The Existence of Spathodea Park in South Jakarta as a Medium for Education and Climate Change Mitigation

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Abstract:*The existence of Spathodea Park is an open green space that contains various types of plants. This park is located in the Jagakarsa District of South Jakarta City. The purpose of this research is to understand the diversity of plants as a medium for knowledge and education, as well as their role in combating climate change. The research method is descriptive qualitative. Data collection used a purposive sampling approach. The results obtained show the diversity of plants in Spathodea Park, which includes 54 plant species. The presence of these 54 plant species plays a role in the carbon cycle, thus contributing to climate change mitigation. Spathodea South Jakarta as a Medium for Education and Climate Change Mitigation*

Key Words*:* Spathodea park; education; climate change

Introduction

The Spathodea Park in South Jakarta serves as a platform for education and climate change mitigation, in line with the important role of national parks in Indonesia in climate change mitigation. As one of the countries with the largest tropical forests in the world, Indonesia has approximately 125 million hectares of forest, of which 27 million hectares are conservation areas. National parks not only function to preserve species and ecosystems but also serve as a natural solution to climate change issues. Thus, the Spathodea Park can function as a living laboratory for environmental education and research on the impacts of climate change, as well as a place to promote public awareness about the importance of nature conservation (Sagala, 2019).

However, climate change also affects national parks and other conservation areas, including Spathodea Park. Climate change can alter the composition and structure of forests, natural beauty, cultural heritage, biodiversity, and ecosystem services. These impacts can ultimately harm tourism and the development of national parks. Therefore, it is important to conduct research and education in Spathodea Park to understand and address the impacts of climate change, as well as to develop effective mitigation and adaptation measures.

Urban areas currently often face high levels of construction and urbanization activities that result in the reduction of green open spaces (Kohdrata et al., 2018). This can lead to various negative impacts, such as increased temperatures, air pollution, and a decline in biodiversity. Efforts to increase the availability of green open spaces in urban areas are crucial for maintaining ecological balance. One form of green open space that can be developed is urban forests. Urban forests can be a solution to improve the quality of the urban

environment and help reduce the impact of climate change. Urban forests have various benefits, such as maintaining ecosystem balance, absorbing carbon, and providing recreational spaces for the community (Rachmawati, 2017). In addition, urban forests can also be utilized as a means of environmental education for the community. However, many cities in Indonesia have yet to optimize the role of urban forests in maintaining urban environmental quality.

Surabaya, as one of the major cities in Indonesia, still has deficiencies in the provision and improvement of the quality of green open spaces. In the Regional Spatial Planning of Surabaya City, it is mentioned that Surabaya City still lacks in the improvement of the quality of active and passive green open spaces. The efforts made in the provision, management, and improvement of Green Open Spaces are generally directed towards optimizing the function, quality, and distribution of public Green Open Spaces proportionally throughout the city of Surabaya. One type of Green Open Space that requires development efforts is urban forests (Umilia&Aghnia, 2018).

A similar problem also occurs in the city of Jakarta, particularly in the South Jakarta area. Therefore, it is necessary to enhance the participation of stakeholders and all elements of society to increase the area of green open spaces. Community participation is a key element in the planning of green open spaces and maintaining their quality. Spathodea Park in South Jakarta is one example of an urban forest that can serve as a platform to enhance community participation in the management of green open spaces. Spathodea Park can be utilized as an environmental education medium to raise public awareness about the importance of urban forests in maintaining environmental sustainability and climate change mitigation (Sari et al., 2017).

Anthropogenic activities cause a decline in environmental quality. Furthermore, urbanization and development in urban areas lead to a reduction in green open spaces. This situation can increase temperatures, air pollution, and affect biodiversity in the city. Therefore, the presence of urban forests becomes important to maintain ecological balance in urban areas. One of the places that provides benefits is the presence of parks. A park is an area dominated by plant vegetation. Plant vegetation is the type of vegetation commonly found in a park. The purpose of the existence of a park, besides creating beauty in an area, is also to provide green open spaces for the community.

The introduction section must contain (in sequence) a general background, a previous literature study (state-of-the-art) as a basis for the statement of scientific novelty of the article, a statement of scientific novelty of science, and a research problem or hypothesis. At the end of the introduction, the purpose of the article should be clearly written. In the scientific article format, it is not permissible to review the literature as in the research report, but it is manifested in the form of a previous study review (state-of-the-art) to demonstrate the scientific novelty of the article.

Method

The research method used is descriptive qualitative with purposive sampling technique. Data collection was carried out through observation, interviews, and literature study. Data analysis was conducted using data reduction techniques, data presentation, and conclusion drawing.

Results and Discussion

Spathodea Park as an Educational Medium

Spathodea Park is located at Jalan Kebagusan Raya Gang Kriep No.13 RT 13/RW 5, Jagakarsa District, South Jakarta City. The Spathodea Park has a land area of 14,366.00 m². Various types of plants are found in Spathodea Park. In terms of land contour, this park has a terraced soil structure, which is why it is also known as a sloped park. It features spathodea trees, which are its hallmark, as well as other ornamental plants like corpse flowers and shade trees. In the middle of the park, there are also a monument, swings, and a fish pond. The existence of this park is expected to improve the quality of the surrounding environment by providing green open spaces and recreational areas for the local residents. In general, green open spaces in Jagakarsa District are still considered limited. Data shows that most of the open spaces in Jagakarsa are still built-up areas such as sports fields and public cemeteries, while the number of city parks is still limited(Rachmawati, 2017). The development of city parks such as Spathodea Park is expected to serve as an exemplary model for the development of green open spaces (RTH) and to provide a solution for increasing the availability of RTH in the Jagakarsa area.

In addition to being a recreational area, Spathodea Park is also utilized as a learning and educational facility for the community. Visitors can learn about different types of plants, the role of vegetation in the environment, and understand the concept of urban forests. This park provides facilities that support environmental education, such as information boards about flora and fauna, educational areas, and reflection paths. Children, students, and the general public often utilize this park for environmental education activities. Programs such as botanical tours, workshops, and open discussions in this park raise public awareness of environmental issues.

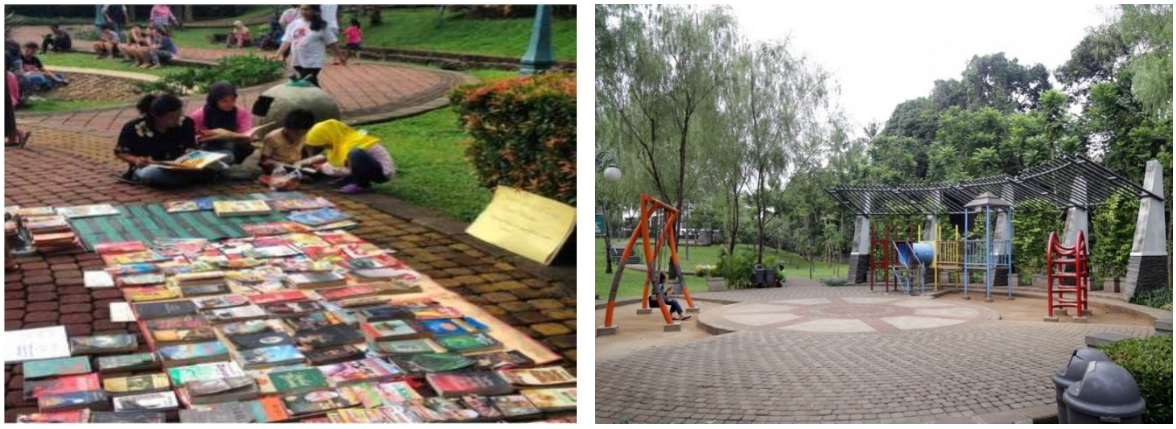

Figure 1. Spathodea Park (Source: google)

Spathodea Park can be used as an effective educational tool to introduce biodiversity to the public, especially the younger generation. In this park, visitors can learn about various types of flora, including the Spathodea campanulata tree, known as the African fire tree, while

understanding the importance of protecting the environment. In addition, this park can also be an interactive outdoor learning space, where students can directly observe the plant ecosystem, understand the life cycle of plants, and learn about sustainable environmental management. By utilizing this garden, learning is not only theory-based but also involves direct practice that can enhance ecological awareness. As explained by (Nababan, 2009) natural environments can serve as effective learning media to instill conservation values in the younger generation.

Climate Change Mitigation

Climate change mitigation is an important step to reduce the negative impacts caused by the increase in global temperatures. These efforts involve various strategies, such as reducing greenhouse gas emissions, using renewable energy, improving energy efficiency, and forest conservation. One of the main approaches is the transition to a low-carbon economy, which involves the participation of the government, the private sector, and society in adopting environmentally friendly technologies. According to (Suhariyanto, 2018), climate change mitigation requires global collaboration and collective awareness to sustain life on Earth through concrete actions and supportive policies.

In addition to its educational function, the presence of the Spathodea Park also has the potential to provide benefits in combating climate change. The vegetation in the park can absorb carbon dioxide, produce oxygen, and regulate the microclimate around it. The Spathodea Park can serve as a model for enhancing green open spaces in the Jagakarsa District. The development and maintenance of this park require continuous efforts to ensure the optimal function, quality, and distribution of green open spaces. The Spathodea Park, with its dense green vegetation, functions as the lungs of the city. Large trees, including the Spathodea tree, play an important role in absorbing carbon dioxide and producing oxygen. Efforts to care for and maintain the Spathodea Garden sustainably are crucial to preserving the quality and function of the garden. In addition to reducing air pollution, the presence of this park helps lower local temperatures (the "urban heat island" effect), which is one of the impacts of climate change.

Based on the Minister of Home Affairs Regulation Number 1 of 2007, Chapter 1, Article 1, Paragraph 2, which states that urban green open space is part of the open space in an urban area filled with plants and vegetation to support ecological, social, cultural, economic, and aesthetic benefits.

It was then explained that the purpose of organizing green open spaces is a) to maintain land availability as a water absorption area; b) to create urban planning aspects through the balance between natural and built environments that are beneficial for the community; c) to enhance the harmony of the urban environment as a means of ensuring a safe, comfortable, fresh, beautiful, and clean urban environment. The existence of green open spaces provides both direct and indirect benefits. Direct benefits (in the sense of being quick and tangible) include creating beauty and comfort (shady, fresh, cool) and obtaining materials for sale (wood, leaves, flowers, fruits). Indirect benefits (long-term and intangible) include being a very effective air purifier, maintaining the continuity of groundwater supplies, and preserving environmental functions along with all the flora and fauna present.

Climate change is the most serious challenge because it can lead to an increase in respiratory diseases and meningitis caused by a lack of O_2 (Triana, 2008). The plants in Spathodea Park can be utilized for ecosystem sustainability, for example, the plants participate in the carbon cycle by absorbing carbon dioxide from the atmosphere through the process of photosynthesis, helping to reduce greenhouse gas effects, and maintaining the Earth's temperature stability. Therefore, the area in Spathodea Park has a pristine atmosphere. In addition, the plants in Spathodea Park provide benefits for animal habitats such as butterflies, worms, and other ground-dwelling animals. The utilization of plants in ecosystem sustainability is that trees provide habitats for various animals, such as birds, insects, and small mammals. This contributes to biodiversity and supports the food web, absorbs toxins (pollutants) and CO_2 in the air, and produces oxygen, making the air fresher. Mariah et al. (2023)saying that plants have six functional values, namely the function of family food security, living pharmacy, economic function, ecological function, conservation function, and aesthetic function. Plants also have good potential for greenhouse gas mitigation or reducing CO_2 concentration from the atmosphere (Hidayati et al., 2013).

Plant Diversity in the Spathodea Garden

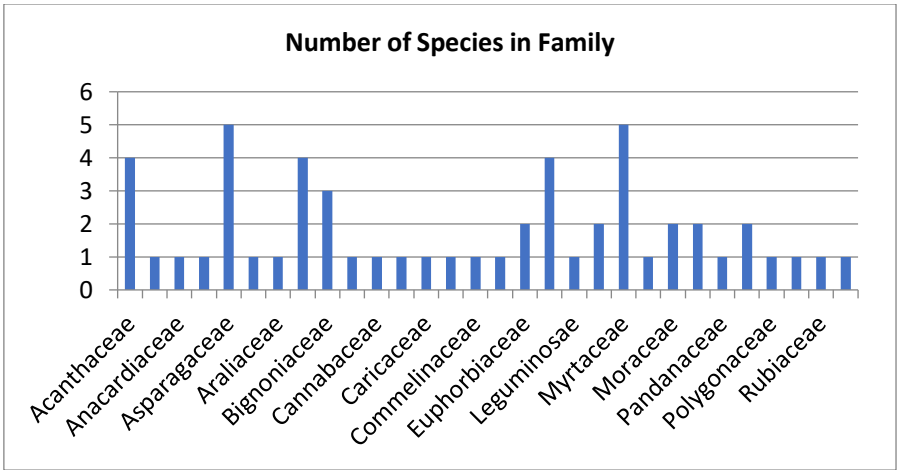

Figure 2. Number of species in family

Based on Figure 2, it is known that the highest number of species in one family is 5 species. The families are the Asparagaceae Family and the Myrtaceae Family. The next highest number of species in one family is 4 species, which are the Acanthaceae Family, the Arecaceae Family, and the Fabaceae Family. The total number of species from all families is 54 species.

The Asparagaceae family is a family with species members that have economic value. One of the important members of the Asparagaceae family is *Spathiphyllum*. Spathodea is a plant commonly found in urban gardens in Indonesia as an ornamental plant. *Spathodeacampanulata*, commonly known as Spathodea, is a type of tree from the Bignoniaceae family that is characteristic of Spathodea Park. (Silalahi, 2019)saying that the economic value of the Asparagaceae Family is derived because its species are ornamental

plants. Spathodea Garden, species from the Asparagaceae Family include *Dracaena fragrans*, *Velthelmiabracteata*, *Cordyline fruticosa*, *Dracaena angustifolia*, *Agave vivipara* L.

The Myrtaceae family is known as the guava family. This family has many members that are widely utilized by humans. (Tjitrosoepomo, 1994) states that many of its members are producers of essential oils with medicinal properties, and many are also fruit trees. Members of the Myrtaceae family in the Spathodea Garden are *Syzygiummyrtifolium*, *Eucalyptus deglupta*, *Melaleuca cajuputi*, Syzygiumcumini, *Syzygiumjambos*. In general, the plants in the Spathodea Garden can provide benefits beyond shade and environmental aesthetics; they can also offer economic advantages from the products they yield, such as fruits, leaves, or essential oils (Arief et al., 2017). The spathodea tree itself has aesthetic value with its beautiful orange flowers, as well as other potential uses.

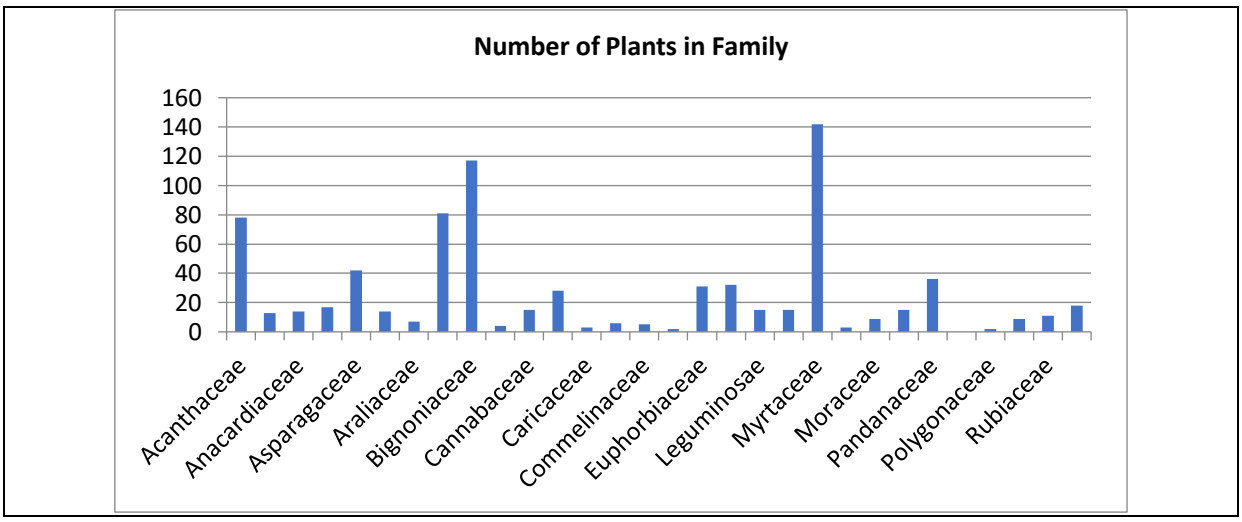

Figure 3. Number of plants in family

Based on Figure 3, it is known that the family with the most standing plants is the Myrtaceae family with 142 plants. Then the Bignoniaceae family with 117 plants. The families with the lowest number of plants are the Costaceae family and the Polygonaceae family with 2 plants each. The total number of standing plants from all families is 784 plants. The large number of plants from the Myrtaceae family indicates that this family can adapt well. (Lutfiasari&Dharmono, 2018) saying that the good adaptation of the Myrtaceae family is possible because of its root system, namely the taproot equipped with many root hairs. The species with the highest number of plants in this family is *Syzygiummyrtifolium* with a total of 95 plants. The Bignoniaceae family is a family with beautiful flowering characteristics. (Simpson, 2019) saying that this family consists of woody, flowering, and fruiting plants. The species *Spathodea campanulata* has the highest number, with 103 plants and this dominance likely led to it being named Spathodea Park.

Social and Environmental Impact

Spathodea Park creates a healthy space for social interaction amidst the city's density, strengthening community bonds through shared activities. Additionally, the presence of this park also enhances the aesthetic value of the surrounding area. Public spaces in urban areas play an important role in fostering social cohesion within the community (Christy et al., n.d.;

Pramesti et al., 2019). Research shows that the availability of green open spaces in the Spathodea Park area, South Jakarta, has created an environment conducive to social interactions among residents. This park provides a place for residents to gather, socialize, and engage in activities together, such as exercising, playing, or simply relaxing (Agustianti&Pudianti, 2022).

The presence of Spathodea Park has helped reduce the strain in interpersonal relationships amidst the increasing density of the city. Green open spaces like city parks can serve as places to re-establish social bonds within the community. In addition, the presence of city parks also provides other benefits such as comfort, beauty, and well-being for the residents. Thus, Spathodea Park is not just an open green space, but can also become a center for community activities and interactions, while simultaneously improving the quality of the surrounding environment. With proper maintenance and development, Spathodea Park has the potential to become a model for other city parks in the Jagakarsa District, in an effort to improve green open spaces and the quality of the urban environment. As one of the green open spaces, this park helps maintain the balance of the local ecosystem, improves the quality of life for residents, and inspires the development of similar parks.

Conclusion

Spathodea Park in South Jakarta plays an important role as a green open space that not only serves as a recreational area but also as an educational tool and a means to mitigate the impacts of climate change. Through supporting facilities such as environmental education areas, information boards, and community-involving programs, this park has become a learning hub for the public about the importance of nature conservation and environmental sustainability. The existence of this park also makes a significant contribution to climate change mitigation. With its dense and diverse vegetation, the park serves as a carbon dioxide absorber and oxygen producer, helping to lower environmental temperatures and reduce the impacts of urbanization. The existing water absorption system is also effective in addressing flood issues and maintaining groundwater availability in urban areas. Spathodea Park has a diversity of species with 54 plant species. The total number of plants is 784. The Spathodea Park plays a role in education and learning. The existence of the Spathodea Park can maintain the presence of factors that influence the climate, such as water and air. However, the sustainability of this park's functions requires special attention, including better management and increased public awareness to maintain cleanliness and the integrity of the park's ecosystem. With sustained support from the government, community, and the wider public, Spathodea Park can continue to be a model of an educational and environmental park that can provide positive impacts, both locally and as an inspiration for the development of other green spaces in major cities.

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