0.213**

According to the table 1 and 2, it is known that in 2023 and 2026 there was an increase in the diversity of vegetation types compared to the previous year, but the results also showed a decrease in the number of each type with the overall number of available vegetation with a total of 2725 vegetation showing small height and body volume of each vegetation. The results also illustrate a decrease in the amount of water absorption and pollution capacity of urban forests due to the decrease in the area of vegetation areas. Thus, affecting the increase in the potential for flooding in the area and its surroundings. Therefore, , it requires additional water absorption areas are needed in the form of infiltration wells to replace the function of plants as lost water absorbers, and the addition of plant types to help reduce environmental pollutant, as well as the creation of organic wells to increase soil nutrients that affect the increase in soil and plant fertility, and help anticipate flooding because the majority of plants currently available are classified as having a low water and pollution absorption capacity. Thus, increasing the potential for flooding in the area and its surroundings. And this method also helps reduce drought and pollution in the surrounding area. In addition, the calculation was also carried out to show the development and change in the function of urban forests which are currently changing function into green open spaces and increasingly changing function into Bekasi city parks.

Mahogany is characterized by its high carbon dioxide absorption capacity, pollution absorption, and climate mitigation. This plant requires only a simple maintenance system, as it does not require special care because it can survive in extreme soil and weather conditions. Therefore, it can live for hundreds of years, and maintenance costs are minimal. In addition, mahogany wood functions as one of the main materials for sturdy and economically valuable furniture, and its seeds can also be used as medicine for various diseases, making it economically valuable and easily traded. However, this plant has an impact on reducing biodiversity levels and reducing soil health because the characteristics of this tree have leaf litter that is difficult to decompose, so it is not favored by earthworms that function to increase soil fertility, so it does not provide sufficient food for local fauna. Thus, disrupting the balance of the local ecosystem.

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Table 2. Species Vegetation Bekasi Urban Forest In 2026

No	Local Name	Ilmiah Name	Qty	INP	H'	H Max	E
1	Mahoni	*Swietenia mahagoni*	1000	76.4	0,37	9.97	0.037
2	Talas	*Esculenta*	150	13.9	0.16	7.23	0.022
3	Tanjung	*Mimusops elengi*	500	24.9	0.31	8.97	0.035
4	Pucuk Merah	*Syzygium myrtifolium*	15	4	0.03	3.91	0.007
5	Asam	*Tamarindus indica*	50	6.57	0.07	5.64	0.013
6	Jamur Kayu	*Ganoderma lucidum*	5	1.97	0.01	2.32	0.005
7	Ketapang	*Terminalia catappa*	25	5.52	0.04	4.64	0.009
8	Seri	*Mutingia carabula*	20	4.37	0.04	4.32	0.008
9	Biola Cantik	*Ficus*	40	5.65	0.06	5.32	0.012
10	Daun Pepaya Jepang	*Cnidoscolus aconitifolius*	50	8.14	0.07	5.64	0.013
11	Kecapi	*Sandoricum koetjape*	10	3.63	0.02	3.32	0.006
12	Nangka	*Artocarpus heterophyllus*	25	4.74	0.04	4.64	0.009
13	Sengon Laut	*Parasenrianthes falcaria*	25	4.74	0.04	4.64	0.009
14	Randu	*Ceiba pentandra*	25	4.74	0.04	4.64	0.009
15	Kupu Kupu Merah	*Oxalis triangularis*	30	5.1	0.05	4.91	0.01
16	Bunga Kamboja	*Plumeria*	55	6.94	0.08	5.78	0.014
17	Akasia	*Acacia auriculformis*	35	5.12	0.06	5.13	0.011
18	Lili Perdamaian	*Spathiphyllum*	50	6.57	0.07	5.64	0.013
19	Trembesi	*Samanea saman*	15	3.02	0.03	3.91	0.007
20	Jahe Kepala India	*Coctus spicatus*	100	11.9	0.12	6.64	0.018
21	Kembang Kuning	*Mammilaria crinite*	55	7.22	0.08	5.78	0.014
22	Adam Hawa	*Tradescantia spathacea*	55	7.22	0.08	5.78	0.014
23	Karet	*Hevea brasiliensis*	25	4.07	0.04	4.64	0.009
24	Boni	*Antidesma bunius*	20	3.55	0.04	4,32	0.008
25	Bintaro	*Carbera mangas*	25	4.74	0.04	4.64	0.009
26	Mengkudu	*Morinda citrifolia*	20	4.37	0.04	4,32	0.008
27	Mangga	*Mangifera indica*	25	4.47	0.04	4.64	0.009
28	Kelapa Gading	*Cocos nucifera*	25	4.47	0.04	4.64	0.009
29	Angsana	*Pterocarpus indicus*	35	5.47	0.06	5.13	0.011
30	Kelapa Sawit	*Elaeis*	20	4.37	0.04	4.32	0.008
31	Sukun	*Artocarpus altilis*	15	4	0.03	3.91	0.007
32	Rambutan	*Nephelium lappaceum*	20	4.37	0.04	4.32	0.008
33	Jati Emas	*Tectona grandis*	20	4.37	0.04	4.32	0.008
34	Durian	*Durio*	15	4	0.03	3.91	0.007
35	Pisang	*Musaceae*	15	3.02	0.03	3.91	0.007
36	Waru	*Hibiscus tiliaceus*	25	4.74	0.04	4.64	0.009
37	Ekaliptus	*Eucalyptus*	20	3.55	0.04	4.32	0.008
38	Belimbing	*Averrhoa carambola*	20	4.37	0.04	4.32	0.008
39	Jamblang	*Syzygium cumini*	10	3.63	0.02	3.32	0.006
40	Glondokan	*Polyalthia longifolia*	35	5.47	0.06	5.13	0.011
	Amount		**2725**	**300**	**2,57**	**198**	**0,45**

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Based on the latest research results described in table 1 through Shannon-Wiener (H') and Simpson (D) calculations with the calculation results producing an Important Value Index (INP) of "76.4" which states the level of dominance of mahogany species of 76.4% over other species in a plant community in this urban forest area, and the mahogany diversity index symbolized by the H' value is "0.37" and the E value is "0.037" which states that the biodiversity value in this urban forest is classified as "Low". However, for the overall level of vegetation diversity in this urban forest area, the value "H' = 2.57" which means that the level of diversity is classified as "Medium" because the Shannon-Wiener (H') diversity index value criteria are as follows: H'<1= "Low" diversity. 1<H'<3= "Medium" diversity. H'>1 is classified as "High". With an overall E value (Species Evenness Index) of "0.45" which states that the evenness index is classified as "Moderate", there has been an increase in vegetation evenness compared to the previous year of 0.213. This shows that the E value > 0.3 proves that there has been an increase in the evenness and diversity of vegetation which is getting better compared to the previous year, because the sum of the E values is close to 1 as a consideration in making appropriate sustainable urban forest management policies. The vegetation that dominates this urban forest resembles the Kampung Dukuh urban forest in East Jakarta, which is also mahogany. This differs from the dominant vegetation in the Pondok Kelapa urban forest in East Jakarta, which is glondokan trees.

Vegetation analysis in Pondok Kelapa city forest found 6 species consisting of 5 families. While in Kampung Dukuh city forest found 10 species consisting of 6 families. The Importance Value Index (IVI) in Pondok Kelapa city forest shows the highest IVI value is found in Folianthea longhigolia with a value of 80.9%, while the lowest Importance Value Index is found in Magnolia x alba and Phylanthus emblica with a value of 11.39%. Meanwhile, the IVI in observations in Kampung Dukuh city forest the highest IVI value is found in Swietenia mahagoni with a value of 92.9%, while the lowest Importance Value Index is found in Ceiba pentandra with a value of 17.89% and Delonix regia with a value of 11.59% (Handayani et al., 2021).

In addition to these plants, it is also advisable to provide several types of plants that are able to absorb groundwater and air pollution, including banyan trees (*Ficus benjamina*), sugar palm trees (*Arenga pinnata*), bald cypress trees (*Taxodium distichum*) which are very tolerant of waterlogging, as well as poplar & willow trees (*Populus/Salix*) for hydraulic control of contaminated soil & groundwater cleaning. In addition, there are several types of ornamental plants that also function the same, including bamboo palms (*Chamaedorea seifrizii*), snake plants (*Sanseviera*), and English ivy (*Hedera helix*). As well as several plants that are suitable for wetlands/watery areas, including: lotus (*Nelumbo nucifera*), water hyacinth (*Eichornia crassipes*), vetiver (*Vetiveria zizaniodes*), apu wood (*Pistia stratiotes*), water lettuce (*Nasturtium officinale*).

9. Economic and trade facilities are scattered around the inner and outer forest areas in the form of easily assembled and dismantled tents. However, most of the trade activities of goods and services are around the food court area consisting of several kiosks sell various types of food, beverage in cafetaria and some of the kiosk sell many kinds of cloths, and sports equipment, as well as various games and rides with various payment methods elsewhere around the forest. In 2024. several containers were built in the playground area to increase economic activity in this area (Figure 8a). However, the buildings lacked strong foundations, were not painted with anti-rust agents, and were not located facing a busy open space. Furthermore, the roofs used asbestos, which, although resistant to heat and corrosion, can cause asbestosis, lung disease, and inflammation due to the inhalation of microscopic fibers from asbestos deterioration over several years, making it unsafe for health and less helpful in increasing trade output. This is evidenced by the fact that the containers have not been used properly even though the buildings have been standing for a year. As many as 25 buildings are unmaintained and unused, resulting in a waste of the construction budget due to low labor productivity. This commercial and economic activity is often bustling with visitors from Friday afternoons through Sundays, reaching 3 p.m. Peak traffic is generally on Saturday and Sunday mornings until midday (Figure 8b). This situation also serves as a tourist and entertainment attraction, supporting the Sustainable Development Goals (SDGs) of creating decent jobs and economic growth, thereby improving the ecological health of Bekasi's residents.



Figure 8. (a) Container Boxes, (b) Trading Activities

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10. Security and comfort facilities include a police station on the edge of the forest, and cctv equipment, scout couching room, public service unit, and parking service. It helps monitor the order and condition of the environment around the forest (Figure 9). However, these facilities are not sufficient to solve safety problem because the quantities and qualities of the support system are not cover entire areas due to the limited competence of the equipment used and authorized personnel. This is especially true during evening hours or rainy day when the conditions are dark and there are many visitors. Electricity and telecommunications, in the form of computerization and wifi networks, which are only allowed for the management. It would be better wifi access was also provided for researche purposes which could help improve the quality of services as a public open space, while the facilities that area allowed for the public. Lighting and WIFI access is the priority installation and it is needed especially during cloudy weather condition, eclipse and towards the evening and research goal.



Figure 9. Police Station

11. The worship facilities consist of two building mosques along with prayer equipment such as al-qur'an, sarongs, prayer robes, and prayer mats for muslim worshipper, along with various sanitation and hygiene supplies for use by staff and surrounding community. The first mosque is located next to the second gate (Figure 10a) as the entrance and exit to the forest, it appears quite clean and comfortable due to its elevated location above the surrounding area. It also boasts air conditioning, cleaning supplies, and maintenance personnel who regularly monitor and perform their duties. The mosque has two floors, with floor foundations over 1.5 meters high, so it safe froom flooding. The second mosque located in the middle of the forest (Figure 10b) appears poorly maintained and requires immediate repairs in several parts of the building due to flooding and extreme weather conditions. This is due to a lack of maintenance and supervision. This is evident in several damages to the roof, walls, and floors of the building due to seepage and leaks during rain and flooding that have occurred several times, as well as damage from termite/insect and fungal activity. This has resulted in a lack of visits and use of this mosque. Therefore, the necessary actions include replacing several damaged roof tiles, providing anti-termite and anti-insect treatments, and providing paint that is resistant to the effects of bad weather and temperature, as well as waterproof.



Figure 10. (a) Mosque Next to the Gate, (b) Mosque Inside The Forest

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3.3. Road Map

Efforts to improve comfort and provide for community needs require easy access to and infrastructure that has been provided by urban forests to facilitate increased visits and support the improvement of the quality of urban forests as green open spaces that influence ecosystem balance so that a clear route description is needed according to current field conditions through a map description to the location of several facilities available in this urban forest which also helps work and helps improve the performance of forest managers and to facilitate the achievement of Sustainable Development Goals point 8 for decent work and economic growth, and point 9 related to industry, innovation, and infrastructure, and point 11 which includes sustainable cities and communities as described in figure 11.

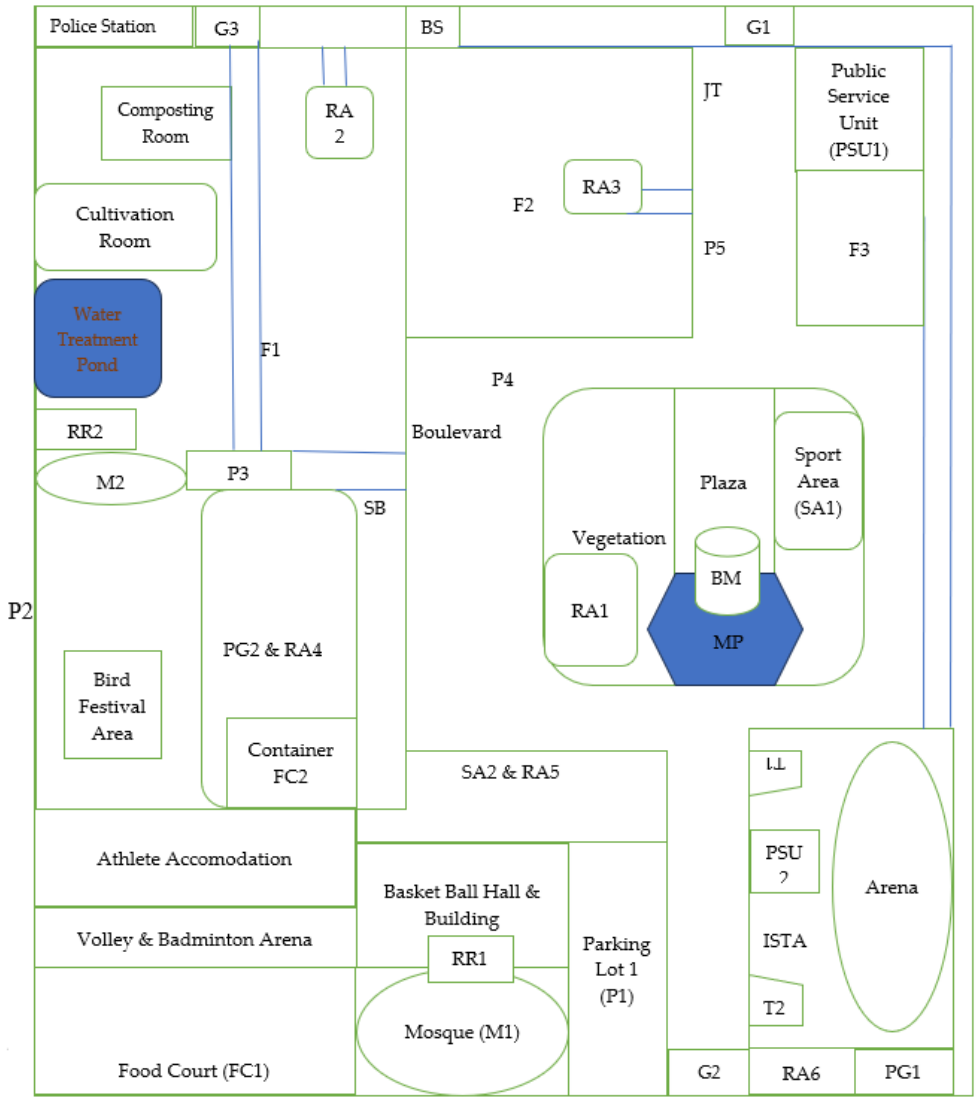


Figure 11. Design Road Map Bekasi Urban Forest In 2026

This plan depicts the land use and location of several facilities available in this forest which affect various types of activities. There are noted, consist of : BM : Bamboo Monument; BS : Bus Stop; F : Forest; FC : Food Court; G : Gate; ISTA : International Skate Track Arena; M : Mosque; MP : Monument Pool; P : Parking Lot; RA : Rest Area; RR : Rest Room; PG : Play Ground; TIU : Technical Implementation Unit; SB : Suspension Bridge; T : Tribune, JT : Jogging Track; - (Blue Line) : Lane.

3.4. Length & Quality of Available Facilities

Increased public visits influence the increase in the quantity and quality of available facilities and infrastructure over time. Therefore, data collection and evaluation of facilities and infrastructure are needed to help monitor the management fund assets provided by the government and the community and serve as indicators in supporting the creation of more conducive, healthy, and high-quality green open spaces. This is outlined in Table 3, as follows:

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Table 3. Facilities of Bekasi City Forest

No	Available Facilities	Qty	Width (m^2)	Conditions & Suggestions
1	Public service unit	2	105	Water resistant for office work tools
2	Police station	1	124	Cctv upgrades and surveillance room
3	Sport areas	5		Basket, Skate, Badminton, Volley, Athletic
4	Bus Stop	1	20	Provision road sign and solar panel
5	Cafetaria area	1	8700	Renovation of building facilities and services
6	Monumental pond	1	60	Repair water & waste channels
7	Gate	4		Provide with green infrastructure by vertical garden
8	Rest rooms	11		Increase and repair sanitation & hygene facilities
9	Parking lots	5	750	Improved quality of parking space and security equipment
10	Playground	2		Some major sports equipments require regular monitoring.
11	Worship building	2	200	Priority repairs to the roof & electrical installation
12	Cultivation room	1	29	Improve lighting & water sprinkler system
13	Composting room	1	40.5	Create waste sorting system and organic wheels
14	Rest area	6		Addition of ccttv, lighting, trash bin and roofing
15	Roller blade hall	1	4030	Roofing & lightning construction
16	Basket ball hall	1	2465	In the process of renovation to upgrade quality
17	Historical monument	3		Use of water & weather resistant paint
18	Pedestrian path		1100	Use of biopores, not slippery.
19	Separator, Trotoar area			2 & 3,5 meter wide around the outside of the forest
20	Scout couching room	1		Construction & installation repairs for cleanliness, roofing, lighting, and sanitation.
21	Bird exhibition hall	1		Use of a dismantling stage & coordination all member with
22	Separator road	1		Routin checking around the outside of the forest
23	Suspension bridge	1		Routine repairs to wood & construction ropes
24	Water Treatment Pond	1		Make a waste water drain to subtitue the clean water
25	Street lights	42		Addition of solar panel lights
26	Information boards	2		Quantity & function of available vegetation should be updated over time
27	Athlete Dormitory	1	3920	Supply electrical installation, internet service, hygiene, sanitation, security & safety
28	Rubbish bin	36		Increase provision quantity & quality of drainage channels
29	Garden lamps	114		Repair of electrical instalations & solar panel lights
30	Vehicles	4		Dum truck, pick up & garbage truck engine repair
31	Park bench	85		Provide a roof and surrounding trash bins
32	Joglo pavilions	2	80	Need to provide lighting & trash bin in the surrounding
33	Traffic Signs	5		Directional signs, overhead signs and road markings for available facilities.
34	Square/Plaza	1		Biopore roads to anticipate mud and flooding
35	Container Boxes	25	150	The sales location should face the visitors
36	Tribune	2		Create roofing construction
37	Public Lavatory	6	20	Enhance cleaning service and equipment
38	Jogging Track	1	500	Provide CCTV, trash cans in the vicinity

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Separator road 2 meters around the outside of the forest bordering Ahmad Yani Street. Tribune located in International Skate Track Area; each tribune can accommodate around 50 spectators. Technical Implementation Unit as a Public Service Unit to handle problem around Bekasi Forest city, the first TIU is responsible to manage the environmental issues in this city forest area under the leadership of environmental service under the supervision of the ministry of environment, and the second TIU is tasked with regulating and resolving related issues International Skate under the land ownership supervision of the management of the Bekasi city youth and sports service. Park bench, garden & street lamps available throughout the interior & exterior, parking lots and jogging track around the outside and inside of the forest. It is safe to use for people with disabilities, the elderly, children, pregnant women, mothers and toddlers

Electrical installation include lighting, internet service, CCTV and sanitation and hygiene such as cleaning service, clean up equipment and toilet, then security and safety consist of security service room for security guard, CCTV, and fire extinguishing facilities such as, fire hydrant, nozzle, box hydrant (fire extinguisher), and water sprinkler system and roof sprinkler system are automated to monitor the entire building and park. Waste sorting is considered an effective means of reducing environmental pollution and encourage promoting recycling (Xia et al., 2021). There are waste sorting machine, crusher and shedder and filter machine to organize waste then organic waste disposed of in organic wells by authorized officer to solve this problem. Which can improve soil fertility and plant growth, safe for use by people with disabilities, the elderly, children, pregnant women, mothers and toddlers.

4. Conclusion

There are several old buildings whose construction is severely damaged, requiring immediate repair or renewal of several components, shapes, and building materials that are not weather-resistant and age-resistant, as well as a lack of care and maintenance that can damage or even endanger the forest ecosystem, so that sustainable building repairs or maintenance are needed. In addition, there are several new buildings that do not consider environmentally friendly construction materials and designs, thus paying less attention to ecological balance. Collaboration with good governance from various stakeholders is needed to carry out more renovations and innovations towards sustainable development in anticipation of the new era. However, if development management is managed with attention to green infrastructure, it can support and accelerate the objectives of the Sustainable Development Goals point 8 for decent work and economic growth, and point 9 related to industry, innovation, and infrastructure, and point 11 which covers sustainable cities and communities.

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