SURABAYA'S STRATEGY TOWARDS GREEN CITY

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Abstract

Surabaya, as the second largest city in Indonesia with a population of 3,095,026 in 2019, faces significant challenges related to population growth, which has resulted in an increased demand for land for infrastructure development and supporting facilities. While this demand is important to meet the needs of citizens, it also creates new problems such as environmental pollution in the form of water, air, and soil, as well as disaster risks such as floods and droughts. One of the environmental impacts felt is the increasingly noticeable temperature change. Therefore, to respond to these challenges, the Surabaya City Government is taking steps towards the Green City concept. The main goal is to realize a sustainable and environmentally friendly city. The main focus of this article is to analyze Surabaya City's efforts in implementing the Green City concept by focusing on the provision of Green Open Space (RTH). The research method used is a literature study using secondary data from various sources such as books, theses, journal articles, papers, and related electronic sources. The results showed that the Surabaya City Government has tried to fulfill three initial attributes towards Green City, namely sustainability-based planning and design, development of extensive Green Open Space, and encouraging the development of green communities and buildings. These efforts show concrete steps in responding to environmental challenges and realizing an environmentally sound city in the midst of rapid urban growth.

Keywords: *Strategy, Green City, Surabaya, Environment*

INTRODUCTION

Currently in Indonesia, especially in several cities, continues to experience development that can be said to be rapid, this development is because urban areas are areas with dense populations and as centers of human activity which then results in areas in urban areas being dominated by land with buildings. The development of cities can also be caused by population dynamics, economic and social changes and interactions that occur with other regions or cities. With a large population, it also has an impact on the increasing need for land for infrastructure development to facilitate the needs of the city's residents, where the development often shifts and takes over the existing land or green open space to be converted into built-up land, so that green open space in the city is decreasing. The impact of various economic and social activities, among others, is the high demand for the use of built-up land so that natural open space in the city is reduced. This trend of urban development does not only occur in the city

center but also extends to suburban areas and surrounding areas, where along with the increase in population, the need for development of city facilities and infrastructure to serve the needs of city residents also increases (Fuady, 2021).

The issue of global warming is an issue that has received international attention. Many problems regarding global warming have emerged in various parts of the world, so the international world is required to solve these problems. Global warming that occurs is characterized by climate change in various countries, such as reduced rainfall or prolonged drought. There are several causes of global warming, one of which is due to the reduction of green land because many are converted into urban buildings. The issue of global warming is certainly an important issue because global warming can threaten the sustainability of the environment and humans, so in this case many are taking concrete steps to overcome the issue of global warming (Ummah et al., 2022). Half of the earth's population (3.5 billion people) currently live in cities. It is estimated that by 2055, 75% of the population will live in urban areas. Urban areas actually cover only 2% of the Earth's area, but are responsible for more than 70% of both energy consumption and carbon emissions (Green et al., 2020). As for the Asian continent, Southeast Asia is one of the least urbanized regions. Despite this, its population growth is 1.75 times faster than the global urban population growth rate (Caesarina & Rahmani, 2019).

Instruction of the Minister of Home Affairs No. 14 of 1988 Concerning: Green Open Space Arrangement in Urban Areas Considering; That with the increase in development in various fields, especially development in urban areas, which has resulted in an increase in the welfare of urban communities, it still has a negative impact on the environment and aspects of urban planning, in the form of reduced green open space that functions to maintain the balance of urban ecosystems (Kolondam et al., 2022). Sustainable urban development is one of the development concepts that can be applied to overcome various urban issues (Rista & Siregar, 2019). A sustainable city is a city that has functions and roles whose implementation is guided by the principles of sustainable development or sustainable development goals (Primastuti & Puspitasari, 2022). Surabaya City is one of the largest cities in Indonesia, located in East Java. Surabaya is a large industrial city with many environmental problems that have emerged (Fathinnah et al., 2022). As an industrial city, of course, there are many

construction of buildings, many factories, city housing and so on which cause environmental problems such as environmental pollution, air pollution, polluted rivers to problems regarding waste (Trifita & Amaliyah, 2020). In today's modern era, the concept of urban development is not only oriented towards economic value. However, it must also be environmentally friendly or commonly known as green city (Selili & Samarinda, 2020).

In this challenging modern era, sustainability has become a keyword in urban planning. Efforts to reduce negative environmental impacts and ensure a better quality of life for urban residents are prioritized. One of the approaches taken is the concept of "Green City". Surabaya City, as one of the major cities in Indonesia, has stepped forward in applying Green City indicators in development planning and implementation. The temperature change caused by the large amount of built-up land due to the increasing population has prompted the Surabaya City Government to take action. This action is an effort to realize Surabaya City as a Green City, one of which is through the provision of green open space (RTH). As quoted through republika.co.id Surabaya City is preparing itself to become a Green City in 2020, and what is currently being intensively carried out is related to the availability and addition of green open space or RTH.

LITERATURE REVIEW

Green City Concept

Green City is a planning concept that pays attention to the environment and principles of sustainable development. Sustainable city development is a city with planning that focuses on improving the quality of the environment, saving energy, developing human resources, and having a good economic impact (Noer et al., 2021). The concept of Green City in Indonesia according to the Ministry of PUPR is defined as a city that is built by not sacrificing the assets owned by the city, but constantly cultivating all other assets owned such as humans, the environment, and also built infrastructure facilities (Widodo, 2021). Sustainable development means a development process, be it land, community, city, or business development, which has the principle of meeting current needs without sacrificing the fulfillment of future needs. The Green City concept is a city development concept that considers ecological aspects in it for the welfare of development. The Green City concept here is present and offered to handle

regional development that will not go hand in hand with ecological aspects in an area which has several variables that are considered in the formulation of the concept, namely Land Use and Green Buildings, Transportation, Waste, Water Availability, Sanitation to Environmental Regulations (Kibas et al., 2023).

Government Policies and Initiatives

The Green City concept is contained in a program, namely the Green City Development Program (P2KH). Quoted from pu.go.id, P2KH is an initiative and a form of responsibility from the Central Government in this case the Ministry of PUPR together with the Regency / City Government to realize the formation of a higher quality and environmentally friendly urban space through good planning. To realize Green City requires serious cooperation and synergy among stakeholders. Not only cooperation, but also good intentions, seriousness, hard work, and of course good and mature planning supported by legislation, which must be implemented consistently and responsibly (Nuralam, 2018).

Green City Principles

The Green City Development Program (P2KH) is a form of elaboration of the Spatial Planning Law (UUPR) Number 26 of 2007 and as a form of follow-up to the 10 Bali Initiatives from the Sustainable Urban development (SUD) forum specifically at point 7, namely "encouraging the role of stakeholders in realizing Green City", which is realized through joint initiatives between the Central Government, Regency / City Governments, communities and businesses nationally (Noer et al., 2021). In addition, in the implementation of the Green City development program (P2KH), there are also principles that must be implemented (Young & Kosasih, 2019), which are as follows:

1. Facilitation on the strengthening of three main indicators (attributes) namely the design and planning of environmentally friendly cities, the availability of green spaces, and the existence of green communities from the community.
2. There is an expansion of Green City by developing three further indicators (attributes) namely green building, green energy, and also green waste.
3. Performance-based for roll-over of stimulant funds.
4. Local-led development in order to empower and increase local capacity and build ownership of the process as well as the product.

5. Optimized project-cycle is a short, action-oriented cycle of planning, programming, development, maintenance and evaluation.
6. Urban labs are a shared learning medium that can be taught and applied widely.

Green City Attributes

According to the Ministry of Public Works and Public Housing, achieving the Green City vision requires the implementation of 8 attributes or indicators that must be carried out in an integrated manner. The PUPR Ministry explains the details of the Green City attributes as follows (Utomo et al., 2023) :

1. Green Planning and Design, which is the planning of a city and its design that adapts to the biophysical conditions of the city area.
2. Green Open Space, which is done by realizing the development of green open space
3. Green Waste, the implementation of reduce, reuse, recycle
4. Green Transportation, sustainable and mass transportation
5. Green Water, efficient utilization of water resources
6. Green Energy, utilization of environmentally friendly and efficient energy sources
7. Green Building, application of energy efficient building concept
8. Green Community, the active role of the community as an effort to develop a green city

RESEARCH METHODS

The method used in this research is a descriptive method using a qualitative approach. This method focuses on an in-depth understanding of complex issues and can involve synthesis, analysis, and interpretation of various existing literature sources. Literature study or literature review means theoretical studies, references and other scientific literature that have a connection with the culture, values and norms that develop in the social situation under study. The type of data used is secondary data sourced from books, theses, journal articles, papers and electronic sources. Then the research results are concluded in accordance with the data obtained. Primary data in this study comes from previous studies related to the analysis of Surabaya's strategy in achieving Green City.

RESULTS AND DISCUSSION

Implementation of Green City Key Indicators

Surabaya City is the second city in Indonesia with the largest population, with a total population in 2019 of 3,095,026 people. With so many people, of course, it increases the demand and use of land to build facilities to support and fulfill their needs, which will then result in new problems such as environmental pollution (water, air, soil pollution etc.) and disasters such as floods and droughts. The most visible environmental problem is temperature change. So, to reduce and overcome these problems, the Surabaya City Government is trying to implement the concept of Green City, where in the Green City there are eight indicators or attributes that must be met (Rosianty et al., 2020).

Tabel 1. Surabaya's achievements in the three main indicators of Green City

Green City Key Indicators	Achievements
Green Planning and Design	Surabaya City already has green planning and design which is contained in Regional Regulation Number 12 of 2014 concerning the Surabaya City Spatial Plan (RTRW) 2014-2034 (Kusuma et al., 2020).
Green Open Space	Until the end of 2022 the area of public green open space (RTH) in Surabaya City has reached 22% or equivalent to 7,358.87 ha of the total area of Surabaya City. This data shows that Surabaya City has exceeded the requirements or regulations set by the government, namely the fulfillment of public green spaces of at least 20% of the total area. (surabaya.go.id)
Green Comunity	Green communities or environmental care communities in Surabaya city, including those that are still actively conducting programs and activities are HiLo Green Community Surabaya, Earth Hour Surabaya, and Sea Soldier Surabaya (Kusuma et al., 2020).

Source: Processed by the author, 2023

Strategies Implemented in Surabaya Towards a Green City

Green Planning and Design

In the city of Surabaya, plans to design and develop urban areas with an environmentally friendly concept are recorded in Regional Regulation Number 12 of 2014 concerning the Regional Spatial Plan (RTRW) of Surabaya City for the period 2014-2034. The RTRW also mentions how Surabaya City seeks to develop its city into an international trade and service city with local character that is smart, humane, and ecologically based (Kusuma et al., 2020).

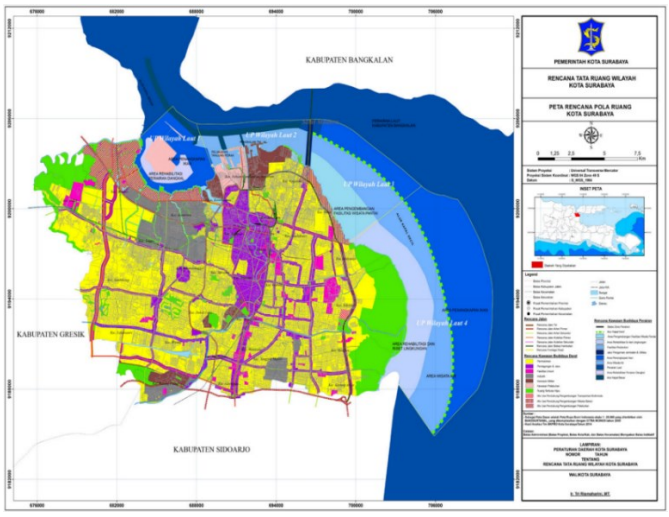

Figure 1. Map of Surabaya Regional Spatial Plan

(Source: Analysis Result of BKPRD Team Surabaya City)

Referring to Perda No. 12 of 2014 concerning the Regional Spatial Plan (RTRW) of Surabaya City 2014-2034, the spatial pattern plan is divided into protected and cultivated areas. The percentage of existing protected area is ± 40.13% and cultivated area is ± 59.87%. Protected areas consist of areas that provide protection to subordinate areas, local protection areas, green open spaces, natural preservation areas and cultural heritage, disaster-prone areas, and marine protected areas. While the cultivation area is divided into public facilities, trade and service areas, settlements, industrial and warehousing areas, military areas, port development areas, areas supporting the development of marine tourism, and mixed use areas of settlements and public facilities (Surabaya, 2016).

Green Open Space

Currently, the green space area in Surabaya has reached 21.99 percent of the total city area, which is around 7,290.53 hectares. According to research (Aminah, 2022) obtained through secondary data processing from the Parks Service, which is around 7,290.53 hectares. In total, Surabaya already has at least 142 active parks and 311 passive parks. What is meant by active parks themselves are parks that can be visited by many people, while passive parks are parks that are located on road islands and cannot be visited by the public. As for the number of green spaces, the achievement of the Air Quality Index (IKU) of Surabaya City is at 90.31, which means it exceeds the achievement of the national IKU. It is estimated that the existing green spaces in

Surabaya can absorb CO2 of 642,794.59 tons / year. In addition to supporting the achievement of SDGs, the existence of massive green spaces in Surabaya is also a realization of the Ministerial Regulation (Permen) of Public Works Number 05/PRT/M/2008 which mandates that the proportion of green spaces in urban areas is at least 30 percent, consisting of 20 percent public green spaces and 10 percent private green spaces.

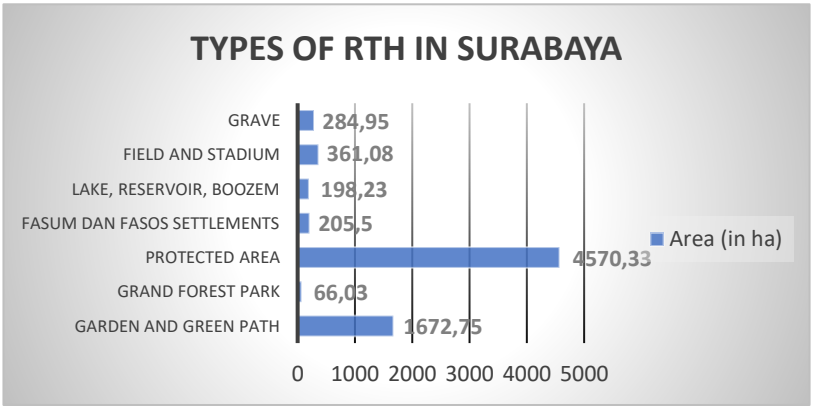

Figure 2. Percentage of green space types in Surabaya
(Source: Secondary Data Processing of the Park Service)

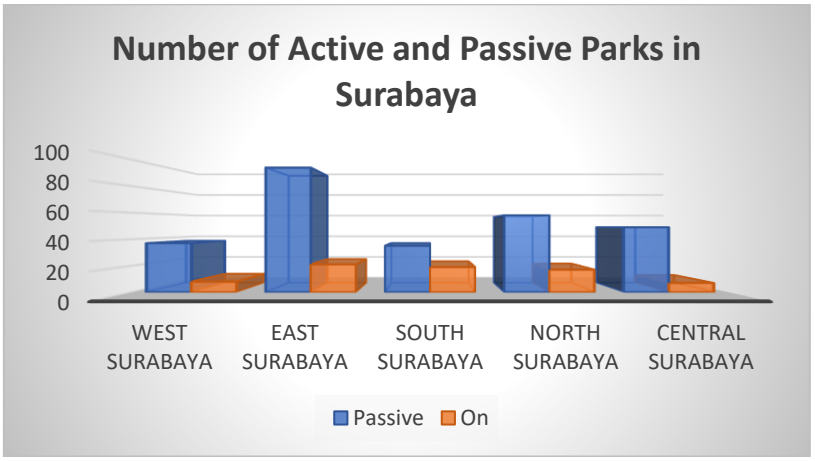

Figure 3. Number of Active-Passive Parks in Surabaya
(Source: Secondary Data Processing of the Park Service)

Green Community

One approach in applying the principles in the Green Community Indicator is through the implementation of programs that are directly implemented in Surabaya City. Some of them include:

Table 2. Green Community in Surabaya

Green Community	Details	Program
HiLo Green Community Surabaya	a community of young people who care about environmental issues and effectively implement green action programs that contribute to raising public awareness of environmental concerns (Kusuma et al., 2020).	Educational Programs (Reusable Bag Campaign, Tumbler Day, EduGreen Goes to School)
		Program Collaboration (Ngabuburit Hijau, Community Gathering, Community Shortival)
		Center Projects (Mangrove Konco, Assisted Orphanage)
Earth Hour Surabaya	Earth Hour Surabaya was officially established in 2011. The establishment of Earth Hour Surabaya started from the *roadshow of* Earth Hour Indonesia and WWF-Indonesia Foundation to several cities and one of them is Surabaya. Earth Hour is a campaign to express our concern for climate change by turning off lights and electronic equipment that are not being used for 1 hour (20.30 - 21.30 local time) on every Saturday in the last week of March every year (ehsurabaya.com).	The switch off action, which takes place every third week of March, invites the public to turn off the lights for 60 minutes to save energy.
		Earth Hour Goes to School, a socialization and visit to elementary schools to encourage children to utilize plastic waste.
		Mangrove Green Concert (Mager), an activity to plant mangroves by the sea in collaboration with the Surabaya City Parks Department and collaborating with other communities, students and the media.
Sea Soldier Surabaya	This community was established in 2016 as a reaction to concerns about the amount of plastic waste scattered around and the lack of awareness of Surabaya people towards environmental cleanliness (Kusuma et al., 2020).	Beach Clean Up Day, education to educational institutions and communities, environmentally friendly activities.

Source: Processed by the author, 2023

Green Building

Basically, the concept of Green Building is a concept that requires every building not to have a bad impact on the environment and have an insight into sustainable development(Kevin Aqsya Fuad et al., 2022).

Tabel 3. Green Building di Surabaya

Joyoboyo Intermodal Terminal	Description
 Source: Kompas.com  Source:suarasurabaya.net	**Green Facade** The terminal land is equipped with sufficient green open areas with landscaped areas free from building structures. While the terminal facade, conceptualized with *green facade* by creating vertical plants to improve the quality of microclimate. **Energy Saving** Energy efficiency and conservation is also achieved with the inclusion of sufficient natural light. This is aided by the use of energy-efficient lighting and energy-saving features in elevators and escalators. **Water Recycling** The construction of the Parking Building and TIJ also pays attention to water conservation. Namely, by recycling used water (*gray water*) to be reused for watering plants and *flushing toilets*.
Spazio Office	**Description**
 Source: spazio.co.id	Spazio is an office building, located at Jalan Mayjend Yono Soewoyo Kav. 3, Graha Famili Surabaya, Indonesia. **Site Landscaping** The total land area of the Spazio Building is 8087 m2, the softscape area in the site is 1154 m2 consisting of a garden, vertical garden, wall garden at the back of the building and roof garden on the second floor. The hardscape area in the site is 2381.3 m2 in the form of vehicle circulation around the building in the site, outdoor parking, and inner courtyard. So that the landscape area is 40% of the total land area, which is 3535.3 m2. For landscaping Spazio Building uses local plants. **Visual Comfort** The results of measuring the lighting level in the Spazio Building, are in accordance with the average lighting level, renderance, and color temperature recommended based on SNI. **Waste Management Practice** Spazio management has standard operating procedures, training and reports to collect and segregate waste based on organic and inorganic types. (Tasya & Putranto, 2019)

CONCLUSION

Surabaya as a city with a large population and rapid growth faces various environmental challenges including air, water and soil pollution, as well as disaster risks such as floods and droughts. In an effort to address these issues, the Surabaya City Government has taken strategic steps towards the Green City concept as a sustainable

solution. Several Green City indicators have been fulfilled, especially the main indicator of Green City, Surabaya City already has green planning and design which is contained in Regional Regulation Number 12 of 2014 concerning the Regional Spatial Plan (RTRW) of Surabaya City 2014-2034. Until the end of 2022 the area of public green open space (RTH) in Surabaya City has reached 22% or equivalent to 7,358.87 ha of the total area of Surabaya City. This data shows that Surabaya City has exceeded the provisions or regulations set by the government, namely the fulfillment of public green spaces of at least 20% of the total area. green communities or environmental care communities in the city of Surabaya, including those that are still actively carrying out programs and activities, namely HiLo Green Community Surabaya, Earth Hour Surabaya, and Sea Soldier Surabaya. As well as Green Buildings, Joyoboyo Intermodal Terminal and Spazio Office, these two buildings are concrete evidence of Surabaya's commitment to implementing green building strategies. Joyoboyo Intermodal Terminal has been transformed into an environmentally friendly transportation hub with the utilization of renewable energy and efficient waste management. Meanwhile, Spazio Office highlights sustainable design and energy efficiency in a modern office environment. Surabaya City Government has successfully implemented its strategy towards Green City with substantial and accomplished achievements, reflecting its deep commitment to environmental sustainability.

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