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The Analysis of Green Open Space Policy in South Jakarta, Indonesia

Rafa Nismara Dahayu and Erda Rindrasih

Faculty of Social and Political Sciences Universitas Gadjah Mada

Green open space (GOS) refers to the areas of vegetation within urban environments, possessing a variety of functions beneficial for the environment, social, and economic aspects, necessary to coexist within urban realms. However, to establish the ideal GOS many challenges has been faced by some cities. Limtied attention has been given to the policy implementation of GOS, particularly in the mega city, such as Jakarta. Thus, the study of GOS policy is important to be conducted. This research aims to identify the status and challenges of the implementation of green open spaces in Jakarta, Indonesia. The study found that the current policies surrounding green open space in Jakarta and the provisions of parks in South Jakarta have not fulfil the ideals set by the mandated laws; this inability also highlights the challenges of the system management and devaluation of its existence due to the decreasing prioritization of government directives. Furthermore, this study underscores the progressions and attempts to improve the provisions of green open spaces, despite being incremental.

Keywords: Green Open Space, Policy, Public Parks, Jakarta, South Jakarta

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Corresponding Author
Erda Rindrasih
Department of Public Policy and Management
Faculty of Social and Political Sciences
Jl. Sosio Yusticia, Bulaksumur, Yogyakarta 55281
E-mail: erda.rindrasih@ugm.ac.id

INTRODUCTION

The rapid development has attracted more people to live in the city, which cause urbanization. It is predicted that 65% of the world's population will occupy urban areas by the year 2025 (Angel et al., 2011). The urbanization shifts the land use of the town from green to build environment. Furthermore, the shift from rural to urban areas has shaped the proportion of people moving closer to the cities. The urbanization phenomenon further impacts the city landscape and environment. It creates attention to the need to arrange the spatial distribution of urban areas for green and physical infrastructure (Geissdoerfer et al., 2017).

The land use plan for green and built environments may create conflict when it is not managed correctly in the rigorous policy implementation. Green Open Space (GOS) is important in the physical world, producing oxygen, preventing floods, moderating temperatures, including biodiversity, and promoting social cohesion, collaboration, and interaction (Jennings & Bamkole, 2019). Urban GOS plays a vital role in contributing to ecosystem services and mitigating the negative impacts on the quality of life for urban residents. However, rapid urban expansion leads to a significant decline in green spaces. As GOS shrink and become fragmented within urban areas, they suffer from reduced connectivity, biodiversity, and ecosystem function (Tian et al., 2011).

In many countries, the implementing ideal proportion formula of Green Open Space is challenging due to its high pressure from high demography. Based on the United Nations Population Fund projection, Asia, Africa,

and Latin America will proliferate and could attract 90% of the urban population (UNFPA, 2007). Particularly in Southeast Asia, the speed of urbanization was measured at 2.4% per year, which is relatively high compared to other regions (UN DESA, 2012). As one of the fastest-growing countries, Indonesia faces challenges designing and implementing green open spaces. The Minister of Public Works and Public Housing made an effort to enact urban Regulation, namely Regulation 05/PRT/M/2008. This policy defines green open space as an extended and grouped area that is used openly for the growth of plants, both natural and intentionally planted. Furthermore, the law explicitly requires the provision and utilization of green open space, with a minimum requirement of 30% of the city's total area.

Jakarta is one of Indonesia's major urban areas. It is the country's centre for trade, commerce and governmental agencies. Jakarta has attracted a large influx of people from across the nation. However, at the same time, it is facing a significant and potentially dangerous threat of environmental degradation that is affecting the livelihood and wellbeing of its people. Jakarta is facing the challenge of being a sinking city (Erkens et al., 2015), with one of the worst air qualities in the world (Jong, 2023). While there is a legal framework in place for green open spaces, there are still some implementation challenges to be overcome. It is understandable that land values in Jakarta are very profitable for businesses. This makes it challenging to use the land for green open spaces, especially in competition with the needs of the provincial and central governments.

The current laws, regulations, and programs regarding green open spaces (GOS) with specific percentage requirements represent both a commitment to environmental sustainability and a potential barrier to economic growth. This raises questions about how these GOS policies are implemented and the challenges involved. This research focuses on the central question: How are GOS policies implemented in the Province of Jakarta? The aim of the research is to analyse the implementation of GOS from the perspectives of the government, citizens, experts, and communities. The research contributes to the academic debate on whether GOS policies should be revised better to meet the expectations of stakeholders and the ecosystem. The results could also be used as loop to investigate other cities in the world that has similar challenges.

The next section provides the literature basis for green open space and its relation to urban sustainability. It is followed by methods used in this study. Section four explains the data gathered from the interview and observation which is completed with analysis and discussion. Finally, the section five presents the conclusion.

GREEN OPEN SPACE FROM DISCOURSE TO POLICY

Urban Sustainability

Sustainable urban development is crucial for safeguarding the natural environment and the well-being of people and society. Inappropriate urban planning and development practices can have adverse effects on the surrounding environment (Bai et al., 2012). These impacts may include disturbances to rainfall, temperature (Liu & Diamond, 2005; Shao et al., 2006), and the quality of air, water, and soil in the area (González et al., 2005; Zhou et al., 2004). Urban sustainability aims to create and maintain a favorable urban environment in the long term for future generations. This includes conservation of natural resources, social equity, economic viability, and meeting basic human needs (Zeng et al., 2022).

The goal of sustainable urban development is to develop urban areas to increase citizen well-being and encourage innovation to reduce environmental impact while ensuring socio-economic benefits (Bertram et al., 2022). Urban sustainability frameworks often use thematic categories rather than organizing metrics by sustainability elements. However, it is recognized that there is a common challenge in evaluating the institutional dimension less frequently than the environmental and social dimensions, which are more commonly represented (Michalina et al., 2021).

Urban densification is becoming more prevalent as cities develop, and urban sprawl becomes less desirable among communities. It presents an exciting opportunity to rethink land use and create more green open spaces (Arnberger, 2012) to achieve urban sustainability. The presence of the private sector, which includes landowners and developers with financial resources, is a significant factor in the challenges related to densification. It highlights the importance of adopting a cooperative strategy to manage the availability of green open spaces effectively. Nevertheless, the government has a vital role in implementing policies that will help maintain green open spaces. The public interest justifies this role, particularly in light of the growing disparities in land use rights. The issue of land-use rights raises concerns about the formation of exclusive clubs that arise from the increasing preference for densification and the devaluation of green open spaces. It creates a thrilling competition over public resources and increases the likelihood of the private sector profiting from restricted access only available to those with greater purchasing power (Verheij et al., 2023).

Green Open Space as Public Domain

Previous literature on Green Open Space has been focused on the tangible aspect, such as spatial analysis, quality and quantity of amenities and size (Cho et al., 2008; Xue et al., 2017). In the study conducted by Burges et al. (1988), green open space is measured based on distance proximity and sizes, which determine the extent of experience quality and inclusive accessibility. In that study, the GOS, which is closer to one's home and has larger dimensions, serves a better purpose for society. Thus, the dimension of tangible aspect has been dominating the discussion in order to provide green for communities.

The term "green" in green open space implies the potential environmental benefits of its existence. These benefits include improving air quality through filtration, reducing the impact of pollution, minimizing surrounding noise, stabilizing temperatures, absorbing stormwater, and recharging groundwater (Escobedo et al., 2011; Wolch et al., 2014). Urban climate remains a pressing issue in urban environments, attributed to increasing temperatures resulting from elevated air pollution levels (Heidt & Neef, 2008). Green open spaces have been shown to encourage pleasant social interactions and fostering social cohesion (Jennings & Bamkole, 2019). They offer numerous benefits, including reducing exposure to environmental harm, restoring physical and emotional well-being, and promoting physical activity (Markevych et al., 2017). In terms of human health, the presence of green open spaces is linked to enhanced psychological well-being, reduced cardiovascular morbidity and mortality, decreased risk of obesity and diabetes, and improved pregnancy outcomes (Thompson & Silveirinha de Oliveira, 2016). Additionally, increasing the proportion of green open spaces can lead to greater contact with nature, which has been shown to enhance the immune system (Kuo, 2015) and mitigate health issues associated with prolonged stress and cognitive depletion (Douglas et al., 2017).

To complete the physical dimension that has been discussed in many previous literatures, the analysis of the social and political aspect is necessary to be conducted. Cities and countries government are responsible for creating new green open spaces or enhancing existing ones (Bertram et al., 2022). The presence of green open spaces is commonly associated with public areas managed by the government. However, the role of privately-owned green open spaces is also worth discussing due to their location. While there are potential areas that can be transformed into green open spaces, it's important to note that in urban areas, real estate and housing market forces heavily influence the availability of such spaces (Cho, 2008). Additionally, it's fair to say that although green open spaces are generally accessible, the actual distribution of these spaces can vary. Large parks are essential for cities, but only a select few may have the opportunity to live near them (Li et al., 2022). Green open spaces have a significant impact on the quality of life and well-being of residents. In urban environments, these spaces play a crucial social role in meeting the diverse needs of city residents.

It has become increasingly evident that integrating socioeconomic factors into urban planning can improve the

delivery of ecosystem services that benefit people's health and well-being (Wilkerson et al., 2018). The unequal distribution of green open space prompts a diverse approach to creating accessible parks (Wolch et al., 2014). It is essential to consider citizen involvement, as green open space serves an ecological function and a space for community engagement. Communities involved in managing green open spaces play a crucial role in enhancing natural capital within urban areas. Study conducted in Canberra city shows that planning a comprehensive urban green infrastructure in the city is a complex process and requires not only a socio ecological understanding of the different types of urban green space but also possible interventions to make those environments more nature positive (Ignatieva & Mofrad, 2023). Therefore, the relationship between green open space management, design, planning, and community participation can potentially enhance the productivity of ecosystem services (Dennis et al., 2016).

Based on many literatures review that has been conducted, this research build research framework to identify factors influenced by the current proportions and is built on four main guiding aspects: accessibility, proportions, inclusivity, and vulnerability. It then delves into the respective sub-aspects that influence existing policies and status.

Accessibility refers to increasing mobility through integrating green open spaces with transit (Calthorpe, 1993), green open space based on spatial distribution, and park coverage (Wolch et al., 2014). Proportion as an aspect refers to meeting the set targeted percentage (Regulation of the Minister of Public Works and Public Housing No. 5 of 2008), measuring the accumulated proportions of green open space to be developed (Bertram et al., 2022), and proportion increase based on living standards in terms of wellbeing (Wilkerson et al., 2018).

Inclusivity refers to synergic green open space management through services and facilities (Dennis et al., 2016) and accommodating various backgrounds (Macedo & Haddad, 2016). Vulnerability refers to how Jakarta is susceptible to various natural disasters, thus pushing the need for mitigative strategies to be implemented (Budiyono et al., 2014; Saputra et al., 2017). This research analyses these existing policies and current status based on user-based and management-based stakeholders involved in implementing green open space policies. The aim is to draw out recommendations to overcome the challenges.

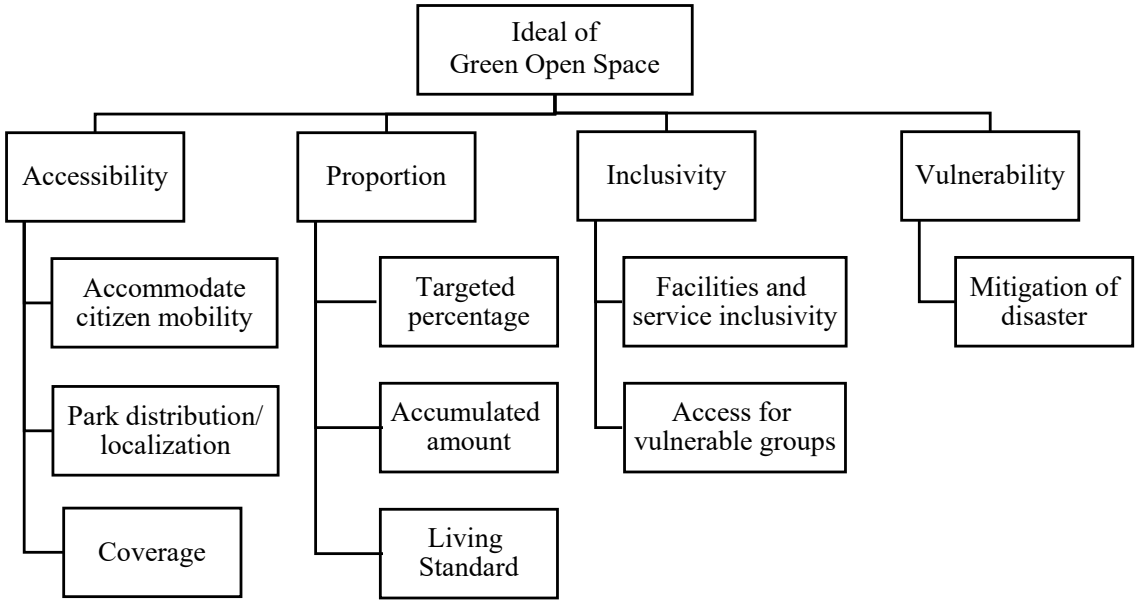

Fig. 1. Theoretical Framework of Study

Table 1. Aspect of Analysis and explanation

No	Aspect of Analysis	Explanation
1	Accessibility	It analyses some factors such as accommodate citizen mobility, park distribution and localization, and coverage
2	Proportion	It analyses the targeted percentage, accumulate amount and living standard
3	Inclusivity	It analyses the facilities and service inclusivity
4	Vulnerability	It analyses the possibility of disaster

Source: Authors, 2024.

Research Methodology

The study uses a qualitative approach to address the research question, providing an in-depth understanding of the emerging case within its context using various data sources (Creswell & Poth, 2018). The research is descriptive and exploratory, supported by some numerical data to enhance precision. It involves the analysis of urban sustainability variables using both primary and secondary data. Geographic Information Systems (GIS maps) are used to visualize spatial availability and distribution, emphasizing accessibility. A neighborhood map is utilized for precise output. In-depth interviews were conducted with seven influential individuals, including government officials from Jakarta's Department of Parks and City Forests, an Urban Planner specializing in Jakarta, an Architect involved in Jakarta's Child-Friendly Integrated Public Space (RPTRA), a Real Estate Manager specializing in South Jakarta, a Professor in Landscape Management and Ecology, and a Book Author on green open space. These individuals were chosen based on their expertise. The data from these interviews were transcribed in full and analyzed using NVIVO software.

The analysis is divided into three phases. First, the study delves deep into exploring the current policy landscape in Jakarta. Secondly, the article analyses the convergence of the policy towards the implementation using target indicators. Finally, we evaluate the challenges of implementing the ideal Jakarta policy based on the perspectives of experts, the government, and users. The three phases are connected and interlinked to provide a comprehensive overview of the green open space policy, achievements, and challenges. The aspect of analysis can be seen on the Table 1.

GREEN OPEN SPACE POLICIES IN JAKARTA

The management of green open spaces in Indonesia involves multiple government bodies and agencies, each with its own rules and regulations for development plans. While Law Number 26 of 2007 applies nationwide, the capital city of DKI Jakarta has specific policies that influence the allocation of green open spaces, including parks, forests, and graveyards. It is important to unify these policies across all levels of government to ensure effective functioning. This requires synchronized efforts at the local and national levels to reach a standardized agreement that considers existing interests and practices. Table 2 outlines the progression of nationwide policies for green open spaces.

The Law No. 26 of 2007 on spatial planning is the main regulation governing 30% of Green Open Space (GOS), with 20% being publicly owned and 10% privately owned. However, the policies resulting from current laws and regulations often do not adequately consider the well-being of people with disabilities, leaving them vulnerable in society. In response, the Indonesian government passed Law No. 19 of 2011 to endorse the Convention on the Rights of Persons with Disabilities (CRPD). Article 3 of this law sets out the principles that must be upheld in all aspects of state and community administration. These principles include ensuring equal opportunities for persons with disabilities, respecting, protecting, and upholding their rights, including accessibility and appropriate accommodation. This article ensures that development directives take into account the needs of people with

Table 2. Progression of Nationwide Policies on Green Open Space

No.	Law/Regulation	Objectives	Realization
1.	Minister of Home Affairs Instruction No. 14 of 1988	Ideal green open space proportion is 40% of total area	Only 13% have been fulfilled
2.	Law Number 26 of 2007	Ideal green open space proportion is 30% with 20% public space and 10% private space	Only 27,6% have been fulfilled
3.	Regulation of the Minister of Public Works and Public Housing No. 5 of 2008	Ideal green open space proportion is 30% with 20% public space and 10% private space	Only 27,6% have been fulfilled
4.	Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency Number 14 of 2022	Ideal green space proportion is reduced to 20%	Not yet determined

Sources: Dwi and Santoso (2010) , Manan (2016), Prakoso and Herdiansyah (2019) and Dinas Pertamanan dan Hutan Kota (2022).

Table 3. Progression of Regional Plan on Green Open Space in Jakarta

No.	Law/Regulation	Condition	Realization
1.	*Rencana Induk Djakarta 1965-1985* (Jakarta Master Plan)	Large proportion of Jakarta area is filled with green open space (37%)	Large areas of green open space taken away due to development of hotel (27%)
2.	*Rencana Tata Ruang Jakarta 1985-2005* (Spatial Planning of Jakarta 1985-2005)	Similar proportions of green open space (20-30%)	Green open space Development of housing and shopping centres are
3.	*Rencana Tata Ruang Wilayah Jakarta 2000-2010* (Spatial Planning of Jakarta 1985-2005)	An immense decrease in green open space	The smallest percentage of GOS available due to massive re-development of green spaces for housing and governmental building
4.	*Rencana Tata Ruang Jakarta 2010-2030* (Spatial Planning of Jakarta 2010-2030)	Reclaiming more urban green spaces to improve air quality	Increasing trend of Hutan Kota in populated areas

Sources: Dwi and Santoso (2010) , Manan (2016), Prakoso and Herdiansyah (2019) and Dinas Pertamanan dan Hutan Kota (2022).

disabilities by creating a safe environment and recognizing the importance of disability-friendly facilities and spaces in green open spaces.

CURRENT STATUS OF GREEN OPEN SPACE BASED ON URBAN SUSTAINABILITY INDEX

The study used three indicators to achieve the GOS target in the urban sustainability principle: accessibility, proportion, inclusivity, and resilience to disaster.

Indicator 1: Accessibility

The accessibility indicator is measured by the ease of access. People should be able to travel with proper public transport connections. In the case of Jakarta, people can easily access the park. The study shows that public transport connectivity to green open spaces impacts green open space policies and mobility policies, thereby intensifying the trend of developing green open spaces oriented towards transit hubs. However, it is found that building physical connectivity has emerged as a significant challenge in implementing green open spaces (Interview Urban Planner, 2023).

Accessibility plays a crucial role in shaping travel behavior, as the desire to travel depends on how the facilities around them safeguard their well-being. Existing infrastructure ensures the protection of vulnerable groups such as children, elders, and women, adhering to the essential concept of non-passive green open space accessibility for all

layers of society. Impeded access to green open spaces shows how the policy implementation process has failed all layers of society. One of the respondents said: "Most of the existing parks are not accommodating enough to those with physical disabilities, being non-inclusive as the facilities are not always friendly; some of the sidewalks do not have guiding blocks, are not wheelchair friendly, and there are no brakes available, which can be uncomfortable and hard for people to reach" (Interview, 2023).

The issue of accessibility extends beyond public spaces, as private entities also face challenges in providing green open spaces. Although private green open spaces may serve different purposes, the fundamental concept of these spaces is rooted in providing access to the general public. However, some privately managed green open spaces charge entrance fees (Interview, 2023). Table 4 displays the distribution of green open spaces in public areas.

Indicator 2: Proportion

South Jakarta has the highest total green open space build-up of any district in the city despite not having the largest landmass. This demonstrates its significant commitment to green spaces. The existing built-up green open spaces have greatly contributed to the total proportions set by existing policies. This can be attributed to historical spatial planning dating back to the pre-independence days when South Jakarta was primarily known as a plantation area. This is evidenced by most of its areas being named after specific products (Interview, 2023). Table 5 clearly illustrates the GOS proportions in DKI Jakarta.

While the ideal green open space proportions in every regional area are mandated to be at least 30% of the total area, according to Indonesian national law Undang-Undang Nomor 26 Tahun 2007, the basis of this regulation is to establish a standardized value that unifies the commitment of each region's spatial planning. However, when it comes to urban sustainability, the existing health and well-being factors play an equally important role in its implementation. The World Health Organization has emphasized the importance of a healthy living standard, requiring a per capita green space value of 9.5 square meters (m^2). This criterion enables an evaluation of

Table 4. Public Mobility Infrastructure Table

Public Mobility	Bike Road/Lane	Mass Rapid Public Transportation (BRT, TransJakarta, MRT, LRT, KRL)	Mass Public Transport and Feeder (Non-BRT and Mikrotrans)
Total Reach	289 GOS	351 GOS	1,088 GOS

Source: Adapted from ITDP and KataData (2022).

Table 5. Green Open Space Proportions in DKI Jakarta Province at 2022

No	District/City	Total Landmass (km^2)	Total Area of GOS	GOS %	Public Park (km^2)
1	Kepulauan Seribu	8.70	2.90631	33.41	0.06
2	Central Jakarta	48.13	0.82579	1.72	0.09
3	North Jakarta	140.00	0.83113	0.59	0.38
4	West Jakarta	124.40	0.02241	0.02	-
5	South Jakarta	141.27	3.2688	2.31	1.80
6	East Jakarta	182.70	0.00914	0.01	0.01

Source: Ministry of Environment and Forestry (2022).

Table 6. Gap of GOS in South Jakarta from WTO ideal

South Jakarta Population (2021)	Ideal Proportion	Current GOS	Gap from Ideal GOS
2,244,623 people	21,323,918.5 m^2	8,279,122.418 m^2	13,044,796.082 m^2

Source: Authors, 2024.

Table 7. Park Proportions Progression Table

2018		2019		2020		2021		Accumulated Amount up to 2021	
Realization	Target	Realization	Target	Realization	Target	Realization	Target	Realization	Target
25.63	28.63	16.80	12.5	19.27	12.5	13.88	10	75.58	63.89
0.039%	0.049%	0.025%	0.019%	0.0295%	0.019%	0.0212%	0.0151%	0.0115%	0.097%

Source: Strategic Planning of City Park and Forest, the Province of Jakarta (2018-2021)

sustainability at various scales and the consistency of urban green space (Anguluri & Narayanan, 2017).

According to WHO, the ideal GOS is 9.5 m^2 per person; the total population in 2021 was 2,244,623 people. Thus, the ideal GOS should be 21,323,918.5 m^2. In 2023, the GOS in South Jakarta was 8,279,122.418 m^2. Therefore, the gap between the existing and ideal conditions is 13,044,796.082 m^2.

Ideal green open space proportions are also mentioned in the national scope and are present in the national document on urban housing environmental planning released by Standar Nasional Indonesia (SNI), which functions as a frame of reference for planning, designing, and cost estimation. According to SNI 03-1733-2004, '*Tata cara perencanaan lingkungan perumahan di perkotaan*', green open spaces are ultimately intended to provide a reference for planners and designers, regional developers, and government officials with authority in the planning sector. SNI states that the desired proportions for green open space in land areas are based on the service capacity per population, with a standard of one m^2 per resident, which is then adjusted according to the size of the living area and population within one district. The standardized proportions decrease as the range expands, assuming shared accessibility for all.

Taking the most significant context of measurement set by SNI, which entails the required space per district (*kecamatan*), consisting of approximately 120,000 residents, it is expected that at least a land area of 2.4 hectares (24,000 m^2) is dedicated to green open space, with a set standard of 0.2 m^2 per resident. As the South of Jakarta currently possesses ten districts, with a population of 2,244,623 residents as of 2021, it is expected that the desired proportions based on SNI 03-1733-2004 are 240,000 m^2 or 24 hectares.

The city of Jakarta operates under a unique set of proportions outlined in the 2030 Master Plan, which is tailored to fit the city's specific context. Table 5 indicates a steady increase in the proportion of green open spaces (GOS) from 2018 to 2021. The COVID-19 pandemic in 2020 resulted in a significant rise in the demand for parks and open spaces due to social distancing restrictions in indoor areas. Parks, along with graves and forests, make the most significant contribution to the 30% green open space requirement. However, the increase in urban development has led to concerns about runoff absorption during heavy rainfall and flooding. The slow progress in implementing policies is evident in the gradual expansion of public parks in Jakarta over the years.

Indicator 3: Inclusivity of Green Open Space

The Minister for Women's Empowerment Regulation No. 2 of 2009 and the DKI Jakarta Provincial Governor Regulation No. 123 of 2017 must be followed. These regulations concern the Policy Child-Friendly Regency/City (*Kota Layak Anak*) and the management and needs for Child-Friendly Integrated Public Space Facilities and Infrastructure, abbreviated as RPTRA (*Ruang Publik Terpadu Ramah Anak*). While RPTRA may not be considered an ecological green open space due to its large concrete areas, it is an active space that fulfills several aspects of urban sustainability. RPTRA includes indoor facilities such as a multipurpose room, library room, lactation room, management room, family welfare development room (PKK), toilets for men, women, and disabled individuals, hand washing facilities, warehouse, and clean kitchen (pantry). Outdoor facilities include a sports field, children's play area, running track, reflection path, open stage, nutrition pool, family medicinal plant garden, bicycle parking,

and park benches.

The Child-Friendly Integrated Public Space may not fully meet the requirements of its designated area, but it is a fundamental aspect of urban sustainability in its natural development. This is achieved through the processes of social mapping and engineering. Social mapping involves taking into account the opinions of the community regarding their demographics, surrounding environments, and activities. This ensures that each sub-district's child-friendly integrated public space is distinctive and developed accordingly. Social engineering establishes the concept of a child-friendly integrated public space as a public entity that benefits society. The process ensures that citizens embrace these spaces, preventing conflicts and conflicts of interest among different societal groups (Interview, 2024).

Indicator 4: Resilience from Disaster

Green Open Spaces provide the ecological function of subverting natural disasters impacting people, while others provide the function of retention through mitigating the risks and impacts of disasters. GOS plays an important role as an area used for evacuation in times of danger. Law 91 of the Special Regional Regulation for the Capital City of Jakarta Number 1 of 2012 concerning Regional Spatial Planning for the Province of Daerah Khusus Jakarta states that a designated safe evacuation zone should at least have an area of 1,000 m^2 that is easily accessible in every sub-district. However, the designated safe evacuation area may not be sufficient for the population size and density of Jakarta.

Amongst all the existing natural disasters present in Indonesia, Daerah Khusus Jakarta is known to be a city that has suffered a high impact of flooding that has consistently occurred dating back to the fifth century due to the delta city's geographical location, which possesses several rivers flowing through the city (Budiyono et al., 2016). Recognizing this vulnerability has caused the regional government to release the DKI Jakarta Province Disaster Management Plan (RPB 2012–2017), in which Article 45 affirms the role of green open space to function as temporary water storage when high rainfall is at its peak. While the intensity of rain is not only the cause of floods, it is still relevant to other causes like land subsidence due to groundwater extraction due to the influx of population in recent years and rising sea water levels happening because of climate change. One of the respondents said:

> "Historically, Jakarta has had many reservoirs, ponds, or small lakes, but many of which have been turned into residential areas or buildings, and so on. It is a shame, so it is not surprising that at that time, a dam broke and flooded due to the lack of water storage places; it means that the reservoirs all go to the river, the river overflows, and the residents also do not build catchments, so it all overflows into the river and roads." (Interview, 2024).

Jakarta has been identified as the main area for addressing flood-related needs. This study utilized data from the INARISK database, a website that uses a GIS-based information system to display disaster risk studies, including hazard, capacity, vulnerability, and risk. The study also monitored the decline in the disaster risk index in Indonesia under the National Board for Disaster Management. The research used a map of flood-prone areas in South Jakarta City based on data gathered from the website, revealing that most areas have a medium to high flood proneness classification. Upon examining the current locations of parks in South Jakarta, it becomes clear that these parks are not always situated in areas directly adjacent to flood-prone water flows. Therefore, it is evident that several city parks are not solely built for the ecological purpose of water catchment, and there will be a need for a more strategically planned placement to ensure that they contribute to the urban sustainability index.

In summary, the study investigated the four indicators of an ideal Geographic Information System (GOS). It was found that the accessibility indicator can be achieved, but the proportion indicator has not yet been met. The

government is working towards fulfilling the ideal GOS as an indicator of inclusivity, and it is also addressing the fact that GOS is still prone to natural disasters.

CHALLENGES OF IMPLEMENTING GREEN OPEN SPACE POLICIES

Implementing GOS policy in South Jakarta face several challenges such as cost for implementation, distribution and governance problems.

Challenge 1: Cost of implementation

The concept of costs extends beyond financial incentives and encompasses the challenges associated with the implementation process. In rapidly urbanizing cities like Jakarta, the primary challenge is the cost of acquiring land for green open spaces. This is due to the competitive nature of using available space, making it difficult to prioritize the development of green open spaces in densely populated areas. Acquiring suitable land for these spaces is an expensive endeavour, often straining governmental budgets. Furthermore, developing green open spaces involves infrastructure costs beyond just construction. This includes creating facilities such as seating, lighting, waste management, pathways, and more, to ensure the park's functionality and public accessibility. Scientific research, innovation, and technology are also necessary to support ecological operations. Additionally, socio-economic measures such as placemaking and social engineering are important, albeit costly in terms of money, time, and the environment.

Challenge 2: Unequal Spatial Distribution

Distribution presents a significant challenge to implementing green open space policies in South Jakarta. This is because it aligns with the general policy overseeing all green open space policies, Law No. 26 of 2007 concerning Spatial Planning. This law stipulates that thirty percent (30%) of the city area should be green open space, with twenty percent (20%) owned by the public and ten percent (10%) by private entities. Although proportion does not directly correspond to distribution, the factors influencing distribution can affect the proportion, which poses a challenge to the green open space policy. The distribution procedure may become more complicated and expensive if integrating green spaces necessitates significant changes to the current infrastructure. The problem is mainly rooted in how the city has been built, as it does not allow for the creation of parks. This is not due to a lack of capability but rather because the priority in city planning has been to fulfil the "needs" of the people (Interview, 2023). Land-use competition demonstrates this phenomenon, as the development of residential, commercial, and industrial spaces is perceived as the more economically attractive option.

It is important to note that according to Law No. 26 of 2007 concerning spatial planning, 30% of Jakarta's total land area, which is 661.5 km^2, needs to be developed into green open spaces, equating to 198,450,000 m^2. However, the distribution of parks has the potential to exacerbate existing social inequalities. Neighborhoods with nearby parks may become more desirable and valuable, particularly in South Jakarta. This means that residents in affluent neighborhoods with higher purchasing power may have better access to and better-maintained green spaces compared to those in lower-income neighborhoods.

Challenge 3: Lack of green space priority in the urban governance

The government encompasses a network of organizations and officials working for the entire population. Its key role in policy implementation makes it a central factor influencing the challenges of implementing green open spaces. Whether at the central or regional level, the government faces challenges in planning, regulating, and providing public goods. This responsibility includes addressing the various layers contributing to green open

space. While a specific governmental organization, the Jakarta Provincial Parks and City Forest Service, is explicitly responsible for handling matters related to green open space, the implementation is based on a broader spectrum. The primary issue with green open space implementation is the potential competition from unfulfilled urgent needs such as public services, housing, and infrastructure development (Interview, 2023). More urgent and politically prominent projects, especially those with greater economic incentives, may take precedence over allocating attention to green spaces. Despite being mandated by law, policies regarding the proportion may perform differently than expected due to several constraints. The provincial government is entirely responsible for the 20% required proportion in Law No. 26 of 2007 concerning spatial planning; therefore, budget constraints remain relevant and interrelated. Land purchase, management, and development frequently require financial resources, burdening the government's limited budget structure. The government discourages land acquisition to a large extent due to the highly valued land prices in Jakarta, among other related matters outlined in policies (Interview, 2023).

The prioritization of green open space policies in Jakarta may be influenced by political cycles and immediate election concerns. Elected officials may prioritize projects that produce quick and visible results, potentially neglecting green open spaces, which may not yield immediate advantages and are not well understood by the general public. Another challenge is the enforcement of green open space policies, with questions arising about whether the set proportions are sufficient for all areas and whether they consider local wisdom. The implementation of Law No. 26 of 2007 concerning spatial planning proportions has yet to reach its full potential, especially in high-density areas like Jakarta. Some municipalities exceed the required proportions, while others struggle to meet them, indicating an apparent partiality in law enforcement.

CONCLUSION

Developing and implementing green open space-related policies in Indonesia, continue to underscore the crucial need for collaborative engagement among diverse stakeholders. With a constant omission over the inability to fulfil set requirements and ensure the 'ideal' execution of urban sustainability aspects, with the rapid intensification of urbanization movement and escalating environmental challenges, concerted efforts from government authorities are essential to ensure the practical preservation, expansion, and management of parks as an active green open space. As Jakarta and other Indonesian cities continue to develop, proactive and inclusive green open space policies must align with future developments in shaping an inclusive, resilient, and sustainable urban environment.

The findings illustrate that the existence of green open spaces through its policy implementation is still often regarded as an appended feature that belongs to something other than the prioritized directives over the years. Due to the existing conditions rooted in the factors of underlying costs, distribution, government, and accessibility, it prevails that the provisions of green open space in DKI a comprehensive examination of urban sustainability principles from various stakeholders' perspectives, this study has presented empirical evidence on the role of green open spaces as a public good in Jakarta. It emphasizes the importance of evaluating current policies related to green open space provisions and the gradual improvement of these provisions over time. The study also underscores the need for a more robust policy response and implementation process to address current and future challenges, as well as the importance of analyzing the relationship between public-private collaboration and revising policies to make them more attainable.

The study argues that a policy change should govern the proportions and existence of green open space. While a set percentage can be a determining factor, the implementation still needs to reflect the desired numbers. Therefore, a shift towards a focus on quality rather than quantity could be considered first to ensure for a better implementation and services provided; whilst still pushing for an increase in quantity to maximize its functions. Moreover, alternative management of green open spaces should be characterized by a centralized policy and

decentralized system to allow for better planning and supervision, and an in-line expenditure system to increase efficiency, done with considering the aspects of localization. Thus, a competitive policy that offers incentives to enhance collaboration with the private sector is necessary to address issues arising from market mechanisms, such as funding scarcity and rising land values. However, this study has a limitation on its scope that only focuses on the megacity Jakarta, thus future research may focus on implementing the policy in growing cities with different social and political dynamics. Furthermore, while the study examines a wide range of national and regional policies, it lacks specific focus on the policies implemented in South Jakarta due to their limited availability. Therefore, it calls for greater representation from legislative bodies and community groups. Future research in this area should delve into specific municipal policies relevant to various types of green open spaces and their respective areas, especially in light of the changing status of Daerah Khusus Jakarta (formerly known as *Daerah Khusus Ibukota* Jakarta, the capital city).

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인도네시아 남부 자카르타의 녹색 오픈스페이스 정책에 대한 분석

Rafa Nismara Dahayu and Erda Rindrasih

Faculty of Social and Political Sciences Universitas Gadjah Mada

녹지개방공간(Green Open Space, GOS)은 도시 환경 내 식물이 자라는 지역으로, 환경, 사회, 경제적 이점을 제공하는 다양한 기능을 가지고 있습니다. GOS는 도시 내에서 공존하기 위해 필수적입니다. 그러나 이상적인 녹지개방공간을 구축하기 위해 몇몇 도시들은 여러 가지 도전에 직면해 왔습니다. 특히 자카르타와 같은 대도시에서는 녹지개방공간 정책의 실행에 제한이 존재했습니다. 따라서 녹지개방공간 정책에 대한 연구는 중요합니다. 이 연구는 인도네시아 자카르타에서 녹지개방공간의 현 상태와 도전 과제를 확인하고자 합니다. 연구를 통해 자카르타의 현재 녹지개방공간 정책과 남부 자카르타 구역의 공원 제공은 법적으로 정해진 이상적 목표를 충족시키지 못하고 있음을 밝혀냈습니다. 이는 시스템 관리의 어려움과 정부 지침의 우선순위 하락으로 인해 그 존재가 가치를 잃고 있다는 것을 강조합니다. 더 나아가, 이 연구는 녹지개방공간 제공의 진전과 시도들을 강조하며, 이러한 진전이 점진적으로 이루어지고 있다는 점을 보여줍니다.

주제어: 녹지개방공간, 정책, 공원, 자카르타, 남부자카르타

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Corresponding Author
Erda Rindrasih
Department of Public Policy and Management
Faculty of Social and Political Sciences
Jl. Sosio Yusticia, Bulaksumur, Yogyakarta 55281
E-mail: erda.rindrasih@ugm.ac.id

저자

Erda Rindrasih

Erda Rindrasih obtained his Ph.D. from the International Development Studies, Department of Human Geography and Spatial Planning, Utrecht University the Netherlands. She focuses on the issues of urban and regional planning and policy, tourism development, and international development. Currently, he is an Assistant Professor at the Department of Management and Public Policy, Universitas Gadjah Mada. (erda.rindrasih@ugm.ac.id).

Rafa Nismara Dahayu

Rafa Nismara Dahayu is part of the recently graduated class of 2024 with a Bachelor of Arts in Public Policy and Management from Universitas Gadjah Mada. With a keen interest in the intersection of governance, green open spaces, and management, Rafa has actively engaged in various research projects and internships to address contemporary policy challenges. (rafanismara02@mail.ugm.ac.id).