

UDC 332

DISASTER MITIGATION IN PUBLIC GREEN OPEN SPACES WITH SUSTAINABLE DEVELOPMENT APPROACH

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ABSTRACT

In 2017 the Probolinggo City Government has compiled a Disaster Management Plan Support with infrastructure, policies and budgeting, public green open space management programs as a means of disaster mitigation must be socialized and involve other institutions so that efforts to increase the capacity of threatened areas can be successful. The management of public green open space as a means of disaster mitigation in Probolinggo City is fully supported by stakeholders according to their roles and functions. It is also necessary to pay attention to the management of public green open space as a means of disaster mitigation regarding governance, budget, regulation, supervision and human resources for managing public green open space. This activity needs to be socialized, so that the public knows the functions and benefits of the existence of public green open space. The existence of public green open space in Probolinggo City apart from being an environmental buffer has the potential to be developed as a disaster mitigation model with a sustainable development approach so that there are benefits from the ecological, educational, infrastructure, economic, socio-cultural aspects in accordance with the objectives of the SDGs.

KEY WORDS

Green open space, disaster mitigation, sustainable development goals.

Indonesia is currently experiencing a very significant decline in the quantity and quality of public open space, particularly Green Open Space (RTH). This has led to a deterioration in the urban environment, which has an effect on a number of aspects of urban life, including frequent disasters, increased air pollution, and decreased community productivity due to a lack of space for social interaction. The current development is primarily focused on filling urban spaces with infrastructure and utilities in the form of physical buildings, which is out of balance with the availability of sufficient open spaces, especially green open spaces (Achsani, 2016).

There is growing pressure for urban planning to play a bigger role in managing water resources as urban development's impact on the hydrological functions of water is becoming more widely recognized. Planning for green open areas in particular can be crucial because they support vital ecosystem functions, such as those that help with flood control (Schuch et al., 2017). Having access to public open spaces is essential for city living. Aesthetic, social, political, and economic requirements are all met by these locations. The size and scope of

public open spaces offered in a city often influence the level of development of a nation. Urban public open spaces serve a variety of purposes, such as recreation, offering services that draw and keep people in jobs, a lively culture, and talented people, and preserving a city's unique appearance, history, and beauty (Makworo & Mireri, 2011).

Efforts to develop open space are inseparable from the Regulation of the Minister of Public Works No. 05/PRT/M/2008 concerning Guidelines for Provision and Utilization of Green Open Space in Urban Areas, which is a derivative regulation of Law No. 26 of 2007 concerning Spatial Planning. The Minister of Public Works' Regulation requires the establishment of up to 30% green open space, which is accomplished gradually. The provision of green open space is based on three factors, including size, population, and the necessity for certain functions, according to the attachment to the Regulation of the Minister of Public Works published in 2008. The creation of green open space aims to assure the availability of spaces for biodiversity development, natural resource development, disaster mitigation/evacuation, and conserved areas for hydrological sustainability. Cities are intricate social-ecological landscape systems that are confronted with many difficulties, such as climate change, aging populations, the loss of natural resources, and intensive urbanization (Burkhard et al. 2010; McPhearson et al. 2014; Pickett et al. 2001). Particularly requiring a lot of resources, the construction industry puts a lot of strain on metropolitan environments. However, as urbanization continues to grow, it endangers human welfare, environmental services, and biodiversity in urban settings (Haase et al. 2014). Because of this, the current trend in urban landscape planning emphasizes the crucial role that green open spaces play in creating resilient urban landscapes and enhancing the wellbeing of urban society.

One of the most common calamities in the Probolinggo City Spatial Plan for 2009 to 2018 is floods. Probolinggo City is vulnerable to a number of disasters in addition to flooding, including strong winds, tidal waves that harm inhabitants' ponds and property, the threat of ash and cool lava gushing from Mount Bromo, and fires brought on by the city's dense population of buildings. The depletion of groundwater absorption caused by new dwelling structures has also resulted in numerous regions in the past few years experiencing water shortages during the dry season.

The Probolinggo City Government created the RPJMD in 2017 after compiling a Disaster Management Plan (RPB) Document. This document serves as a roadmap for adopting disaster management procedures in Probolinggo City so that it can be done more methodically, in advance, and without overlooking anything crucial. One method of disaster mitigation, particularly in metropolitan places like Probolinggo City, is to create a balance between the areas that are already there, whether they are being used for homes, businesses, offices, rice fields, or green open spaces. The Probolinggo City Regional Regulation No. 11 of 2018 Concerning Disaster Management regulates this type of balance that can prevent environmental harm and calamities.

THEORETICAL FRAMEWORK

Indonesia is a country with a high level of vulnerability to natural disasters. Its location at the confluence of the world's active plates can cause geological disasters. In addition, astronomically, Indonesia is located in the equatorial zone with a tropical climate with a risk of hydrometeorological disasters. This is an indication that in regional development plans, the government should not only be based on development needs, but also need to consider aspects of disaster hazards that can hinder sustainable development in this country (Taslim et al., 2017).

One of the development concepts that is currently a role model in various countries is sustainable development. The Government of Indonesia has outlined this sustainable development effort in Presidential Regulation Number 59 of 2017 concerning the Implementation of Achieving the Sustainable Development Goals. The Sustainable Development Goals, hereinafter abbreviated as TPB, are documents that contain global goals and targets from 2016 to 2030 (Perpres No. 59, 2017). The TPB has been compiled

and synergized with the Nawacita and the National Medium Term Development Plan (RPJMN) 2015 - 2019.

In accordance with Regulation of the Minister of Public Works Number 5 of 2008 concerning Guidelines for the Provision and Utilization of Green Open Spaces in Urban Areas, a Green Open Space (RTH) is a lengthy, open space where either naturally growing or artificially grown plants can be found. In the meantime, a green open space is a portion of an open space that is covered in plants, herbs, and flora in order to benefit from the security, comfort, welfare, and beauty of an area.

Green and non-green open spaces are the two types of public open spaces that are typically found in urban areas. Urban Green Open Space (RTH) is a term used to describe a portion of an urban area's open spaces that are planted with flowers, gardens, and other flora to support ecological, sociocultural, and architectural advantages that may bring about economic advantages (welfare) for the neighborhood. Blue open space, such as the surface of rivers, lakes, or locations designated as retention ponds, is another type of non-green open space (Dwiyanto, 2009).

A general planning document for the Regional Apparatus Work Unit (SKPD) for a period of 5 (five) years, the Strategic Plan of the Probolinggo City Environment Service for 2020-2024 is indicative and guided by the Regional Medium-Term Development Plan (RPJMD), as required by Government Regulation Number 8 of 2008 concerning Stages, Procedures for Preparation, Control, and Evaluation of the Implementation of Regional Development Plans. In order to ensure connections and consistency between planning, budgeting, implementation, control, and evaluation, the government enacted Law No. 25 of 2004 concerning the National Development Planning System, which mandates that Regional Development Planning is an integral part of the national development planning system. The Mayor of Probolinggo's vision, Building Together with the People for a Better, Just, Prosperous, Transparent and Sustainable Probolinggo City, as well as the third mission of realizing infrastructure and environmental development sustainable living, are both supported by the integration of the Environmental Agency's Strategic Plan with the Probolinggo City Medium-Term Development Plan (RPJMD).

An endeavor to organize green open spaces in the city to lessen the danger of occurrences or events that threaten and disturb people's lives and livelihoods is known as disaster mitigation via the management of Green Open Space (RTH). Physical advancement, increased awareness, and capacity building can all be used to mitigate the effects of disasters. Disasters are situations that pose a threat to, interrupt daily life, and may inflict deaths, property losses, environmental harm, and psychological effects due to both natural and human sources (HSEM, 2009 and TDMRC, 2010). By taking into account the evacuation routes and tsunami catastrophe zones that were developed by the Bali government in 2010, the green open space model for disaster mitigation can be used.

Application of macro and micro provincial space based on population, population density, and city spatial planning in the Sanur area. According to Rashifah (2019), the model is used with the function of the green open space as a discovery space identified to facilitate the process or travel alone and there can be casualties when an earthquake occurs. The model is applied with the division of the green open space as a zone in Sanur based on the social and geographical conditions currently in place, as well as several considerations like the division according to clusters in natural disaster mitigation procedures. An effort is being made to increase the role as a provider of environmental services, so one of the concepts is through the development of integrated green open space, also known as green infrastructure. The purpose of the existence of Public Green Open Space (RTH) and the relevance of disaster mitigation at this time is to increase those roles (IH). The development of green open space as an IH should, in accordance with Sinatra et al., (2022), be focused on improving urban aesthetics, health and welfare, integration and connectivity, disaster mitigation, and climate change adaptation.

METHODS OF RESEARCH

This study uses a qualitative research approach where qualitative research as a scientific method is often used and carried out by a group of researchers in the social sciences, including environmental sciences. This research was conducted in Probolinggo City, East Java Province. The determination of the research location was carried out intentionally, with the following reasons and considerations:

- Public Green Open Space (RTH) in the city of Probolinggo is a priority program of the Probolinggo City Government in order to follow up the explanation of article 29 paragraph 1 of the Law of the Republic of Indonesia number 26 of 2007 concerning Spatial Planning that Public Green Open Space is a green open space owned and managed by the local government of the city which is used for the benefit of the general public;
- The integration of the Environmental Agency's RENSTRA with the Probolinggo City Medium-Term Development Plan (RPJMD) in line with the Probolinggo Mayor's vision of building together with the people for a better, just, prosperous, transparent and sustainable Probolinggo City, as well as the third mission of realizing infrastructure development and a sustainable environment through improving the management of green open spaces in order to improve the quality of the urban environment through the preservation, prevention and control of environmental damage.

First, informants served as the study's data sources. The informant's position provided an answer to the researcher's questions. Second, documents, often known as archives, might take the form of formal records or written content. Data from interviews with informants who frequent the public green open space, the neighborhood, local leaders, stakeholders, and managers of the public green open space were used in this study. operational monitoring of the creation of public green spaces and recording of those activities. The method used in collecting information and data used in this research is Participatory Rapid Appraisal (PRA).

DISCUSSION OF RESULTS

Management of Public Green Open Space (RTH) for disaster mitigation in Probolinggo City

Management of Public Green Open Space (RTH) for disaster mitigation as an effort to anticipate, adapt, protect, and minimize regional threats, as well as have the capacity to absorb information. The resilience of the community independently in disaster management is the first in every disaster management effort through Provision of Public Green Open Space (RTH) for disaster mitigation and Provision of supporting facilities and infrastructure for disaster mitigation in the Public Green Open Space (RTH).

The existence of the Regional Disaster Management Agency (BPBD) of the City of Probolinggo for disaster mitigation

Disaster management places green open space (RTH) as the backbone of disaster alert city development. Disaster-prone points (floods, fires, earthquakes) are used as starting points for assessment and city planning for disaster alerts. According to the Probolinggo City BPBD (2021), Building public awareness, especially in disaster-prone locations, to voluntarily switch to urban and livable flats will provide evacuation routes. Others, disaster evacuation rooms, water catchment areas, economical transportation costs, saving the burden of collective living costs using electricity and clean water, hygienic sanitation, environmental hygiene, waste management, forming a culture of healthy behavior, and responding to disasters. In the Probolinggo City Regional Regulation Number 1 of 2020 concerning the Probolinggo City's Regional Spatial Plan (RTRW) for 2020-2040, it has been determined that in Probolinggo City there are several disaster-prone areas such as floods, strong winds, tidal waves that damage residents' land and ponds, the threat of ash and cold lava flooding of Mount Bromo, as well as fires caused by the high density of buildings.

The role and participation of the community in realizing the Public Green Open Space (RTH) as a model for disaster mitigation in Probolinggo City

The role and participation of the community in realizing the Public Green Open Space (RTH) as a model for disaster mitigation in the City of Probolinggo can be implemented through awareness and participation in the environment so that public green open space management innovations are born as a disaster mitigation model. The community's response, which was initially considered lacking in terms of disaster mitigation, is expected to become more with the use of the existence of public green open space as a medium to carry out cooperation and development activities in various community activities so that they can benefit from ecological, social and economic factors, as for institutions and community groups. It is:

- Involvement of the Environmental Cadre Association (PAKERLING);
- Involvement of the Community Women's Environment;
- Involvement of the People with Disabilities Group Caring for the Environment of Probolinggo City (PECEL KOPROL);
- Involvement of the Biodiversity Conservation Community (KOMTARI KEHATI);
- Involvement of Ceria Garbage Cart Puller (PGS CERIA);
- Involvement of the Pedicab Brothers Community Care for the Environment (Paguyuban Abang Becak Peduli Lingkungan).

Disaster Mitigation with a Sustainable Development Approach in Public Green Open Space (RTH) in Probolinggo City

In relation to the disaster mitigation model with a sustainable development approach in the Public Green Open Space (RTH) in the City of Probolinggo, efforts to improve the quality and innovation of the public green open space management model as a sustainable development plan for disaster mitigation as well as resource potential development related to SDG's, Public Green Open Space Managers are required to seeks to improve the welfare of society, social dynamics and maintain ecological harmony.

- Public Green Open Space (RTH) data as disaster mitigation. The green function in public green open space as the 'lungs of the city', is actually only one aspect of the ongoing recycling function, between carbon dioxide (CO₂) and oxygen (O₂) gases, the result of photosynthesis, especially in leaves. This green system is like the function of air ventilation in a house. Moreover, there are many functions of TWSL, including aesthetic functions that are useful as a source of active and passive public recreation, which are manifested in the green corridor system as a land spatial control tool in an urban park system. Apart from being about how to deal with the impacts of global warming and cities and protecting natural resources, public green open space also functions as a source of water reservoirs and a regulator of the hot and humid tropical climate (shade). The realization of public green open space (RTH) management policies and models as disaster mitigation related to the SDG's goals as the goals of the 1st Sustainable Development Goals (SDG's) on alleviating all forms of poverty and the 13th Sustainable Development Goals (SDG's) on how to deal with the impacts of warming global.
- Data on Public Green Open Space (RTH) as a means of tourism, ecological and socio-economic. The policy and model of the Management of Public Green Open Space (RTH) as a tourism, ecological and socio-economic means is related to the 11th SDG's goal of inclusive, safe, resilient, and sustainable cities and human settlements. And the 15th Sustainable Development Goals (SDG's) concerning the protection of natural resources and wildlife (land ecosystems)

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Potential Management of Public Green Open Space (RTH) for disaster mitigation in Probolinggo City

Regarding the potential of Public Green Open Space Management (RTH) for efforts to reduce the threat of disaster areas in Probolinggo City, there are opinions from several respondents from this study. Currently, green open space in Probolinggo City can function as a means of disaster mitigation and what needs to be considered is the mapping of public green open space in accordance with disaster-prone potential so that it is in accordance with the planning and utilization of the green open space. Public Green Open Space (RTH) can be used as a means of disaster mitigation and there is a need for mapping, Public Green Open Space (RTH) in accordance with the potential of disaster-prone areas in Probolinggo City, and Public Green Open Space (RTH) as a means to minimize threats the disaster area must be compatible with the vegetation in the Public Green Open Space (RTH). Disaster mitigation is different from preparedness, mitigation is more directed at efforts to prevent or anticipate disasters. The function of the Public Green Open Space (RTH) is an effort to anticipate the impact of the "greenhouse" or agro climate.

One of the efforts to prevent or anticipate the impact of global warming is to maximize the existence of public green open space. The management of public green open space needs to be monitored and evaluated so that we can anticipate disasters. Capacity building for areas threatened by disasters has been carried out by the Environmental Office of the City of Probolinggo by providing public green open space, for this reason it is necessary to support relevant agencies and institutions so that supporting facilities and infrastructure so that the purpose of utilizing public green open space as a means of disaster mitigation can be fulfilled. Disaster mitigation innovation in public green open space can be a strategic step considering the level of disaster vulnerability in Probolinggo City is in a moderate position, this is in accordance with the 2019-2024 Vision and Mission. To be more targeted and sustainable, the management of public green open space must also pay attention to several supporting factors. In order for the management of public green open space to be more targeted and sustainable, a road map must be made relating to:

- Technical regulations related to the management of public green open space and disaster mitigation;
- Campaign or socialization on the use of public green open space as a means of disaster mitigation;
- Fulfillment of disaster infrastructure facilities in public green open space;
- The existence of partnerships with other institutions including CSR.

The existence of public green open space as a means of disaster mitigation must be supported by infrastructure, policies and budgeting. In addition to being supported by

infrastructure, policies and budgeting, the public green open space management program as a means of disaster mitigation must be socialized and requires the involvement of other institutions. To minimize the threat of the area, it is necessary to have a mapping of public green open space in accordance with the potential of disaster-prone areas and the suitability of the vegetation in the public green open space. The management of public green open space needs to be monitored and evaluated so that we can anticipate disasters. In addition to being supported by infrastructure, policies and budgeting, the public green open space management program as a means of disaster mitigation must be socialized and requires involvement from other institutions as an effort to increase the capacity of threatened areas to succeed.

The role and participation of the community in realizing the Public Green Open Space as a model for disaster mitigation in Probolinggo City

To analyze the role and participation of the community in realizing Public Green Open Spaces as a model for disaster mitigation in the Probolinggo City area by knowing the influence of community roles and participation which is very likely to be a supporting or inhibiting factor for the management of Green Open Space (RTH). Public researchers use the methodology of stakeholder mapping analysis (Stakeholders mapping). The role of Stakeholders as a supporting factor for the management of Public Green Open Space (RTH) as a model for disaster mitigation in the City of Probolinggo

- The Environment Agency provides public green open space, accommodation and human resources for disaster mitigation facilities;
- Probolinggo City BPBD as disaster technical implementer provides accommodation related to disasters and human resources in public green open space management activities as disaster mitigation in Probolinggo City;
- The Probolinggo City Administration Assistant prepares the governance, budgeting and regulation of public green open space as disaster mitigation;
- The DPRD of Probolinggo City prepares the budget and regulations for public green open space as disaster mitigation;
- FPRB is a social institution engaged in disaster (volunteer) which was formed with the aim of reducing disaster risk in Probolinggo City;
- The involvement of academics in the management of public green open space as disaster mitigation in the city of Probolinggo is very necessary in order to manage public green open space more effectively and efficiently;
- Journalists play a role in disseminating the management of Public Green Open Space (RTH) as a means of disaster mitigation in the Probolinggo City area to the public through print and electronic media;
- Environmental observers play a role in supervising and providing input on the management model of the Public Green Open Space as a means of disaster mitigation in the Probolinggo City area;
- Visitors of Public Green Open Space participate in supervising the management of the Public Green Open Space as a means of disaster mitigation in the Probolinggo City area;
- The community around the public green open space participates in supervising the management of the public green open space as a means of disaster mitigation in the Probolinggo City area.

The inhibiting factor for the management of Public Green Open Space (RTH) as a model for disaster mitigation in Probolinggo City:

- There is no standardized governance regarding the management of public green open space as a means of disaster mitigation;
- There is no budget readiness to realize public green open space as a means of disaster mitigation;

- There is no regulation (Perwali) regarding the management of public green open space as a means of disaster mitigation;
- The need for socialization to the community about the management of Public Green Open Space (RTH) as a model for disaster mitigation in Probolinggo City;
- Human Resources (HR) in the Public Green Open Space who control disaster are not maximized.

The management of public green open space as a means of disaster mitigation in Probolinggo City is fully supported by stakeholders, but it is also necessary to pay attention to governance, budgets, regulations and human resources. This activity needs to be socialized, so that the public knows the functions and benefits of the existence of public green open space.

Disaster Mitigation Model with Sustainable Development Approach in Public Green Open Space (RTH) in Probolinggo City

Public Green Open Space (RTH) as disaster mitigation:

- The 1st Sustainable Development Goals (SDG's) on alleviating all forms of poverty. The realization of public green open space (RTH) management policies and models as disaster mitigation is related to the 1st SDG's goal of alleviating all forms of poverty, using various perspectives to describe poverty, and therefore requires various coordinated responses. Through the management of public green open space, the Probolinggo City Government provides resources and services to help free them from poverty in a targeted manner. The public green open space management model as disaster mitigation will certainly reduce poverty as a result of natural disasters.
- The 13th Sustainable Development Goals (SDG's) on how to deal with the impacts of global warming. Local governments, especially in urban areas, often think hard in dealing with the impacts of climate change. The Probolinggo City Government in increasing its capacity to deal with the dangers of climate change and natural disasters seeks to improve the quality of the environment. Integrating climate change mitigation and adaptation into regional and city planning to reduce emissions and increase community resilience to environmental disturbances by improving environmental conditions and natural resource capacity as well as institutions in climate change mitigation, adaptation, impact reduction and early warning.

Public green open space is one of the flagship programs of the Probolinggo City Government to overcome environmental management problems in public green open space and facilitate, develop and implement efforts to handle and utilize City Forest Green Open Space through Regional Regulation Number 7 of 2008 concerning Organization and Work Procedures of Probolinggo City Regional Technical Institutions and Probolinggo Mayor Regulation Number 37 of 2008 concerning the Main Duties and Functions of the Environmental Service. Efforts to innovate policies through the public green open space management program have the implications of being awarded the "Indonesia Green Awards 2014" for the green city category.

Green Open Space (RTH) Public as a means of tourism, ecological and socio-economic. Public Green Open Space (RTH) Management policies and models as tourism, ecological and socio-economic facilities are related to the SDG's objectives:

- The 11th Sustainable Development Goals (SDG's) concerning cities and human settlements that are inclusive, safe, resilient, and sustainable. Implementing the strategy implemented by the Probolinggo City Government through the Regional Medium-Term Development Plan (RPJMD) for 2020-2024 with the indicator that the percentage of urban population lives in slum areas; the percentage of households in urban areas according to the treatment of waste; and green open spaces in urban areas. In an effort to create inclusive, safe, resilient, and sustainable population settlements, the Probolinggo City Government manages public green open space

whose function is as a tourist, ecological and socio-economic means, so as to create urban planning and settlements that can prosper the community;

- The 15th Sustainable Development Goals (SDG's) on the protection of natural resources and wildlife (land ecosystems). The existence of public green open space, one of which is the Environmental Study Tourism Park (TWSL) is a place of captivity and protection for flora and fauna. TWSL has an environmental conservation education program that aims to change people's behavior to be more concerned about the environment and ensure that biodiversity conservation is a top priority in stopping biodiversity loss and preventing extinction.

CONCLUSION

Based on the description of the data in front and some emphasis as well as explanations at several points of the description, a common thread can be drawn that the City of Probolinggo is a city with a moderate level of vulnerability with a value of 108.30. Natural disasters that often occur are tidal waves, building fires, strong winds, floods and cold lava floods from the eruption of Mount Bromo. The management of public green open space as a means of disaster mitigation in Probolinggo City is fully supported by stakeholders according to their roles and functions. It is also necessary to pay attention to the management of public green open space as a means of disaster mitigation regarding governance, budget, regulation, supervision and human resources for managing public green open space. This activity needs to be socialized, so that the public knows the functions and benefits of the existence of public green open space. The existence of public green open space in Probolinggo City apart from being an environmental buffer has the potential to be developed as a disaster mitigation model with a sustainable development approach so that there are benefits from the ecological, educational, infrastructure, economic, socio-cultural aspects in accordance with the objectives of the SDGs.

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