Environmental Justice in Waste Management Policy: A Case of Antang Landfill in Makassar City

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Abstract

Environmental justice refers to the idea that all individuals regardless of race, skin color, nationality, ability, or income are entitled to equal protection from environmental and health hazards, as stipulated in Article 9 paragraph (3) of Law Number 39 of 1999 on Human Rights, which states that *"Every person has the right to a good and healthy environment"*. In this context, environmental justice within waste management policies has become an important and timely issue to examine, particularly in strategic areas such as Antang, which is home to a significant portion of Makassar's population, with the Antang Landfill (TPA Antang) serving as a focal point of concern. This study aims to assess the extent to which the principles of environmental justice have been implemented in accordance with binding regulations and how waste management policies can be made more equitable for the affected communities. Using a qualitative case study approach, this research draws on observations, interviews, field notes, environmental surveys, and document analysis. The findings indicate that the principles of environmental justice have not been effectively realized within the existing waste management policies. Local residents continue to bear environmental burdens, particularly air and water pollution, while public participation mechanisms remain insufficient. These findings underscore the need for reformulating waste management policies to ensure greater fairness, inclusiveness, and ecological sustainability. They are also expected to serve as strategic considerations for policymakers, legal practitioners, and the wider public in strengthening equitable, participatory, and sustainable waste governance.

Keywords: Environmental Justice; Waste Management; Antang Landfill; Public Participation; Makassar City.

1. Introduction

The concept of environmental justice first developed in social movements in the United States in the 1980s, pioneered by figures such as Robert D. Bullard, who

exposed the unequal distribution of pollution burdens on minority and low-income groups. Theoretically, environmental justice is the idea that all people, regardless of race, color, national origin, ability, or income, should receive equal protection from environmental and health hazards [1]. As stipulated in Article 9 paragraph (3) of Law Number 39 of 1999 concerning Human Rights (HAM Law), which reads, "Everyone has the right to a good and healthy environment" [2]. In this context, environmental justice in waste management policy is a hot issue that is interesting to study, especially in strategic areas such as Antang Village, Manggala District, which is the final destination for waste in the city of Makassar.

In theoretical studies, environmental justice is not only understood as an issue of ecological burden distribution, but also encompasses three main dimensions as described by Schlosberg (2007), namely distributive justice, procedural justice, and recognition justice [3]. These three dimensions are an important framework for assessing the extent to which environmental policies provide equal protection to all levels of society. Meanwhile, waste management policy is globally defined as a systematic approach to reducing, processing, and minimizing the impact of waste on health and the environment, as emphasized by the United Nations Environment Programme [4].

A number of international studies show that waste management policies in many developing countries often reflect structural injustice, mainly because landfills tend to be located in areas inhabited by low-income communities or vulnerable groups. This phenomenon is known as "waste inequity," which has been empirically observed in major cities such as Manila, Bangkok, and New Delhi [5]. This inequality is exacerbated by weak public participation in the formulation of environmental policies, resulting in affected groups lacking bargaining power to influence decisions regarding landfill locations or waste management mechanisms. In the Indonesian context, various studies show that the implementation of Law No. 18 of 2008 still faces challenges in the form of weak supervision, law enforcement, and a lack of integration of environmental justice principles into regional policies. This makes the issue of environmental justice in waste management a recurring problem.

The city of Makassar, as a metropolitan center in Eastern Indonesia, faces serious challenges in waste management, along with a population growth that reached 1.5 million in 2023 [6]. This increase in waste volume has a direct impact on the burden of management, especially at the Antang Final Disposal Site (TPA), which is the main waste disposal site for the city of Makassar. Every day, the Antang TPA receives more than 900 tons of waste, causing increasing pressure on its capacity and the quality of the surrounding environment [7]. Waste management at the Antang FDS is not only a technical and administrative issue, but also a matter of environmental justice. The literature shows that low-income communities and vulnerable groups often bear the

greatest impact of waste management activities, including air pollution, groundwater contamination, health risks, and a decline in quality of life [8]. In the Indonesian context, research also confirms that landfills are often located in areas inhabited by low-income communities, resulting in unequal distribution of environmental burdens [9]. This highlights the need for environmental justice analysis in every regional waste management policy.

Globally, the application of environmental justice principles has become an important indicator in the framework of sustainable waste governance, where waste management is assessed not only from a technical perspective but also in terms of the extent to which policies are able to protect the rights of affected communities, guarantee public participation, and ensure fair distribution of risks. International organizations such as UNEP and the World Bank emphasize that waste management must be based on human rights, including the right to a healthy environment, access to information, and involvement in decision-making processes. Thus, the analysis of environmental justice in the context of the Antang landfill is not only relevant locally but also in line with the global discourse on inclusive and equitable environmental governance.

A number of previous studies have examined the issue of waste management in various major cities, such as Jakarta, Surabaya, and Bandung, highlighting issues of landfill capacity, socio-ecological impacts, and the effectiveness of government policies. However, specific studies on the Antang landfill in Makassar are still limited, especially those that link waste management issues to the perspective of environmental justice. Several studies on the Antang landfill have focused more on technical aspects such as potential pollution, methane emissions, or ecological damage, but few have discussed in depth how local government policies impact the distribution of benefits, environmental burdens, and the protection of communities surrounding the landfill [10].

This gap shows that there is room for research to examine how Makassar City's waste management policy is implemented and to what extent environmental justice is accommodated in the policy. The concept of environmental justice encompasses three main dimensions: distributive justice, procedural justice, and recognition justice (Schlosberg, 2007). These three dimensions are an important framework for analyzing whether waste management policies have involved affected communities fairly, distributed burdens and benefits proportionally, and respected the social rights of vulnerable groups.

Against this background, this study aims to analyze waste management policies in Makassar City from the perspective of environmental justice and identify various forms of environmental injustice experienced by communities living around the Antang landfill. This analysis is expected to provide a comprehensive picture of

the extent to which existing policies are able to ensure the fair distribution of environmental risks and benefits, while also revealing the socio-ecological realities directly experienced by the affected communities.

The novelty of this research lies in the comprehensive integration of regional policy analysis with the concept of environmental justice, as well as its focus on the Antang landfill as one of the strategic landfills in eastern Indonesia that has not been widely studied. This research is expected to contribute theoretically to the study of environmental justice and provide practical recommendations for the Makassar City government to realize fairer, more sustainable waste management that is responsive to the needs of the affected communities.

2. Method

This study uses a normative-empirical approach to analyze the application of environmental justice principles in waste management at the Antang landfill. According to Jonaedi Efendi, Ibrahim, and Se (2018), normative-empirical legal research combines the study of legal norms, legislation, and legal doctrine with relevant empirical data to understand the application of law in social practice. In this study, empirical data was obtained from secondary sources, such as academic journals, research reports, government documents, and publications related to the management of the Antang landfill and health and environmental issues in the surrounding area [11]. This approach allows for a comprehensive analysis of the implementation of environmental justice principles, including the dimensions of distribution, procedure, and recognition, as well as the identification of challenges and impacts experienced by the community, based on information that has been documented academically.

3. Result and Discussion

The findings of this study relate to various forms of environmental injustice experienced by communities living around the Antang landfill, the extent to which these conditions reflect the principles of distributive justice, procedural justice, and recognition justice within Schlosberg's framework, and the extent to which Makassar City's waste management policies have integrated the perspective of environmental justice. These findings also show that unequal exposure to pollution, limited participation in the policy process, and the government's lack of recognition of community vulnerability contribute to systemic environmental injustice.

3.1 Makassar City Waste Management Policy from an Environmental Justice Perspective

Analysis of Waste Management Policy in Makassar City

An analysis of Makassar City's waste management policy is needed to

understand the extent to which the policies implemented are able to address the complexity of waste issues and protect the community from harmful environmental impacts. In this context, the effectiveness of local government policies, governance mechanisms, and the implementation of environmental justice principles are important aspects that need to be critically reviewed.

a. Local Regulations

Waste management in Makassar City is regulated within the main regulatory framework of Local Regulation (Perda) No. 4 of 2011 concerning Waste Management, which serves as a comprehensive and integrated legal umbrella. This local regulation is designed to create a healthy and clean environment free of waste by involving the active participation of the community and the business world in a proportional, effective, and efficient manner. This regulation contains important provisions related to waste reduction at the source, sorting of organic and inorganic waste, transportation, and final disposal at the Final Processing Site (TPA). In addition, the Perda regulates the prohibition of mixing waste with hazardous waste, littering, and the obligation to have a permit for waste managers. This regulation also provides sanctions as a law enforcement measure to ensure compliance with good waste management practices [12].

b. Mayoral Regulation

Local Regulation No. 36 of 2018, which regulates the technical and strategic aspects of waste management, focuses on the management of household waste and similar types of waste. The city government also encourages community-based management programs such as waste banks and the 3R (Reduce, Reuse, Recycle) program, which aim to reduce the volume of waste entering landfills and increase the economic value of waste through recycling. Studies show that the 3R program and waste banks have improved communication and understanding of waste management, although challenges such as transportation infrastructure and consistent community participation still exist [13].

c. Antang Landfill Revitalization Program by DLH

This strategic step addresses the waste management challenges that the city has been facing, especially those related to capacity and the environmental impact of the open dumping method used. The program includes modernizing landfill infrastructure by adopting a more environmentally friendly sanitary landfill system, which involves more effective management of leachate and methane gas to reduce pollution. In addition, the DLH has allocated a large budget for the expansion of waste management zones, improvement of access roads, and upgrading of the waste transport fleet to support the efficiency of waste management from upstream to downstream [14]. This revitalization program is also integrated with community education programs and the strengthening of waste banks as an effort to reduce the

volume of waste entering landfills [15]. The visit and appreciation from the Minister of Environment confirms the strong commitment of the Makassar City Government in transforming waste management towards a sustainable system based on a circular economy and modern technology, strengthening the synergy between the central and regional governments, and encouraging collaboration among all elements of society to maintain the cleanliness and health of the city's environment [16].

d. 3R Program, TPS3R, Waste Bank

Community-based waste management aims to reduce the amount of waste sent to the Tamangapa Final Processing Site (TPA) while increasing the economic value of waste. The Makassar City Government targets each sub-district to have an active TPS3R that is capable of independently processing organic and inorganic waste, thereby reducing the volume of waste sent to the TPA by 40-50 percent [17]. This program also promotes community empowerment through waste banks that facilitate waste sorting and the resale of waste with economic value, including plastic, which is now in demand by the recycling industry [18]. In addition, the Makassar City Government requires every neighborhood association (RT/RW) to have composters, eco-enzymes, and maggots in order to process organic waste ecologically and economically [19]. This processing technology not only reduces waste but also produces valuable products such as liquid fertilizer and animal feed. Various educational and campaign efforts are carried out continuously to build public awareness in sorting waste and maintaining environmental cleanliness, including in the industrial sector, which collaborates to build TPS3R to manage waste in an integrated manner [20]. This program comprehensively supports Makassar's vision of becoming a zero-waste city with a circular economy by involving the active participation of the community and the private sector as part of a synergy of modern and sustainable waste management.

e. Makassar Zero Waste 2029

The Makassar Zero Waste 2029 program is the long-term vision of the Makassar City Government to create a city that is almost free of waste through significant waste reduction and improved waste management based on a circular economy and active community involvement [21]. This program begins with the achievement of Zero Waste Households in 2028, which focuses on changing habits and local innovations such as strengthening waste banks, TPS3R facilities, and waste processing using maggots [22]. The Makassar Eco Circular Hub (ECH), launched as part of this program, serves as a center for collaboration among stakeholders to strengthen synergies and develop sustainable waste management systems in several pilot villages [23]. Additionally, Makassar Zero Waste 2029 targets a 50% reduction in waste through cross-sector collaboration, including the industrial, hotel, restaurant, and café sectors, as well as integration with urban farming [24]. This program does not only

stop at reducing waste volume, but also focuses on providing economic added value and maintaining the economic circulation of residents from home, thereby building collective awareness and real change in waste management across all elements of Makassar society.

f. Policy Relevance

This policy direction affirms Makassar City's commitment to a more sustainable and environmentally friendly future for waste management through waste reduction at source, circular economy-based processing, and innovations such as waste-to-energy for the Antang landfill. Thus, the policy is relevant and complementary within the framework of analysis which shows that although regulations and strategic plans are solid, technical implementation challenges, community participation, and funding must still be overcome in order to fully and sustainably achieve the vision of environmental justice at the Antang landfill in accordance with the targets. This policy not only ensures a reduction in the environmental burden but also provides direction for the transformation of waste management from mere disposal to a new economic resource through a cross-sectoral approach and active community collaboration [25].

3.2 Potret Empiris Kondisi TPA Antang sebagai Studi Kasus Utama

The Antang Final Disposal Site (TPA), also often referred to as the Tamangapa TPA, is located in Tamangapa Village, Manggala District, Makassar City. The location of this landfill is very close to residential areas, such as Antang Housing Complex, Indonesian Navy Housing Complex, Graha Janah Housing Complex, Griya Tamangapa Housing Complex, and Taman Asri Indah Housing Complex, so that residents in the surrounding area are directly affected by the existence of the landfill. The problems that arise include the pungent smell from piles of garbage, smoke from open burning of garbage (open dumping), leachate seepage that pollutes rivers and groundwater, and the proliferation of flies that are a source of disease for the surrounding community. These conditions cause various diseases, especially respiratory disorders, eye irritation, and skin infections experienced by residents living near the landfill [26].

Picture 1.1 Open Dumping

Social conflicts often arise due to residents' complaints about health and environmental impacts that have not been optimally addressed by landfill managers. Dependence on the open dumping system that is still in use causes pollution to continue and creates environmental inequality, with the surrounding community being the most disadvantaged by these unsustainable waste management activities [27].

Picture 1.2 Appearance of Overloaded Landfill

It should be clarified that Antang Landfill and Tamangapa Landfill are two names used for the same location. This refers to the fact that administratively, the landfill is located in the Tamangapa sub-district, but it is close to the Antang residential area, so the names of both areas are often used interchangeably. This landfill began operating in 1993 and is the only final disposal site for waste in the city of Makassar, serving all subdistricts in the city. Overcapacity, with waste piles reaching a height of around 50 meters on an area of approximately 16-20 hectares, has worsened the environmental and social situation around the landfill [28].

3.3 Forms of Environmental Injustice Experienced by Communities Living Near the Antang Landfill: An Examination Based on Schlosberg's Theory Waste management in the Antang landfill area in Makassar has long been a crucial issue, not only because of the high volume of waste that enters every day, but also because of the ecological and social impacts it has on the surrounding community. From the perspective of environmental justice according to Schlosberg (2007), injustice is not only related to the distribution of pollution burdens, but also to access to decision-making processes and recognition of vulnerable groups. The three dimensions of distributive, procedural, and recognition justice are an important framework for assessing whether the Antang landfill management practices have provided equal

environmental protection for all citizens.

The first injustice is evident in the distributive aspect, namely how the burden of pollution is felt more by poor communities around the Antang landfill. Research shows that groundwater quality in the area has declined significantly due to leachate seepage. Ningsih (2020) found that E. coli levels and other pollutant parameters in residents' wells exceeded clean water quality standards, indicating a high risk of skin diseases and diarrhea for people who use well water directly [29]. This condition confirms that groups living near landfills, who generally have low incomes, ultimately bear greater environmental risks than other groups. In addition to water, air pollution is also a serious burden. Thus, the ecological burden is not only uneven, but also places low-income communities in a position that is highly vulnerable to long-term health threats.

The problem of congestion on the access road to the Tamangapa landfill, especially on Jalan Antang Raya, which is filled every day with garbage trucks stopping on the shoulder and even on the road itself due to the lack of a special queuing area, shows that the injustice at the Antang landfill is not only a matter of pollution burden [30]. This is in line with Schlosberg's (2007) view that environmental injustice "is not only related to the distribution of pollution burdens, but also related to access to decision-making processes and recognition of vulnerable groups." In the case of the Antang landfill, the surrounding community and scavengers were never involved in important decisions such as truck queue arrangements, entrance road repairs, or handling of road damage within the landfill area, which is often muddy and flooded. The failure to provide space for affected groups to participate in policy making is a form of procedural injustice. As a result, technical decisions are made without considering the direct experiences of residents, so that problems such as congestion, disrupted access, and safety risks continue to occur without solutions that favor them.

The third dimension, namely recognition, can be seen from the health conditions of the communities living around the Antang landfill. Injustice in recognition occurs when the affected groups, in this case the poor residents living around the landfill, are not recognized for their identity, experiences, and vulnerability in the formulation of environmental policies. Astry Axmalia and Surahma Asti Mulasari reported that communities living less than one kilometer from the landfill experienced various health complaints, such as skin diseases, diarrhea, respiratory disorders, coughing, shortness of breath, and sore throats. These conditions show that the environmental impact is not only physical but also affects the social and humanitarian aspects of the surrounding residents [31].

4. Conclusion

The results of the study show that the form of environmental injustice experienced by the communities surrounding the Antang landfill is directly related to the research question regarding the extent to which Makassar City's waste management policies reflect the principle of environmental justice. Field findings show that communities within the immediate vicinity of the Antang landfill experience a disproportionate burden of risk, including exposure to pungent odors, reduced air quality, increased health problems, and a decline in quality of life, without receiving any ecological benefits or equivalent compensation. These findings clearly support the initial hypothesis, namely that waste management policies in Makassar are still not oriented towards the fair distribution of environmental burdens, resulting in environmental burdens being concentrated on low-income communities around the Antang landfill. Data from interviews with the community and field observations also show that there is no meaningful participation in decision-making regarding landfill management, thereby reinforcing the hypothesis that the principle of procedural justice has not been fulfilled.

When compared to the findings of other researchers, the results of this study are in line with a number of national and international studies that have found similar patterns in landfill areas in developing countries, namely that low-income communities tend to bear the brunt of environmental risks. Wahyuni's (2021) research, for example, found that residents living near the Tamangapa landfill in Makassar experienced similar conditions, particularly in terms of air and water quality. Globally, Bullard's (2018) research confirms that environmental inequality is almost always experienced by marginalized groups, both economically and socially. Thus, the findings of this study do not stand alone, but are consistent with the literature on environmental injustice in various countries.

However, there were a number of findings that were not entirely expected. For example, the communities surrounding the Antang landfill still showed relatively high levels of social and economic adaptation, including the emergence of informal economic activities such as scavenging, waste collection, and local trading. This shows that the existence of the landfill did not only have negative impacts, but also opened up new economic opportunities that were not fully predicted in the initial hypothesis. However, these economic opportunities do not negate the significant health risks and greater ecological injustice. The weakness of this study lies in the limited quantitative data on air and water pollution levels, so that some of the analysis still relies on residents' perceptions. Its strength lies in in-depth interviews that were able to explore the community's direct experiences of the injustice they feel.

Based on these findings, there are several new ways in which readers can interpret the results of this study. First, readers can view the Antang landfill not only as a technical issue of waste management, but as a structural problem related to social

inequality, governance, and policy bias. Second, the results of this study can be read within the framework of environmental human rights, specifically referring to Article 9 paragraph (3) of Law 39/1999 on Human Rights, which affirms the right of every person to a good and healthy environment [32]. This approach helps readers to see environmental injustice not only as a technical issue, but as a violation of the fundamental rights of citizens.

Regarding further research, there are still a number of aspects that need to be studied in greater depth, particularly regarding the scientific level of air pollution, the health impacts based on medical data, and an economic assessment of the environmental costs borne by the communities surrounding the landfill. In addition, further research is needed to assess the effectiveness of the Zero Waste and waste-to energy policies currently being planned by the government, including whether these policies have the potential to improve or worsen environmental injustice. Overall, the novelty of this study lies in its interdisciplinary analysis that combines legal, social, and environmental aspects in portraying environmental injustice at the Antang landfill, as well as explicitly showing how this injustice is inherent in waste management policies that are neither inclusive nor sensitive to vulnerable groups. Thus, this study provides a more comprehensive empirical and normative perspective on the issue of environmental justice in the context of Indonesian cities, particularly Makassar, without making exaggerated claims about the findings.

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work still has limitations. Therefore, any constructive suggestions and criticism are highly appreciated for the improvement of future research. Hopefully, the results of this study can contribute to the development of environmental justice studies and improve waste management policies in Makassar City.

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