

## Evaluating the Impact of Environmental Management Policies on Communities in the Leather Tannery Industrial Area of Garut Regency

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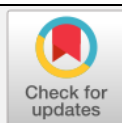
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### ABSTRACT

Industrialization fundamentally aims to enhance the quality of life and the welfare of people. However, insufficient management of residual production waste generates adverse effects on both the environment and the inhabitants residing near industrial zones. In response, the government has established regulatory measures for environmental protection and management through Government Regulation Number 22 of 2021. This regulation seeks to strike a balance between the community's economic interests and environmental sustainability, safeguarding the rights of citizens. The core objectives of this research are to assess the state of environmental policies within the Sukaregang leather tanning industrial area, to scrutinize the implementation of environmental management practices, and to evaluate the impact of Government Regulation Number 22 of 2021. Employing a qualitative case study approach, the research centers on the Sukaregang leather tanning industrial area, a pivotal hub for the leather industry and a symbol of the Garut Regency. The data collection involves interviews with key stakeholders, including the Environmental Service, the leather tanning industry, and the affected community. The research concludes that while policies based on Government Regulation Number 22 of 2021 are in place, complementary local regulations are absent. The current implementation of

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*environmental management continues to engender negative externalities in sectors such as agriculture, health, and environmental pollution. To address the shortfalls in achieving policy goals and objectives, it becomes imperative to establish local regulations that facilitate cost-sharing in the waste treatment process, utilizing Wastewater Treatment Plant (WWTP) technology. Such measures are essential for upholding environmental quality for the residents of industrial areas.*

**Keywords:** *Environmental Policies; Industrialization; Leather Tanning Industry; Residual Production Waste*

## 1. Introduction

Human life is intricately intertwined with the environment, encompassing both the natural and social aspects. Humans play positive and negative roles in this environment (Adiwijaya & Pisi, 2020). Industrialization, while aiming to enhance the quality of life and well-being, is closely linked to improving human resources and utilizing natural resources (Maghfiro et al., 2017). The industrial sector is a primary catalyst for national economic growth, ensuring economic resilience by bolstering regional economic potential (Azis & Julia, 2022). The development of industries, including the leather tanning sector, spans across Indonesia, with a notable presence in the Sukaregang Garut Tannery Industry Center—the nation's largest hub for leather tanning (Dzikron et al., 2016). Several families have nurtured this industry for generations, dating back to the 1920s and continuing into the present (Badan Perencanaan Pembangunan Daerah Provinsi Jawa Barat, 2015). A 2019 survey conducted by the Garut Regency Industry, Trade, and Market Processing Office reported 387 leather tanning establishments, consuming 18,762 tons of raw materials and generating a total output of approximately 29,312,841. The Sukaregang leather industry center enjoys widespread recognition and distributes its products to nearly every corner of Indonesia and is exported to Australia, Singapore, Malaysia, and China (Sukoco & Muhyi, 2015). The industry's positive externalities contribute to regional income by providing substantial employment opportunities and foreign exchange earnings through exports.

However, within the operational processes of the leather tanning industry—a sector classified as hazardous—various types of waste are produced, encompassing liquids, solids, and gases (Suparno et al., 2008). Of particular concern are pollutants, including Chromium (Cr) compounds, which fall under the Hazardous and Toxic Substances waste category, as defined in Attachment IX to Government Regulation Number 22 of 2021 (Republik Indonesia, 2021). The expansion of the leather industry and lax enforcement of waste-related regulations have led to negative externalities manifested in environmental pollution (Sugihartono et al., 2015) as stipulated in Article 22 of Law Number 11 of 2020, which amends Article 1 (14) of Law of the Republic of Indonesia Number 32 of 2009, environmental pollution results from human activities introducing living organisms, substances, energy, and other components into the environment (Republik Indonesia, 2009, 2020). This alteration disrupts the environment's intended functionality, rendering it less effective (Palar, 2012). Human activities significantly

contribute to environmental pollution as they utilize the environment's resources for diverse production endeavors to meet life's necessities (Suyasa, 2015).

The leather industry's waste production aligns with observable phenomena. A stroll through the Sukaregang area unveils polluted rivers and a pervasive stench that mars the aesthetics. Water pollution, particularly within the Sukaregang Leather Tannery Industry vicinity—encompassing the Ciwalen River and Cigulampeng River—has been established. Laboratory tests conducted by the Garut Regency Environmental Service reveal that the river water quality fails to meet the standards outlined in Appendix VI of Government Regulation Number 22 of 2021 (Republik Indonesia, 2021), as seen in Table 1.

**Table 1. Water Quality Test Results of Cigulampeng River in 2019**

Laboratory Test Results Report Water Quality of Cigulampeng River 2019			
Test Results	BOD	COD	Cr6+
Parameter	(mg/L)	(mg/L)	(mg/L)
Monitoring Period (2019)			
March	72.3	187.5	0.151
April	57.1	160	<0.05
May	97	284	0.324
June	104	26.2	0.214
Maximum Allowable Quality Standard for Class II River	3	25	0.6

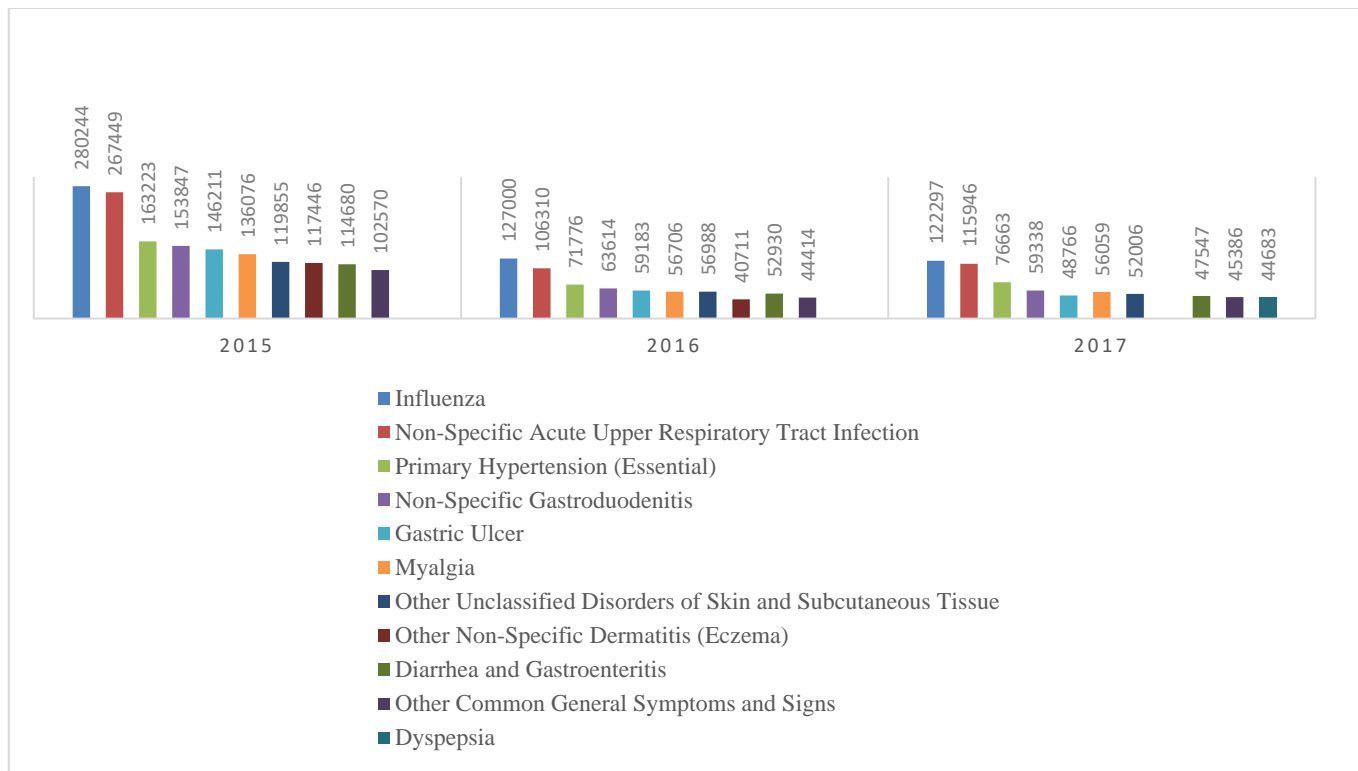
Source: Laboratory Test Results, Garut Regency Environmental Service (2022)

Table 1 displays the outcomes of water quality assessments conducted on the Cigulampeng River in 2019. The parameters evaluated encompass Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Chromium VI (Cr6+). The measurements are expressed in milligrams per liter (mg/L), covering the monitoring period of March, April, May, and June. Moreover, the table incorporates the upper permissible quality benchmarks for rivers classified as Class II.

The declining quality of river water resulting from sewage and garbage potentially jeopardizes clean water supplies and aquatic ecosystem health, thereby leading to a degradation in environmental quality. This could adversely disrupt people's lives, particularly in surrounding river basins (Fatmawati et al., 2016; Tian et al., 2019). The contamination of rivers near leather industry zones has incited unrest and impacted the local population residing in these tannery areas. Demonstrations are tangible proof of the residents' discontent, occurring almost annually. In 2018, protests were accompanied by the dumping of tons of waste and the discharge of wastewater onto the streets. In 2019, residents engaged in roadblocks using benches, wood, and other protests (Fakta & Realita, 2020). In 2020, resident frustration was vented by redirecting wastewater from the river onto the streets and staging roadblock protests that temporarily halted vehicular traffic (Warta Satu, 2020). Environmental issues appear to escalate with the intensification of industrial growth, even though industrialization remains a developmental priority.

The adverse consequences stemming from the deterioration of environmental quality due to pollution or natural resource degradation manifest as health threats, decreased aesthetic value,

economic losses (in terms of economic costs), and disruptions to natural systems (Rahmadi, 2011). Drawing from data from BPS - Statistics Indonesia of Garut Regency as of 2017, a distinct correlation emerges between the ten most prevalent diseases over three consecutive years (2015-2017) - including respiratory infections, skin disorders, dermatitis, and diarrhea - and environmental pollution.



**Figure 1. The Top 10 Disease Cases in Garut Regency from 2015 to 2017**

Source: [Badan Pusat Statistik Kabupaten Garut \(2022\)](#)

Given the prevailing social and environmental challenges within the Leather Tannery Industrial Area of Garut Regency, this research focuses on exploring the extent of policy achievements and their implications, particularly for the residents of the affected Sukaregang region. The analysis is centered on addressing the following problem formulations: (1) How is the environmental policy in the Leather Tannery Industrial area; (2) How is the environmental management in the Sukaregang Leather Tannery Industrial area; and (3) How to evaluate the impact of the policy of Government Regulation of the Republic of Indonesia Number 22 of 2021 concerning Environmental Protection and Management (Republik Indonesia, 2021). Evaluation is undertaken because not all public policy initiatives attain their intended outcomes, and objectives may remain unmet. Consequently, policy evaluation seeks to unearth the factors contributing to policy failures or to ascertain whether the executed public policies have yielded the desired impact.

## 2. Literature Review

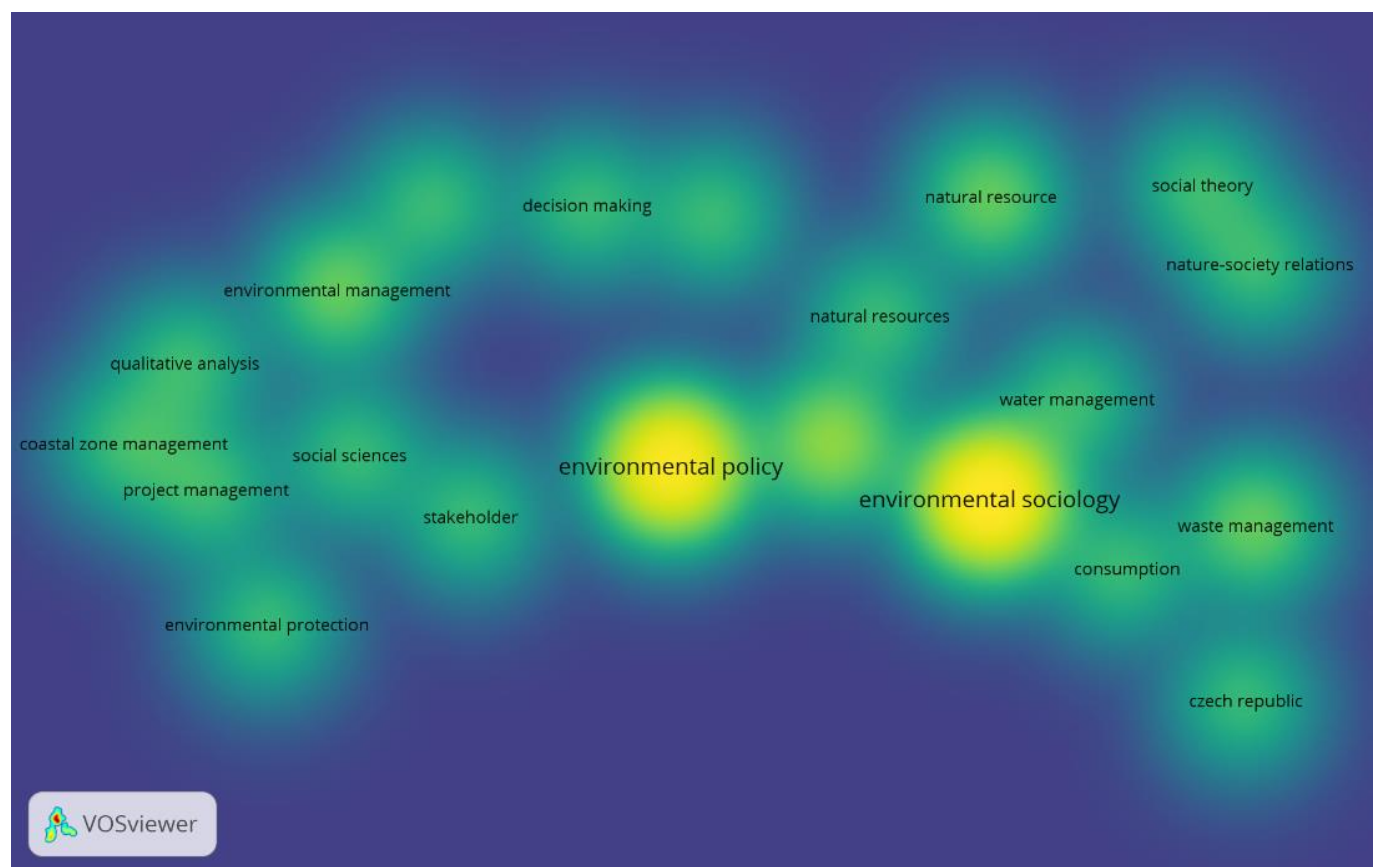
The research concept explored in this study is closely intertwined with environmental sociology, which delves into the relationship between environmental aspects and human behavior. Environmental sociology examines the human-driven use of natural resources and the causes of environmental pollution and degradation due to various human activities



(Adiwijaya & Pisi, 2020). This field revolves around two primary areas: understanding human-nature interactions and uncovering the societal origins of environmental issues, their social ramifications, and the strategies employed to address them (Catton & Dunlap, as cited in Biju, 2014).

Within the research analysis of this study, the focus lies on environmental management theory and policy impact evaluation. This connection with human society, an essential facet of environmental sociology, is central to the policy's intended success. The evaluation of how environmental management policies influence society, combined with the concepts from environmental sociology, remains an underexplored area. This novelty is especially pronounced in the leather tanning industry, where such research is scant.

As of May 27, 2023, a search conducted in Scopus indexed journals using keywords ("policy" AND "management" AND "environmental sociology") AND (LIMIT-TO (DOCTYPE, "ar")) yielded only 19 articles (Buckingham & Jepson, 2015; Carolan, 2006; Cooke et al., 2021; Davis & Jones, 2014; Heemskerk et al., 2015; Kada, 2006; Mabon et al., 2020; MacKendrick & Davidson, 2007; Martins, 2013; Neilson & São Marcos, 2019; Nye & Hargreaves, 2010; Qin et al., 2018; Ragusa, 2021; Rudestam et al., 2018; Schürkmann, 2021; Spaargaren, 2003; Vail, 2007, 2009; Westberg & Powell, 2015). Interestingly, none of these articles specifically delve into the impact of environmental management policies on society or examine them from the perspective of environmental sociology. The keyword density visualization using VOSviewer (Figure 2) demonstrates that discussions related to policy evaluation and environmental management remain scarce, indicating the potential for this study to contribute novelty to the field.



**Figure 2. Visualizing Density in Scopus Indexed Journals Using VOSviewer**

## 2.1. Environmental Management

Environmental protection and management, as defined in Article 1 (2) of Government Regulation of the Republic of Indonesia Number 22 of 2021, encompass a comprehensive and systematic endeavor to safeguard environmental functions and mitigate pollution and environmental degradation (Republik Indonesia, 2021). This multifaceted approach includes planning, utilization, control, maintenance, supervision, and law enforcement. In the execution of environmental management within a specific area, the process revolves around four POAC indicators (Asdak, 2018):

- 1) Planning: This initial step involves integrated planning that produces policy documents with well-defined objectives to address public issues effectively.
- 2) Organizing: This stage involves delegating authority and overseeing activities to ensure coordination and commitment among stakeholders engaged in environmental management.
- 3) Actuating: This phase entails implementing programs and policies aligned with the established plan to attain the goals and objectives.
- 4) Controlling: This aspect encompasses monitoring activities to ensure alignment between the initial planning and the subsequent activities. This monitoring provides feedback critical for informing future planning.

These stages collectively guide the environmental management process, enabling a structured and cohesive approach to preserving the environment while tackling challenges posed by pollution and damage.

## 2.2. Policy Impact Assessment

Public policy refers to a sequence of activities executed by a collective of individuals responding to issues that concern or confront the public (James Anderson, as cited in Meutia, 2017). Within the public policy process, policy evaluation emerges as a pivotal component to ascertain the realization of program or policy objectives (Akbar & Mohi, 2018). This evaluation process furnishes valuable descriptions and information, providing a foundation for making informed alternative decisions (Sufflebeam as cited in Arikunto, 2019). In simpler terms, policy evaluation aims to discern the intended outcomes of a policy, the means to achieve them, and the extent to which predetermined objectives (both impact and policy relationships) have been attained. Methods employed to assess impact often encompass a qualitative and evaluative approach, assessing policy success or shortcomings (Akbar & Mohi, 2018).

## 3. Research Methodology

This research centers on investigating the societal and environmental dimensions concerning the assessment of the ramifications of environmental management policies on the inhabitants of the Sukaregang area. Thus, it is most suitable to adopt qualitative methods, employing a case study approach (Creswell, 2018). Data collection will involve conducting on-site field studies within the Sukaregang locality and purposive sampling interviews involving key stakeholders, including representatives from the Environment Agency, the industrial sector, and the local community. This approach will provide insights from those affected by the presence of the industry.

To ensure the research's validity, source triangulation techniques will be applied. This involves engaging in interviews with informants holding diverse tasks, functions, and positions, thereby enhancing the robustness of the data. Furthermore, various methods will be

employed to cross-verify information, including observation, interviews, and the utilization of collected data (Moleong, 2017). The culmination of this process will involve drawing conclusions and verifying them by assessing the coherence and accuracy of the obtained data. Following the analysis of environmental management, the research will proceed to identify findings and offer recommendations for evaluating the influence of environmental management policies on the community within the Leather Tannery Industrial Area of Garut Regency.

## **4. Results and Discussion**

### **4.1. Policy for the Sukaregang Leather Tannery Industry**

The Sukaregang Garut Tannery Industry Center is Indonesia's largest leather tanning hub (Dzikron et al., 2016). Under the Regent of Garut's 2001 Decree, the leather industrial zone encompasses roughly 80 hectares (Rachmat et al., 2009). Leather craftsmanship is a distinctive Garut product emblematic of the region. The presence of this leather industry yields a favorable externality – the leather tanning center – bolstering the livelihoods of many Garut residents and contributing significantly to regional income. Data from the "Garut Regency in Figures for 2021" report by BPS - Statistics Indonesia of Garut Regency indicates that the manufacturing sector constitutes approximately 8.17% of the Garut Regency's GRDP, equivalent to IDR3367.92 billion. This places the processing industry third after the agriculture, forestry, fishery sectors, and wholesale and retail trade. The processing industry in Garut Regency encompasses various sectors, including agro and forest product industries, textiles and leather, metal minerals, and chemical industries (Badan Pusat Statistik Kabupaten Garut, 2022).

As per the 1945 Constitution, Article 33, paragraph 3, land, water, and natural resources are under state control for the greatest welfare of the people (Republik Indonesia, 2002). However, the Sukaregang Leather Tannery Industrial Area grapples with significant environmental issues, particularly the compromised quality of its river water. Environmental problems span technological, industrial, ecological, and biological spheres, including pollution control, prevention, and social problems (Adiwibowo, 2007). The interactions between the environment and the Sukaregang community contribute to environmental issues and adversely affect the local populace, necessitating concerted efforts for resolution. In line with environmental sociology discussions, according to Dunlop and Catton, as cited in Adiwijaya & Pisi (2020), this corresponds to challenges that demand solutions to prevent environmental crises. Within this context, the human-nature relationship in the Sukaregang area – characterized by the use of river water for leather tanning and the disposal of waste products into the river – reveals a problematic interaction. This implies that the river, a natural resource, is merely treated as a means for production or consumption, reflecting a lack of environmental consciousness.

This human-nature interplay in the Sukaregang area results in environmental degradation, including declining water, air, and soil quality, thereby impacting farming. These resource limitations additionally give rise to social problems, such as compromised health quality, skin ailments, and respiratory infections. Addressing these challenges related to the focal points of environmental sociology requires dedicated efforts. Consequently, measures to combat environmental pollution and ensure sustainability are crucial for resource longevity. To this end, the Government of Indonesia has introduced Government Regulation Number 22 of 2021, focusing on Environmental Protection and Management, aimed at harmonizing economic interests for citizens' welfare and environmental sustainability – an inherent right of the citizens (Republik Indonesia, 2021). The regulation specifies that industrial players responsible for waste production must manage Hazardous and Non-Hazardous waste. The waste management process is further outlined in Regulation of the Minister of Environment and Forestry of the

Republic of Indonesia Number 6 of 2021 concerning Procedures and Requirements for B3 Waste Management. Policies about the Leather Tannery Industry also adhere to regulations dictating that wastewater quality must comply with standards detailed in Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.21/MENLHK/SETJEN/KUM.1/7/2018, amending the Minister of Environment Regulation Number 5 of 2014 regarding Wastewater Quality Standards for Leather Tannery Businesses and/or Industrial Activities (Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia, 2018, 2021). However, the Garut Regency Government has yet to establish local regulations specifically governing environmental management policies within the Sukaregang Leather Tannery Industrial area. Insights gleaned from interviews with the Environmental Service reveal that their execution of regulatory responsibilities in the environmental sector adheres to central government guidelines.

## **4.2. Environmental Management**

Environmental management strives to harmonize economic interests with sustainable development for both the environment and the well-being of the Sukaregang Leather Tannery Industry area residents. The policy's execution involves actors from the Environmental Service who convey its tenets to those responsible for generating waste. The research analysis focuses on three out of the four indicators, as follows:

### **4.2.1. Planning**

Planning is an essential facet of environmental management, involving forecasting uncertain circumstances and devising actions for the future. This aims to formulate public policies capable of resolving societal issues. Public policy, as defined by Dye (2017), refers to "whatever governments choose to do or not to do," encompassing the government's choices regarding action or inaction. To address pollution in Sukaregang, the Garut Regency regional government faces the choice of either closing the industry or permitting its operations. The leather industry generates waste with the potential to pollute the environment. Situated in a densely populated region, the industrial area is intersected by the Cigulampeng and Ciwalen rivers, integral to the daily lives of the Sukaregang populace.

The tanning process relies heavily on chemicals and water, resulting in substantial waste laden with chemical pollutants that can pollute the environment (Suparno et al., 2008). Cr+6, chromium VI, or hexavalent chromium, a primary chemical utilized in tanning, confers durability and resistance to physical, chemical, and microbial factors (Suryaningtyas & Yuda, 2014). Given the hazards and environmental pollution linked to the leather tanning industry, those managing such businesses must possess environmental documents outlining management plans and assessing societal and environmental impacts. The government has established waste management rules and standards for wastewater quality, which industries must adhere to. Effective waste treatment requires the utilization of Wastewater Treatment Installation (WWTP) technology, which industries generating waste should possess. While the Garut Regency government offers three WWTPs for industry use, these facilities require repair. The operation of WWTPs involves substantial costs, including electricity, chemical mixing, and fuel, placing a burden on the industry. Nonetheless, it remains crucial for industrial players to manage residual production waste to ensure sustainable development and uphold social progress, thereby fostering equity for the community residing in the Leather Tannery Industrial area, which constitutes an integral part of the overall development.



#### 4.2.2. Organizing

Organizing means effectively and efficiently implementing the comprehensive environmental management agenda, encompassing cooperation between various groups or policy actors. This indicator necessitates determining respective authorities and responsibilities to ensure a cohesive pursuit of goals. It entails the involvement of policy actors and target groups, particularly the Government's Environmental Service, the Leather Tannery Industry responsible for waste generation, and the local Sukaregang community affected by these operations.

Implementing environmental management is underpinned by the commitment of officials and implementers, a pivotal aspect of the process. Government Regulation of the Republic of Indonesia Number 22 of 2021 concerning Environmental Protection and Management signifies a systematic, integrated effort to preserve environmental functions and counteract pollution and damage. This regulation covers multiple dimensions: planning, utilization, control, maintenance, supervision, and law enforcement ([Republik Indonesia, 2021](#)).

Elaborating on Article 29 (1) of Government Regulation of the Republic of Indonesia Number 22 of 2021, direct impacts on communities can be positive and negative. Favorable outcomes include job or business opportunities, while adverse effects encompass social conflicts or health issues. Community involvement in environmental management involves consultations when industries plan and establish operations with environmental impacts, as stipulated by Article 28 of Government Regulation of the Republic of Indonesia Number 22 of 2021 ([Republik Indonesia, 2021](#)). Interviews with residents neighboring the industry in Sukaregang revealed that they were neither invited to partake in drafting environmental agreements nor allowed to provide feedback. Despite well-established industries in Sukaregang, newer establishments seemed less inclined to extend invitations.

Observations by the Garut Regency Environmental Service have yielded data on the number of leather tanning industries possessing environmental permits. Such permits are mandated by Article 4 of Government Regulation of the Republic of Indonesia Number 22 of 2021, which stipulates that businesses and activities impacting the environment must acquire an Analysis of Environmental Impacts, Environmental Management Efforts, Environmental Monitoring Efforts, and/or Environmental Management Statement ([Republik Indonesia, 2021](#)). Industries' compliance with these obligations is limited, with only eight out of 387 tanning industries fulfilling its requirements. The Environmental Control and Management Division within the Garut Regency Environmental Service stated that the industry lacked awareness in submitting these permit documents.

Moreover, research findings underscore the absence of unwavering commitment from the implementing apparatus, alongside industries evading responsibility for producing environmental permit documents. Article 508 (1) of Chapter IX of Government Regulation of the Republic of Indonesia Number 22 of 2021 stipulates sanctions for entrepreneurs breaching environmental control and management policies. Only written warning letters have been issued to industries violating regulations, with punitive actions yet to progress beyond this stage. The imposition of sanctions for violations necessitates the local government's commitment, as the Garut Regency Environmental Service lacks the authority to enforce such measures.

Environmental management within this context functions to delineate responsibilities and facilitate coordination. Interests and coordination extend beyond human resources (government, industry, and society) to encompass environmental factors in Sukaregang, particularly those associated with the local rivers.

#### 4.2.3. Actuating

Actuating in environmental management denotes its implementation to mitigate environmental pollution. The Environmental Service, as the implementing entity per Article 494 of Government Regulation of the Republic of Indonesia Number 22 of 2021, deputized by the Garut Regent according to the Garut Regency Regional Regulation Number 9 of 2016, assumes the responsibilities outlined in Chapter X, including industrial party guidance and supervision. Challenges in implementing environmental protection and management policies stem from the industry's limited commitment to waste management processes ([Pemerintah Kabupaten Garut, 2016](#); [Republik Indonesia, 2021](#)). The management of waste must be sustainable and contribute to citizen well-being ([Amri & Mayarni, 2019](#)). Failing to manage production waste sustainably, particularly in the context of the leather industry, can erode environmental quality (Purnaweni, 2014). The degraded state of the Cigulampeng River in the Sukaregang leather industrial area and its inability to meet basic human needs highlight the detrimental consequences of unsustainable industry operations. Rivers are vital water sources, sustaining life; however, the river's utility has diminished due to waste pollution. Additionally, the waste impacts the quality of community well water, with residents reporting odors. Therefore, water from the river requires filtration before use, even for washing.

This environmental pollution amplifies concerns among local farmers, who grapple with the pervasive impacts of leather waste on their livelihoods ([Balipuspanews.com, 2019](#)). Although the Sukaregang leather industry bolsters the regional industrial sector, it exacts an economic toll on farmers, compromising crop yields and causing crop failure. Integrating leather waste into irrigation water, leading to water pollution underscores farmers' predicament ([Kabarpriangan.com, 2019](#)). Industrial waste contributes to water pollution, affecting the health of residents and undermining public well-being. Interviews with Sukaregang residents highlight the adverse health effects of waste pollution, including skin disorders and respiratory issues – particularly distressing for individuals with asthma.

Despite efforts at implementing environmental management, the anticipated outcomes have yet to materialize, as negative externalities persist within the community. While industrial activities contribute to citizens' prosperity by catering to essential needs, their execution must align with natural conditions. Environmental challenges transcend mere concerns; they are integral to survival and well-being.

#### 4.3. Policy Impact Evaluation

Policy evaluation signifies that assessment should stem directly from policy actions rather than external factors. The essence of impact evaluation lies in discerning the extent to which policy objectives have been met, refining management processes, aligning inputs with plans, and uncovering implementation weaknesses.

Given the context of environmental sociology and the findings from the analysis of environmental management, it's evident that the policy goals for the Sukaregang Leather Tannery Industrial Area community have not been achieved. The industry continues to yield numerous negative externalities, encompassing environmental pollution in water bodies that can no longer optimally support livelihoods, air pollution from stagnant waste odors, agricultural losses—such as crop failures due to skin waste-contaminated irrigation—and health complications.

Policy objectives outlined in Government Regulation of the Republic of Indonesia Number 22 of 2021 strive to harmonize economic interests with citizen well-being and environmental sustainability, yet this harmony remains elusive ([Republik Indonesia, 2021](#)). The sustainability

of the environment, substantiated by Garut Regency Environmental Service laboratory tests and visible conditions in Sukaregang, has not been verified. However, the policy's economic objectives have been realized, as evidenced by the industry's position as the third-largest contributor to Garut Regency's GRDP. The Sukaregang leather industry has fostered employment opportunities, bolstering developmental progress in Garut. Nonetheless, this progress lacks sustainability, as outlined in Law of the Republic of Indonesia Number 11 of 2020, which defines sustainable development as a deliberate and planned endeavor that incorporates environmental, social, and economic dimensions into a comprehensive strategy, safeguarding the environment's integrity and the well-being of current and future generations (Republik Indonesia, 2020).

The components of Government Regulation of the Republic of Indonesia Number 22 of 2021 encompass planning, utilization, control, maintenance, supervision, and enforcement of environmental laws (Republik Indonesia, 2021). Successful implementation mandates synergy, cooperation, and coordination among actors and policy target groups. Despite the comprehensive inputs outlined in policy regulations, proper implementation has faltered, riddled with distortions in the field. Analyzing the projected impact of environmental protection and management policies suggests they may not notably mitigate environmental pollution. This is attributed to the large number of dispersed industries, individual awareness, environmental responsibility, and concerns for the well-being of inhabitants in industrial zones. These factors constitute significant weaknesses and barriers hindering the attainment of policy objectives. Financial resources pose another challenge, serving as the primary impediment to adopting WWTP (Wastewater Treatment Installation) technology for waste treatment.

Evaluation inherently serves as a means to facilitate enhancement for subsequent stages. A pivotal improvement entails refining environmental management processes, notably the treatment of waste residues to meet quality standards for wastewater. This step is vital in safeguarding rivers in industrial areas. While Government Regulation of the Republic of Indonesia Number 22 of 2021 comprehensively outlines responsibilities for waste generators (Republik Indonesia, 2021), the Garut Regency government needs to formulate supplementary or regional regulations. Such regulations can govern the allocation of costs for local government-operated WWTP technology. The high operational cost associated with waste treatment via WWTP is the core reason behind the industry's hesitancy to adopt the technology. To address this, industries lacking WWTP facilities could utilize local government-owned facilities, with the implementation of regional policies for cost-sharing proving a mutually beneficial solution. The collective endeavor to process waste and share expenses is envisaged to uphold environmental sustainability and foster sustainable industrialization. Naturally, the efficacy of these regulations requires the commitment of all stakeholders to ensure successful execution and the realization of envisioned outcomes.

## 5. Conclusion

The Garut Regency Government has taken steps to address the environmental sociology challenges in the Sukaregang area by enacting environmental protection and management measures based on Government Regulation of the Republic of Indonesia Number 22 of 2021, alongside other related derivative regulations. However, specific local regulations directly addressing environmental management are lacking within the jurisdiction. The environmental management within the Leather Tanning Industry of the Sukaregang Garut area is anchored in planning indicators rooted in environmental management. This approach transcends mere positive externalities for the local economy; it places significant emphasis on maintaining

environmental sustainability. Initiatives to curtail environmental pollution are delineated through regulations governing waste management, requisite quality standards, and the application of WWTP (Wastewater Treatment Plant) technology for processing.

The indicators tied to organizing signify commitment and shared responsibilities among stakeholders, fostering coordination. Yet, a notable absence of resolute actions from the local government in response to policy infringements by industrial entities remains apparent. Moreover, the implementation phase, actuating, remains beset with various aberrations that result in negative externalities for the residents of the Sukaregang Leather Tannery Industrial Area in the Garut Regency.

Although policy regulations are in place, the harmonious convergence of economic interests and environmental sustainability is still far from realized within the leather tanning industrial landscape of Garut Regency. The evaluation suggests formulating policy provisions concerning cost-sharing mechanisms for operating WWTPs under local government ownership as part of an ongoing refinement process. This approach would allow industries lacking WWTP technology to leverage local government facilities while contributing a stipulated levy.

By adopting such a strategy, the regulatory implementation within the leather tanning industrial sector could move closer to balancing economic aspirations and the imperative of environmental sustainability. This proposition for refining policy outcomes underscores the significance of collaborative efforts, where economic actors and local governance mutually uphold environmental integrity for the community's well-being and the surrounding ecosystem.

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## 7. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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