



ENVIRONMENTAL JUSTICE AND HEALTH BURDENS IN MARGINALIZED COMMUNITIES NEAR WASTE SITES

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Abstract

This article examines the systematic direction of industrial waste toward low-income areas, creating environmental injustice and unequal health burdens for marginalized communities. The author argues that this risk concentration is sustained by biased spatial planning, commodified land valuation, and administrative routines that prioritize formal compliance over meaningful public participation. Marginalized residents often face "chronic uncertainty" due to constrained mobility, limited access to credible information, and the dismissal of their lived experiences by regulatory bodies. The discussion clarifies how three dimensions of justice distribution, procedure, and recognition interact to normalize these unequal protections. Ultimately, the article frames waste placement as a fundamental citizenship issue involving the right to a safe environment and equal protection. Because long-term exposure threatens intergenerational well-being, the author calls for a shift toward fair governance rooted in transparency, precaution, and accountability to dismantle these systemic inequalities.

Keywords: environmental justice, industrial waste, marginalized communities, spatial planning, risk distribution, procedural fairness, recognition.

Introduction

Modern industrial development is often understood as a marker of economic progress; however, this process always interacts with living space, environmental quality, and public health. In the daily lives of citizens, the quality of air, water, and soil are not merely technical categories, but fundamental requirements for working, learning, and caring for families. The balance between economic, social, and environmental aspects is crucial for creating public policies that are truly sustainable for the community (Mardikaningsih & Hariani, 2021). When that quality declines, the burden is felt through physical complaints, anxiety, and a diminished sense of security regarding the future. Efforts to improve the quality of life must begin with policies that prioritize health and equality for every citizen (Issalillah, 2021). In social experience, pollution rarely appears as a single event with clear boundaries. It tends to be embedded in routines, in lingering odors, in settling dust, in discolored water, and in the necessity of staying due to limited housing options. From this point, environmental issues cannot be separated from issues of justice, as ecological vulnerability is often intertwined with socio-economic vulnerability. Environmental damage then emerges as a matter of risk distribution, access to protection, and recognition of the dignity of affected citizens (Agyeman et al., 2016).

In many urban and suburban areas, the proximity between residential spaces and production spaces is a consequence of an economic growth-based urbanization model that places logistical efficiency as a top priority. Issues of building density and daily mobility in the suburbs often affect how close neighborly relations are in that environment (Wisnujati & Mardikaningsih, 2021). This process is explained in the theory of urban political economy, which shows that urban development often follows the interests of capital accumulation rather than the spatial well-being of citizens (Harvey, 1985). Industrialization that merges with settlements creates an urban landscape where production, distribution, and domestic life take place without clear physical boundaries. Amidst the hustle and bustle of the city, groups of people with similar interests usually form social networks to support one another (Rejeki, 2021). Although economically promoted as space efficiency and transport cost reduction, for low-income residents, such conditions mean continuous environmental exposure through industrial noise,

particulate emissions, machine vibrations, and liquid waste that disrupt health and daily comfort (Swyngedouw & Heynen, 2003).

This phenomenon is closely related to the concept of environmental inequality, which explains that social groups with limited resources tend to occupy high-risk spaces because land prices are lower and housing choices are limited (Bullard, 1990). Every sustainable public policy must have a strong legal foundation to guarantee the social welfare of all citizens (Rizky & Udjari, 2021). When basic services such as drainage, sanitation, and clean water do not develop alongside industrial expansion, ecological pressure becomes part of the family routine. Urban sociology studies show that ecological uncertainty affects household strategies in managing water consumption, food security, and children's education planning (Satterthwaite, 2003). Education plays a very large role in helping children from underprivileged families improve their fortunes in the future (Hartono & Sulisty, 2022). Thus, ecological inequality is not merely an environmental issue, but the result of spatial planning decisions, public investment priorities, and power relations that determine who bears the impact of economic externalities (Mohai et al., 2009).

Industrial waste is a prominent issue because it exists as production residues that must be moved, stored, treated, or disposed of. In fact, certain waste or refuse such as paper can still be reused through recycling to foster an entrepreneurial spirit (Nurmalasari & Mardikaningsih, 2022). In social practice, waste is often discussed as an object discarded from view, even though waste can persist in the environment and cause repeated exposure. The application of efficient management principles is highly necessary to reduce waste and improve service quality in various sectors (Radjawane et al., 2022). The placement of waste-related facilities may follow considerations of cost, distance, and ease of access for heavy vehicles, all of which intersect with the map of low-income settlements (Martuzzi et al., 2010). When a region is designated as a burden-receiving area, residents face a shift in residential identity, from a living space to a risk space. Perceptions of home value drop, business opportunities decrease, and social relations are strained by the conflict between the need for employment and the need for health. In this modern era, the use of big data is also beginning to bring many changes to how we conduct our social lives (Wahyudi et al., 2021). In such conditions, citizen complaints are often treated as a nuisance rather

than a signal of governance failure. This situation forms an experience of environmental injustice a state where ecological risks are concentrated on groups that have limited capacity to resist or recover.

Marginalized communities often face structural constraints in determining their residential locations and in obtaining effective legal protection. An individual's environmental concern is strongly influenced by their perspective and self-control regarding the surrounding nature (Nuraini et al., 2022). This inequality is rooted in the distribution of economic resources, weak land ownership status, and low political representation in public policy-making processes. The active involvement of citizens in protecting the surrounding environment through social support is very helpful in addressing ecological issues (Zulkarnain et al., 2021). The capability approach theory developed by Sen (1999) asserts that poverty is not just a lack of income, but a limitation of the actual capability to choose healthy and safe living conditions. In the context of industrial settlements, residents are often trapped in a dilemma between maintaining access to employment and facing health risks due to proximity to pollution sources (Ishikawa et al., 2015). Local communities also play an important role in preserving nature by combining traditional methods and modern knowledge (Nurmalasari & Nuraini, 2021).

These tensions demonstrate how ecological costs are often excluded from formal economic calculations. Beck (1992), through the concept of the risk society, explains that modernization produces an uneven distribution of risk, where vulnerable groups bear the heaviest consequences of industrial development. Strict law enforcement in environmental management is highly needed to ensure existing regulations are truly obeyed (Nuraini et al., 2021). This burden manifests in daily experiences such as increased health expenditures, loss of productive time due to illness, and a sense of powerlessness when environmental complaints receive no institutional response. A good leader must be able to provide honest public services and prioritize the interests of the many (Rojak, 2021). Therefore, the issue of waste and pollution is not only technical but also moral and political, as it concerns social recognition and justice in the distribution of development risks (Schlosberg, 2004).

Ecological inequality can be read as a form of distributional, procedural, and recognitional inequality working simultaneously.

Distribution concerns who receives exposure and who enjoys the economic benefits. Additionally, we also need to balance personal freedom and our responsibilities as part of society (Saputra & Darmawan, 2021). Procedural matters relate to who is invited to express an opinion, how information is disclosed, and how seriously residents' objections are handled. The political participation of citizens in a democracy is vital for driving change in society (Rojak et al., 2021). Recognition pertains to how institutions view citizens whether as equal rights holders or as parties that can be ignored. When these three dimensions converge, lower-class residential areas can become spaces that continuously receive waste burdens. This gives rise to a pattern of normalization, as if the state of pollution is a fair price for development (Walker, 2009). However, at the level of resident experience, this normalization means the forced acceptance of risk and a reduction in the capacity to plan life with dignity. Thus, discussions on the placement of industrial waste need to highlight the relationship between environmental governance, economic structure, and the social position of marginalized groups.

When industrial waste is directed toward low-income residential areas, issues arise regarding the unequal application of protection standards. In practice, oversight may be lax, technical information may not be easily accessible, and complaint procedures can be convoluted. Professional integrity in providing legal assistance is crucial to ensuring that justice remains upheld for everyone (Saktiawan et al., 2021). Residents often find it difficult to distinguish common nuisances from indications of serious exposure, while institutions may rely on technical language that distances citizens from understanding. Consequently, the space for public deliberation narrows, and the opportunity for policy correction decreases. Settlements that have long borne the burden may experience a strengthening stigma as "dirty areas," even though environmental cleanliness is closely linked to industrial decisions and governance. This situation creates chronic uncertainty in family life, as threats are not always visible but are felt. This issue also touches upon the dimension of intergenerational justice, as long-term exposure has the potential to alter the growth, development, and productivity opportunities of residents over a longer period (Brulle & Pellow, 2006).

The placement of waste near lower-class settlements also raises questions about policy legitimacy. When spatial decisions appear to consistently direct risk toward the same groups, public trust in institutions can erode. In this relationship, residents may feel that licensing and consultation procedures are mere formalities, making participation nothing more than the fulfillment of administrative requirements. Information asymmetry exacerbates the situation, as industries have access to experts, technical documents, and more effective communication channels. Residents, conversely, face limitations in time, cost, and advocacy capacity. As a result, the burden of proof and defense is often placed upon the weakest party (Ottinger, 2010). Such issues illustrate how environmental injustice does not always arise from overt actions, but from an accumulation of decisions that appear neutral yet produce unequal consequences for marginalized groups.

Scientific writing on ecological inequality and waste burdens on marginalized communities is important because it helps reshape ways of thinking about development and welfare. This issue integrates ethics, law, public health, regional planning, and the sociology of inequality. By examining how a region becomes a burden recipient, one can understand the mechanisms that cause risks to concentrate and persist. An emphasis on normative aspects is necessary to assess whether governance has met the principles of justice, precaution, and the protection of vulnerable groups. Furthermore, a structured discussion can clarify terms, conceptual boundaries, and the relationships between ideas so that public debate does not get trapped in one-sided accusations or narrow justifications. Through a systematic arrangement of arguments, this study can serve as a foundation for formulating more responsible policies and for strengthening the capacity of citizens to understand the rights and obligations of all parties (Pellow, 2000).

The problem statement in this writing is directed toward one focused scientific question: how social mechanisms, governance, and spatial planning drive the placement of industrial waste in lower-class residential areas, thereby producing environmental injustice and a disproportionate health burden for marginalized communities. This question centers attention on the relationship between institutional decisions, economic practices, and the lived experiences of residents

receiving exposure. Thus, the discussion can assess principles of environmental justice through the way risks are allocated, how procedures are carried out, and how residents are recognized as rights holders. This question also directs the discussion toward a normative realm that can be tested through argumentation, without depending on quantitative measurements. This focus allows for an organized explanation of why patterns of waste placement tend to replicate existing social inequalities.

The purpose of this writing is to formulate a conceptual understanding of the processes that place industrial waste burdens on lower-class settlements, and to affirm their implications for environmental justice and public policy ethics. The description is aimed at constructing an argumentative framework that links spatial planning, licensing procedures, information structures, and the social position of marginalized communities. This objective also includes sharpening normative categories to assess the fairness of risk distribution, the quality of citizen participation, and the responsibilities of both industry and the state. The results of this writing are expected to serve as a conceptual basis for formulating more equitable protection principles and to help readers understand the relationship between socio-economic vulnerability and ecological vulnerability in everyday living spaces.

Method

This study utilizes a qualitative literature study approach that positions texts as the primary source to build normative arguments regarding environmental injustice. The procedure begins with the formulation of conceptual keywords adequate for capturing the relationship between industrial waste, spatial planning, public health, and social inequality. The search and source selection process prioritizes scientific works, academic books, and policy documents that possess theoretical coherence and substantive relevance. Walliman (2021) emphasizes the importance of clarity in research design and consistency between research questions, selected materials, and the method of drawing conclusions. In line with this, Singleton and Straits (2018) position research design as a tool to organize material selection decisions, ensuring that the constructed reasoning remains accountable. In this study, texts are read iteratively to identify key

concepts, normative assumptions, and reasoning patterns that explain why waste burdens tend to be directed toward low-income settlements.

Material processing is carried out through thematic synthesis, organizing arguments into several conceptual clusters, such as risk distribution, procedural justice, recognition, and the ethics of protecting vulnerable groups. Sarantakos (2017) underscores that qualitative research demands sensitivity toward the social meanings embedded in practices, language, and power relations, ensuring that interpretation does not stop at formal definitions. Along a similar path, Beins (2017) emphasizes research as a living tool that trains reasoning precision, including the ability to distinguish between claims, reasons, and consequences. Because the objective of this study is normative, internal validity is maintained through the coherence of argumentation, the accuracy of conceptual usage, and the transparency of the reasoning flow from premises to implications. The writing process avoids numerical-based generalizations and focuses its attention on the construction of concepts and principled assessments of environmental justice in the placement of industrial waste.

Result and Discussion

Ecological inequality in the placement of industrial waste can be explained through the way space is defined as both a commodity and a living place (MacFarlane, 2019). When space is treated primarily as a means of economic growth, the value of a territory is often determined by investment attractiveness, logistical access, and profit potential. Within that framework, areas with low land prices and weak political bargaining power become natural candidates to accommodate activities considered disruptive. This creates a clear social segregation where the poor are often cornered into less healthy environments (Fauzi, 2021). This pattern is not a mere geographical coincidence, but the result of choices structured by power relations. At the citizen level, space is never neutral, as it holds histories of labor, social networks, and a sense of ownership over the surrounding environment. When waste is placed near lower-class settlements, what is harmed is not just environmental quality, but also the sense of security as a citizen (Papoli-Yazdi, 2021). Thus, the explanation must link the logic of space commodification with a framework of

citizenship namely, the right to a decent environment and the right not to be treated as a container for economic residues.

The accumulation of ecological burdens on marginalized groups often stems from the inequality of capacity to choose a living space (Rüttenauer, 2019). Housing choices are influenced by access to credit, job stability, and social position within the urban economic structure. Logan and Molotch (1987) explain that cities operate as a "growth machine," where spatial decisions are more influenced by economic growth interests than by the daily experiences of citizens. This condition indicates the existence of long-standing structural inequalities that make certain groups more vulnerable to environmental changes (Gani, 2022). Under these conditions, the voices of local communities rarely serve as the primary source of knowledge in industrial licensing, so spatial policies tend to ignore the reality of exposure experienced by residents.

When social and geographical mobility is limited, communities experience what can be called a forced attachment to risk spaces (Corburn, 2017). Giddens (1984) shows that social structures can limit the capacity of agents to act even when they are aware of the risks they face. Psychologically, pressure from this environment significantly influences how communities think and act in their daily lives (Darmawan et al., 2021). The impact is seen in changes to domestic practices, such as restricting children's outdoor activities, selective water use, or the intensification of household hygiene practices. The accumulation of these small adjustments results in long-term psychological and economic pressure. From a normative standpoint, these conditions affirm that the existence of environmental regulations alone is insufficient; what determines justice is how those policies work for the groups with the lowest bargaining power.

Environmental governance often builds a distance between policy language and the lived experience of citizens (Curran, 2018). Licensing documents, technical requirements, and standardized terminology can make it difficult for residents to understand what is being decided. This lack of understanding often arises from a lack of education and public awareness regarding their environmental rights (Gautama & Mardikaningsih, 2022). This gap creates epistemic inequality a difference in the ability to interpret risks and assess safety claims. Industry can present a narrative of compliance, while residents feel disturbances that are

difficult to translate into administrative parameters. When complaint mechanisms rely on formal evidence that is hard to access, the burden of proof shifts to the most affected residents. Within a justice framework, this situation violates the principle of procedural equality, as participation requires adequate understanding. It is important for every individual in an organization or society to understand the principles of behavior that support such justice (Darmawan, 2013). Explanations regarding waste placement in lower-class settlements must include this dimension, as decisions that appear administratively valid can remain morally problematic if procedures lock citizens out of the decision-making space.

Spatial planning is a vital arena that links economic growth with the distribution of ecological risk. When industrial designations and residential areas are placed close to each other without adequate separation, the boundary between production space and living space becomes blurred (Curran, 2018). In fact, the existence of green open spaces such as urban forests is crucial for maintaining air quality and the residential environment (Dahar et al., 2022). Decisions regarding buffer areas, transportation routes, and the location of processing facilities determine the direction of exposure that residents will experience. In many cases, low-income areas occupy spaces deemed less suitable for middle-class housing investment, so the addition of risky facilities does not trigger strong political resistance. Even for indigenous peoples living in urban areas, maintaining living spaces and traditions amidst modernity becomes a very heavy challenge (Amri & Khayru, 2022). From a policy ethics perspective, spatial planning should be an instrument of prevention, not an instrument for shifting burdens to specific groups. Therefore, the discussion needs to evaluate how environmental feasibility standards are applied, whether they are consistent, and whether the same protection is provided to all citizens regardless of socio-economic status.

Distributive justice pertains to how the benefits and risks of development are proportionally shared among social groups. In the relationship between industry and settlements, economic benefits are often articulated through job creation, regional income growth, and the availability of consumer goods (Wallimann-Helmer, 2018). However, John Rawls' theory of *justice as fairness* asserts that the distribution of social advantages can only be considered just if it also protects the least

advantaged groups (Rawls, 1971). Amidst economic uncertainty, organizations and governments must be more flexible in managing risks so as not to harm the wider community (Arifin & Darmawan, 2022). When pollution risks are concentrated in specific areas while benefits are enjoyed broadly, a moral imbalance occurs within the development structure.

The environmental justice approach adds that ecological risks should not be treated as an inevitable consequence of economic growth (Schlosberg, 2007). If industrial benefits are claimed as a matter of public interest, then responsibility for environmental impacts should also be a collective responsibility through prevention, compensation, and public health protection. One concrete step that can be taken is to involve the community directly in maintaining environmental cleanliness through waste bank programs (Djaelani, 2022). Thus, the issue of risk distribution is not merely a technical issue of waste management, but a normative question regarding who is deemed fit to bear hazards for the sake of the economic comfort of other groups.

Procedural justice highlights the quality of the decision-making process. A fair process requires access to information, opportunities to voice objections, and evaluation mechanisms that truly function. Regarding waste issues, procedures often feature public consultations, yet residents may experience these as belated meetings, documents that are difficult to read, and decisions that have already been finalized (Bell & Carrick, 2017). When procedures appear to be running, institutions can claim legitimacy, even if the quality of deliberation is low. This discussion shows that injustice is not always a violation of rules, but can be the use of rules to produce inequitable outcomes. Within a normative framework, fair procedures also need to account for differences in capacity, such as the ability to understand documents, transport costs, and free time. Sustainable policies should be able to adapt to social changes to remain relevant and fair for all levels of society (Halizah & Mardikaningsih, 2022). If a procedure presupposes capacities only possessed by advantaged groups, then that procedure is morally flawed because it maintains systematic exclusion.

Justice of recognition relates to how institutions view citizens living near waste facilities. When citizens are treated as objects that must adapt, the recognition of their dignity is weakened (AntadzeNino, 2015). Neglect can appear subtle, such as portraying complaints as irrational fears or

reducing citizen experiences to mere aesthetic issues. In this state, citizens lose their status as a legitimate source of knowledge regarding environmental conditions. In fact, lived experience provides early indicators of changes taking place, such as shifts in odor, irritation, or sleep disturbances. Good service quality significantly influences public satisfaction, especially regarding public health which touches daily life (Khayru & Issalillah, 2022). Recognition demands that such experiences be treated as input equal to technical reports. From this, it can be understood why waste burdens tend to stick to marginal groups, as they are often not recognized as political subjects with moral authority. Normative discussion affirms that recognition is not an ethical add-on, but a fundamental requirement so that public decisions do not build a hierarchy of human value.

Economic mechanisms drive the externalization of costs, which is the shifting of costs arising from production onto other parties. Waste is a tangible form of costs that seek to be suppressed. When full processing costs are deemed to reduce profits, incentives arise to find disposal or processing locations that are the cheapest and offer the least resistance (Ntiwane & Coetzee, 2018). Lower-class residential areas, due to various limitations, are often seen as meeting those criteria. Rapid urban growth often brings major challenges in maintaining social harmony and the equal distribution of facilities (Mardikaningsih, 2021). Externalization is not just an individual act, but a pattern that can be institutionalized through loose policies, weak oversight, and lack of clarity in responsibility. In normative discussion, externalization creates problems because it separates the actor from the consequences, causing moral responsibility to evaporate. Explanations regarding waste placement must link economic incentives with institutional design, as incentives will always seek loopholes when institutions do not close the space for abuse.

The legal and regulatory dimensions determine whether environmental protection becomes effective or remains an administrative ritual (Schuppert & Wallimann-Helmer, 2014). Rules may appear complete, but if enforcement is weak, they do not change behavior. Furthermore, rules that rely on technical thresholds without considering cumulative exposure can obscure the actual burden in densely populated settlements. The welfare of staff or field officers is also a critical key to

ensuring that the performance of public organizations in serving the community remains optimal (Gautama et al., 2021). Residents living near multiple sources of disturbance face a combination of pressures that are not reflected in fragmented evaluations. At a normative level, protection must view citizens as rights-holders that cannot be diminished by reasons of efficiency. This demands consistency between protection goals and enforcement tools, including transparency, accountability, and the certainty of sanctions. This discussion affirms that law is not merely text, but an institutional practice. When practice favors powerful actors, the placement of waste in marginal areas becomes a pattern that is difficult to break because the law does not function as a public safeguard.

Information inequality takes two mutually reinforcing forms. First, inequality of access, namely the difference in the ability to obtain documents, understand terminology, and follow processes. Second, inequality in the production of knowledge, specifically who can frame the official narrative regarding risk (Corburn, 2003). Industry possesses the resources to compile reports, present experts, and manage communication. Changes in community behavior toward a more environmentally friendly direction, such as starting to abandon single-use plastics, require a clear understanding of information (Hariani & Al Hakim, 2022). Residents often rely on sensory experiences and local knowledge, which are frequently viewed as less legitimate. In this condition, public discussion easily shifts into a competition of credibility rather than an examination of substance. When credibility is determined by technical capability alone, citizens are marginalized (Frickel et al., 2010). Normatively, equality demands that the state provide a knowledge bridge, such as document translation, the provision of independent explanations, and non-intimidating spaces for dialogue. Without such bridges, the placement of waste in lower-class areas can proceed through processes that appear participatory but actually block residents' access to necessary understanding.

Stigma toward waste-receiving areas reinforces the reproduction of environmental injustice through social and symbolic mechanisms (Schweitzer & Kim, 2009). When a region is labeled as a slum or dangerous, the social and economic value of that area declines, attracting less public and private investment. Goffman (1963) explains stigma as a social process that attaches a negative identity to individuals or groups,

thereby affecting the social treatment they receive. In the context of urban space, territorial stigma shapes policy perceptions that the area is less worthy of development priority. In fact, every region has valuable economic potential, including from the plantation sector which can be developed for the future (Darmawan et al., 2021). This process creates a cycle of self-fulfilling prophecy where limited public services are then used as evidence that the area is indeed problematic (Banerjee, 2013). Wacquant (2008) shows that territorial stigmatization can produce structural marginalization that deepens social and spatial inequality. When symbolic stigma is translated into the actual distribution of environmental risk, the injustice of recognition turns into material injustice. Therefore, rejecting territorial stigma means affirming the principle of ecological equality that every community has the same right to a healthy environment, policy protection, and equal social dignity.

The disproportionate health burden can be understood through the concept of recurring exposure and limited recovery. Marginalized groups often have restricted access to quality healthcare services, rest time, and nutrition that supports recovery (Martuzzi et al., 2010). When environmental exposure occurs continuously, the body's and the family's ability to recover diminishes. This is crucial considering that basic health standards, such as safe drinking water quality, are absolute requirements for a healthy life (Issalillah et al., 2022). Furthermore, the health burden also encompasses emotional weight, such as anxiety regarding children, household tension due to costs, and persistent fear. In normative discussion, health must not be reduced to the absence of disease, but rather a condition that enables citizens to lead a dignified life. If environmental policy permits exposure to a specific group, then that policy interferes with the basic ability of citizens to live as equals. The placement of waste in lower-class settlements, therefore, is not merely a technical issue, but a fundamental rights issue that demands strong moral justification, which is generally difficult to fulfill when risks are concentrated on the weakest.

Work relations and economic dependence on industry can create social ambivalence (Martuzzi et al., 2010). Citizens may view industry as both a source of income and a source of disturbance. This ambivalence is often exploited in public discourse, as if citizen objections were identical to a

rejection of employment. In reality, objections often stem from reasonable demands for protection, not from a rejection of economic activity. At a normative level, good policy must be able to avoid "choice extortion" a condition where citizens are forced to choose between work and health. In such high-pressure situations, social support from those around them is vital to reducing the anxiety and mental burden experienced by residents (Issalillah & Khayru, 2022). Choice extortion indicates institutional failure, as the state should ensure that economic activities do not sacrifice fundamental rights. By understanding this ambivalence, the explanation regarding waste placement becomes sharper. What is at issue is not the existence of industry alone, but the planning and oversight that allow the residual burden to cling to groups with low bargaining power.

The capacity of community organizations influences how environmental injustice is addressed, yet that capacity itself is often affected by daily burdens (Cartier et al., 2009). Citizens who work long hours, care for families, and face transportation constraints have limited space for consolidation. Furthermore, internal conflicts can arise when some residents work in the industry in question, or when social assistance is linked to an attitude toward a specific project. This situation can weaken the community's bargaining position, allowing the placement of waste facilities to proceed with minimal resistance. Normatively, such conditions demonstrate the importance of institutional protections that do not rely solely on the courage of citizens. Especially for vulnerable groups, heavy life burdens and unsupportive environments are often the primary causes of prolonged stress (Issalillah & Aisyah, 2022). If environmental protection depends on a community's ability to fight, then that protection systematically favors those who are already strong. Thus, the social mechanisms driving waste placement must be seen as a combination of policy design, economic dependency, and the limited collective capacity produced by inequality itself.

Risk assessment is often presented as an objective procedure, yet choices about what is counted and what is ignored carry normative weight (Porto & Finamore, 2012). For example, separating assessments by emission source can ignore the accumulation of exposure in densely populated areas. Prioritizing averages can obscure groups experiencing the highest exposure. Assessing risk without considering socio-economic

vulnerability can produce standards that appear equal but are inequitable. In normative discussion, objectivity does not mean value-free, but rather an openness regarding assumptions and a commitment to human protection. Therefore, the mechanism of placing waste in lower-class settlements can be understood as the result of assessment tools that are insensitive to inequality. When these tools are institutionalized, decisions will repeat in similar patterns because the assessment framework has locked in a specific way of seeing the problem. Correction requires the recognition that risk assessment is always linked to the question of who deserves to be protected first.

Corporate responsibility in waste issues is linked to production ethics and transparency (Pellow et al., 2001). Companies may claim compliance through formal fulfillment, yet ethics demand attention to the actual consequences for surrounding residents. Moral obligations encompass prevention, precaution, and openness to public oversight. If a company relies on trade secrets to withhold vital information, citizens lose the opportunity to protect themselves. At a normative level, transparency is not merely a virtue, but a prerequisite for a fair relationship between economic actors and society. The placement of waste in lower-class residential areas often occurs when companies view these communities as parties that are easy to manage, easy to provide with small compensation, or easy to ignore. This understanding must be challenged by the principle that every community possesses equal dignity; thus, corporate behavioral standards must be the same in every region, rather than adjusting to local bargaining power.

State responsibility transcends the licensing function, as the state is the guardian of citizens' rights (Schuppert & Wallimann-Helmer, 2014). When the state facilitates investment, it remains obligated to ensure environmental and health protection. State failure can occur through negligence, conflicts of interest, or prioritizing economic goals over public safety. In normative discussion, the state cannot hide behind the claim that citizens can move if they are uncomfortable, because the ability to move is a privilege. The state also cannot assume that formal compliance is sufficient if that compliance does not reduce the actual burden on the community. Social mechanisms that drive waste placement in lower-class areas often involve an imbalance in state attention, where influential regions receive swift protection while marginal areas wait a long time. The

principle of citizen equality demands that protection be influenced not by social status, but by need and level of vulnerability.

The relationship between ecological inequality and social inequality demonstrates that the two are mutually reinforcing (Schweitzer & Kim, 2009). When poor regions receive waste burdens, the quality of life drops and economic opportunities are hindered, allowing poverty to persist. At the same time, poverty makes citizens less able to resist the placement of new facilities. This cycle shows that environmental policy has implications for the distribution of welfare. Normatively, public policy should break the cycle of inequality rather than sustain it. Therefore, the explanation regarding waste placement needs to frame this issue as a matter of social justice taking an ecological form. If burdens are repeatedly placed on marginalized groups, then policy has treated them as a tool for the comfort of other groups. Moral equality rejects such treatment. Consequently, the answer to the research problem demands a synthesis of arguments regarding the political economy of space, procedural design, and the recognition of citizens' dignity.

The intergenerational dimension is important because waste and pollution can leave long-lasting traces on the environment, while political decisions are often short-term. Children growing up in burden-receiving areas may face restrictions on activities, a decreased sense of security, and learning obstacles due to environmental disturbances. Families then bear additional burdens to protect children, such as limiting play spaces or seeking healthcare (Pearce et al., 2010). At a normative level, intergenerational injustice occurs when current generations shift risks to generations that cannot yet voice their interests. The placement of waste in lower-class settlements often contains this element because the residents' ability to avoid it is limited, while the consequences can persist. The precautionary principle demands that decisions consider the possibility of long-term losses, especially for the most vulnerable groups (Sze & London, 2008). By including this dimension, the explanation becomes more complete regarding why waste placement is a matter of justice that transcends current cost calculations.

The ethics of risk distribution demand criteria that can be morally justified (AntadzeNino, 2015). These criteria may include equality of protection, priority for the most vulnerable, and a prohibition against

turning specific groups into a buffer for the comfort of others. If a policy repeatedly places industrial residues in lower-class areas, that policy must be tested with the question: is there sufficient moral reason to place the risk upon them. In many ethical frameworks, imposing risks on parties who do not receive proportional benefits is an action that is difficult to justify. Normative discussion emphasizes that consent is a crucial requirement, yet consent must be free and informed. When citizens consent because they have no other choice, that consent loses its moral meaning. Therefore, the social mechanisms driving waste placement can operate through the production of "pseudo-consent," which is an acceptance born out of economic necessity and information inequality.

In the relationship between the center and the periphery, there is a tendency to shift burdens from regions with political power to those that are less heard (Nakazawa, 2016). This can occur through a network of dispersed decisions, ranging from zoning designations to the selection of waste transport routes. Peripheral residents often experience decisions as something coming from the outside, while their ability to influence those decisions is limited. Normatively, decentralization does not automatically produce justice if local capacity is weak and power relations remain skewed. Explanations regarding waste placement need to examine how the scale of government affects accountability for instance, who can be held responsible when disturbances occur. If responsibility is dispersed without a clear center, residents will find it difficult to seek redress. Thus, social mechanisms include institutional architectures that can produce a vacuum of responsibility, which ultimately facilitates the placement of burdens on marginal settlements.

This discussion affirms that the placement of industrial waste in lower-class settlements is the result of an intersection of several mutually reinforcing mechanisms. The commodification of space, externalization of costs, information inequality, exclusive procedures, and the weak recognition of citizens form a path that concentrates the burden. Beyond that, territorial stigma and economic dependence narrow the space for resistance. The answer to the research problem, therefore, does not point to a single cause, but to a configuration of causes that persist because they are considered normal. It is this normalization that must be challenged normatively. When a burden becomes a habit, injustice turns into administrative routine. The discussion also reinforces that this issue must

be understood as a matter of citizenship, as it concerns the right to a decent environment, the right to information, and the right to be protected without discrimination. Within that framework, ecological inequality appears as a form of inequality manifested in the space and bodies of the citizens.

Conclusion

Ecological inequality and the waste burden on marginalized communities occur through social mechanisms structured by spatial decisions, governance design, and power relations that differentiate bargaining power between groups. Industrial waste, as a production residue, tends to be directed toward lower-class residential areas when space is treated as a commodity, environmental costs are externalized, and decision-making procedures limit citizen access to information and meaningful participation. Injustice becomes evident through the concentration of risk in communities with limited housing options, restricted advocacy capacity, and experiences that are often not recognized as legitimate knowledge. Within a normative framework, this situation violates distributive, procedural, and recognitional justice, and gives rise to an imbalanced health burden. Therefore, the issue of waste placement is not merely a technical issue, but an issue of fundamental rights and public policy ethics that demands strict moral justification.

The implications and suggestions are directed toward strengthening the principles of equality of protection, transparency, and accountability in decisions related to industrial waste and spatial planning. The normative framework developed in this writing suggests that policies prioritize the protection of vulnerable groups through participation procedures that are truly accessible, including the provision of information understandable to citizens, effective spaces for objection, and the affirmation of responsibility when disturbances occur. Risk assessment needs to incorporate socio-economic vulnerability and the possibility of accumulated exposure, so that safety standards do not obscure the burden on dense and poor settlements. Furthermore, decision-making needs to avoid the production of pseudo-consent born from necessity, by ensuring that citizens' choices are not extorted by economic dependence. Suggestions for further research include expanding the development of the environmental justice concept to assess

the consistency of protection across regions and formulating normative measures regarding the fairness of risk distribution.

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