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ENVIRONMENTAL AWARENESS AND PRACTICES IN WASTE MANAGEMENT: A GREEN CRIMINOLOGICAL PERSPECTIVE

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Abstract:
This study investigated the Environmental injustice and waste management practices in Magsaysay, Mati City, Davao Oriental, focusing on three key dimensions: distribution, intergeneration, and procedures. Utilizing a quantitative research design, the research collected and analyzed data on respondents' perceptions regarding waste management methods, including incineration, wastewater disposal and landfilling. This study revealed the cooperation of 100 respondents from Magsaysay, Mati City, Davao Oriental, with the use of the quota sampling method, a non-probability sampling method that relies on the non-random selection of a predetermined number or proportion of units. The findings revealed a strong awareness of environmental awareness and practices, particularly among younger respondents aged 18 to 25. The demographic analysis indicated that marginalized communities disproportionately experience higher pollution levels and received inadequate waste management services compared to wealthier areas, underscoring systemic inequalities in environmental burdens. Respondents expressed strong support for incineration as an effective solution to reduce landfill waste and emphasized the critical need for proper wastewater disposal to safeguard public health and protect the environment. Additionally, the study found no significant differences in perceptions based on age, gender, ethnicity, or educational attainment, suggesting a shared understanding of these issues across diverse demographic groups. Overall, this research aims to raise awareness of environmental injustices in waste management and

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proposes strategies for enhancing community engagement and equitable policy development to address these pressing challenges effectively.

Keywords: environmental awareness and practices, waste management, criminological perspective, Mati, Davao Oriental

1. Introduction

1.1 Rationale of the Study

The rapid urbanization and population growth in many areas have led to significant challenges in waste management. Improper waste disposal practices contribute to environmental degradation, pollution, and health risks for communities. Compliance remains inconsistent despite implementing laws such as Republic Act 9003, which aims to improve solid waste management (SWM) in the Philippines. This highlights the urgent need for enhanced community awareness and effective waste management strategies to address these pressing environmental issues (Aguirre, 2020).

Environmental awareness is a critical factor in fostering sustainable waste management practices. Proper waste management helps reduce pollution, protect ecosystems, and improve public health. This study adopts a green criminological perspective, which examines the intersection of environmental harm, human behavior, and justice. By exploring how awareness influences waste management practices, this research aims to provide insights that can guide policymakers and local leaders in designing effective interventions to promote sustainability and compliance with environmental regulations (Wapwera *et al.*, 2022).

Globally, solid waste management is a growing concern, with the World Bank projecting a 70% increase in waste generation by 2050 if current trends continue. Many countries have implemented public awareness campaigns and innovative policies to address this issue. For example, Sweden has become a global leader in waste management through robust recycling programs and waste-to-energy systems (World Bank, 2021). In the Philippines, Republic Act 9003 mandates local government units (LGUs) to implement proper waste segregation and disposal systems. However, challenges persist due to limited resources, weak enforcement, and low public compliance (Asian Development Bank, 2021). While some community-based initiatives have been introduced, their effectiveness is often hindered by inconsistent participation and insufficient education about sustainable practices.

Research on how environmental awareness directly affects individual waste management practices is still lacking, despite the fact that solid waste management has been the subject of countless studies conducted both locally as well as internationally. Additionally, previous research typically concentrates on technical fixes or policy frameworks without taking into account the influence of community attitudes and behaviors from a green criminological standpoint. This study aims to close this gap by examining the connection between waste management practices and environmental

awareness while integrating knowledge from green criminology. The results are intended to provide useful information for encouraging sustainable practices in local communities. This study also aimed to answer the following objectives:

a) To determine the socio-demographic profile of the respondents.
b) To determine the environmental injustices.
c) To identify the waste management practices.
d) To determine the significant difference in the responses of respondents when grouped across socio-demographic profiles.

2. Methods

This chapter reveals the methods of research to be employed by the researcher in conducting the study, including the research locale and duration, and the research design. research sampling, source of data, data gathering procedure, ethical consideration, and data analysis.

2.1 Research Locale and Duration

The study was conducted in Central 2 or Magsaysay 17-4, Barangay Central, Mati City, Davao Oriental, specifically near the coastal road and dumping site, which was chosen due to the persisting issue of solid waste management awareness and practices that revealed a gap between awareness and action. This made them the main subjects for understanding environmental awareness and practices. Additionally, the community's multiple residents over the sociodemographic profile, including age, sex, educational attainment, and ethnicity, produced a thorough description for examining the different levels of environmental awareness, action, and waste management practices.

Moreover, the study's focus and data gathering were limited to Magsaysay 17-4 near the coastal road and dumping site. The study was completed by December 2024. The researchers carefully planned and allocated sufficient time for each procedural step to ensure the study was carried out efficiently and ethically.

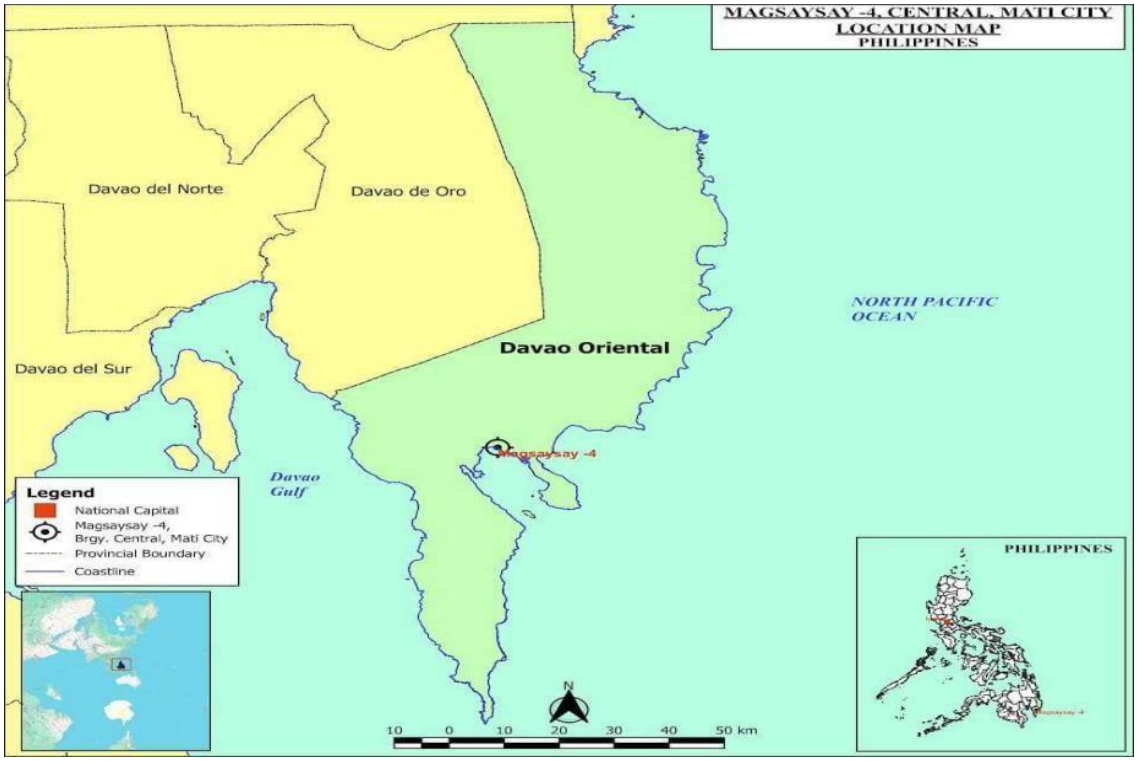

Figure 2: Brgy. Central Mati City, Davao Oriental Map

2.2 Research Design

The research design for this study used a quantitative approach to investigate significant differences in respondents' answers regarding environmental awareness and practices in waste management, grouped by their sociodemographic profiles. Quantitative research was used to measure and analyze numerical data, focusing on statistical patterns and relationships. This method allowed for the statistical analysis of variables to produce valid and reliable conclusions (Jain, 2023).

Specifically, this study employed a descriptive-comparative research design to compare the perceptions of environmental awareness, practices, and waste management practices among respondents grouped according to their sociodemographic profiles. The design was well-suited for this research as it allowed the investigation of whether significant differences existed across groups based on variables such as age, sex, ethnicity, and educational attainment. Using this design, the study gathered data through a structured survey. Descriptive statistics were applied to summarize the sociodemographic profiles, perceptions of environmental awareness and practices, and waste management practices. Comparative statistics were employed to determine whether significant differences existed between the sociodemographic groups in terms of their responses (Creswell, 2018).

2.3 Research Sampling

The sampling method employed in this study was quota sampling. A non-probability sampling method was used to guarantee that different subgroups within a population were equally represented. In this study, the population was divided into distinct strata

based on relevant sociodemographic characteristics such as age, sex, ethnicity, and educational attainment. Each of these factors had been identified as potentially influencing perceptions of environmental awareness and practices in waste management, making it crucial to ensure their proportional representation in the sample (Nikolopoulou, 2022).

After dividing the population into strata, a non-random sample was drawn from each subgroup to ensure that each quota was represented in the sample. This approach allowed for the inclusion of participants from all relevant subgroups, setting a quota of 100 respondents in total for all strata based on relevant sociodemographic characteristics, which was critical for understanding the variation in responses to environmental awareness and practices in waste management.

The respondents of this study were the residents of Magsaysay 17-4, near the coastal road and dumping site; they were chosen because of the gap between awareness and practice, as people may have recognized the value of segregation, yet encountered difficulties in putting it into practice.

2.4 Source of Data

In this study, the researchers used primary and secondary data. The data were collected using a survey questionnaire in the study of environmental awareness and practices in waste management: a green criminological perspective.

The researchers utilized published material pertinent to the study, data from previous studies, and a questionnaire from credible websites. The questionnaire consisted of topics related to the study to gather respondents' opinions, and the data collected provided important information that helped the study identify the level of environmental awareness and practices in waste management.

Additionally, statistical analysis was conducted to examine the residents' environmental awareness and practices in waste management. The study was carefully validated to determine and ensure the questionnaire's credibility, which was necessary to guarantee its authenticity. The validation process evaluated the effectiveness of the questionnaire in producing reliable and accurate data that successfully addressed the research issue.

Table 1: Range of Mean of Environmental Awareness

Range of Mean	Description	Interpretation
4.00 - 3.00	Strongly Agree	Respondents have an excellent understanding on environmental awareness.
2.99 - 2.00	Agree	Respondents have a good awareness of environmental issues.
1.99 - 1.00	Disagree	Respondents have limited awareness recognizing environmental issues.
1.00 - 0.99	Strongly Disagree	Respondents have a minimal understanding of environmental awareness.

Note: Adapted from Research Gate, by M. Md. Yunus, 2020, Copyright 2020 by Research Gate.

Table 2: Range of Mean of Environmental Awareness

Range of Mean	Description	Interpretation
4.00 - 3.00	Strongly Agree	Respondents are highly knowledgeable about waste management practices.
2.99 - 2.00	Agree	Respondents have a good awareness of waste management practices.
1.99 - 1.00	Disagree	Respondents are aware of only a few types of waste management practices.
1.00 - 0.99	Strongly Disagree	Respondents lack understanding of waste management practices.

Note: Adapted from Research Gate, by M. Md. Yunus, 2020, Copyright 2020 by Research Gate.

Table 3: Likert Scale of the Study

Points	Description	Interpretation
1	Strongly Disagree	The level of environment, awareness and waste management practices is very low.
2	Disagree	The level of environmental awareness and waste management practices is low.
3	Agree	The level of environmental awareness and waste management practices is high.
4	Strongly Agree	The level of environmental awareness and waste management practices is very high.

Note: Adapted from Research Gate, by M. Md. Yunus, 2020, Copyright 2020 by Research Gate.

2.5 Data Gathering Procedure

The following steps were followed in gathering the needed data for this study:

- **Request Permission to Conduct the Study.** Initially, the researchers sought permission to conduct the study through the DOrSU - University Research Ethics Board. Necessary revisions were made based on the recommendations. After permission was granted, since the study was carried out in Barangay Central, Mati City, Davao Oriental, a letter was addressed to the barangay captain requesting their approval to perform the study in the designated area.
- **Participating Sites and Infrastructures.** Every respondent involved offered an appropriate setting in which the survey was conducted. Ensuring convenience and anonymity, where the respondents can answer the questions without being disturbed or distracted. Additionally, precautions were made to guarantee that it didn't violate anyone's privacy or cause them any distress, including obtaining informed consent.
- **Explanation of Consent and Purpose of the Study.** The respondents were provided with informed consent explaining the purpose of the study and assuring them that all their information would remain confidential. This suggested that in order to maintain voluntary and willingness, researchers excluded possible respondents without acquiring their permission in the conduct of the study.
- **Administration and Distribution of the Questionnaire.** Once the respondents gave their consent, the survey questionnaire measuring waste management

practices and environmental awareness was distributed, and the respondents individually answered the questionnaire.

- **Retrieval of the Questionnaire.** Afterwards, the survey responses were collected, and it was clear to them that their answers would remain confidential.
- **Interpretation of the Data Gathered from the Respondents.** The answers were then tallied and tabulated for analysis. The researchers sent the raw data to the statistician, who checked, reported, and analyzed the results with the researchers' assistance. Finally, the respondents' answers and the analyzed data were used to draw a conclusion that aligned with the purpose of this research.

2.6 Analysis of Data

After gathering data from participants using the survey questionnaire, the analysis was conducted using the following statistical tools:

Descriptive statistics, specifically the mean, were calculated for each dependent variable to summarize the central tendency of participants' responses. The mean provided a general measure of the average perception or behavior regarding environmental awareness, practices, and waste management practices within each sociodemographic group. Furthermore, ANOVA was utilized to compare the means of the dependent variables across various sociodemographic groups, such as age, sex, ethnicity, and educational attainment. This statistical method determined whether there were statistically significant differences in the means among three or more groups. ANOVA helped identify whether demographic factors like age, sex, ethnicity, and educational attainment significantly influenced participants' responses concerning environmental awareness, practices, and waste management practices.

2.7 Ethical Consideration

In this study, many considerations were carefully addressed, as this study involves significant information from the respondents as to their environmental awareness and waste management practices in several aspects that are thoroughly considered:

- **Informed Consent.** All participants, particularly the residents of Magsaysay 17-4, provided informed consent before participating in the study. The purpose, procedures, risks, and benefits of the research were clearly explained in a language and format that participants could understand. Participants' autonomy was respected by allowing them to freely decide whether or not to participate.
- **Voluntary Participation.** Participation in the research was entirely voluntary, ensuring individuals engaged willingly and without coercion. This principle upheld the autonomy and dignity of participants. In the context of research examining significant differences in responses when grouped by sociodemographic profiles, participants were fully informed about the nature, purpose, and potential impacts of the study.
- **Confidentiality and Anonymity.** The confidentiality and anonymity of participants were protected by securely storing and anonymizing the data

collected during the study. No identifying information was disclosed in research reports or publications that could compromise the privacy or confidentiality of the participants.

- **Minimization of Harm.** Steps were taken to minimize any potential harm or distress to participants during the research process. This included ensuring participants were not coerced or pressured to disclose sensitive information and providing appropriate support or referrals to those who may have experienced emotional distress as a result of participating in the study.
- **Beneficence.** The researchers ensured that the study contributed to the well-being of the community by providing valuable insights to inform interventions, policies, or programs aimed at addressing delinquent behaviors in Magsaysay 17-4, Mati City, Davao Oriental. The research was conducted to maximize its benefits while minimizing potential risks to respondents.

3. Results

This chapter of this study presents the results of the analysis related to environmental awareness in waste management practices. Evaluating these findings in the context of environmental awareness offers an understanding of the systemic issues contributing to inequitable waste management practices.

3.1 Demographic Profile of the Respondents

Table 1: Age Distribution of the Respondents

Age	Frequency	Percent (%)
18 – 25	16	16.00
26 – 33	26	26.00
34 – 41	27	27.00
42 – 49	20	20.00
50 years old and above	11	11.00
Total	**100**	**100.00**

Table 1 presents the age distribution of the respondents. The highest number of respondents came from 34 – 41 years old (27), while the lowest number of respondents were 50 years old and above (11). This implies that this study is perceived mostly by those in the 18 – 25 age interval and least by those 50 years old and above. Moreover, the study is largely from the active working-age groups, with a strong emphasis on individuals in their late 20s to early 40s. These age groups perceived issues of environmental injustice, suggesting waste management strategies to address the priorities and concerns, and considering the engagement of the community.

Table 2: Gender Distribution of the Respondents

Gender	Frequency	Percent (%)
Male	43	43.00
Female	39	39.00
LGBTQIA+	13	13.00
Prefer not to say	5	5.00
Total	**100**	**100.00**

Table 2 presents the gender distribution of the respondents. it could be gleaned in the above table that among the genders, the highest respondents came from male respondents (43), while the lowest number had 5 respondents, these are those who prefer not to say their gender. This implies that the higher number of male respondents implies that men are engaged and participate in studies related to environmental justice and waste management. As such, in this particular study, men are more involved in certain environmental sectors, which could indicate a stronger interest in criminological perspectives related to environmental issues.

The ethnic distribution of the respondents is given in Table 3. The highest number of respondents came from Maranao (25), while the lowest number of respondents was Mandaya (6). The result implies that the Maranao group, having the highest number of respondents, indicates that this ethnic group engaged and participated in the issues of environmental injustice in waste management within the concept of the study. The study provides insights into how waste management challenges are perceived across ethnic groups. These findings are crucial for ensuring that future environmental policies and waste management practices are responsive to the diverse needs of different ethnic communities.

Table 3: Ethnicity Distribution of the Respondents

Ethnicity	Frequency	Percent
Mandaya	6	1.00
Visaya	17	3.00
Maranao	25	8.00
Waray	18	16.00
Cebuano	18	7.00
Kalagan	16	55.00
Total	**100**	**100.00**

The distribution of the educational attainment of the respondents is provided in Table 4. As presented, the highest number of respondents came from those at the high school level (25), while the lowest number of respondents were those at the elementary level (6). This implies that the educational breakdown of respondents in this study reveals a diverse range of educational backgrounds, each offering distinct perspectives on environmental injustice in waste management. The study recognized how education influences respondents' understanding of and engagement with these issues, while also ensuring their perceptions from all educational levels are collected.

These various educational initiatives, based on their responses, could address waste management in a way that is accessible and relevant to all communities, regardless of their formal education level. Moreover, the educational breakdown underscores the importance of considering how education influences individuals' understanding of issues like waste management and environmental justice. Respondents with higher levels of education may have a more technical or analytical approach to these problems, while those with lower educational attainment might emphasize practical or immediate concerns.

Table 4: Educational Attainment Distribution of the Respondents

Educational Attainment	Frequency	Percent (%)
Elementary Level	6	1.00
Elementary Graduate	17	3.00
High School Level	25	8.00
High School Graduate	18	16.00
College Level	18	7.00
College Graduate	16	55.00
Total	**100**	**100.00**

3.2 Level of Environmental Awareness

This section presents the results and discussions on the level of environmental awareness in terms of distribution, intergeneration, and procedure, as measured through mean scores and their corresponding descriptive equivalents. The analysis interpreted the findings based on the responses about environmental awareness.

3.2.1 Distribution

Table 5 shows the distribution of environmental awareness levels. According to the table, the highest mean score was 3.50, indicating strong agreement with the statement that all communities should have equal input and influence in decisions about waste management in their area. The lowest mean score was 3.37, also showing strong agreement, this time with the statement that poor communities are more likely to be exposed to pollution from waste management facilities. The overall mean was 3.45, which also indicates strong agreement.

Table 5: Level of Environmental Awareness in Terms of Distribution

Statement	Mean	Descriptive Equivalent
1. All communities should have equal input and influence in decisions regarding waste management in their area.	3.53	Strongly Agree
2. Everyone has equal access to clean water and air in your area.	3.50	Strongly Agree
3. Wealthier neighborhoods receive more frequent waste collection services than lower-income neighborhoods.	3.47	Strongly Agree
4. There are effective measures in place to protect vulnerable populations from waste-related health hazards.	3.38	Strongly Agree
5. Poor communities are more likely to be exposed to pollution	3.37	Strongly Agree

from waste management facilities.		
Overall Mean	**3.45**	**Strongly Agree**

Environmental awareness is high, with respondents valuing equal access to clean water and protecting vulnerable populations from waste-related health risks. However, poor communities face higher pollution levels from waste facilities, while wealthier areas have better waste collection services. The desire for equal input in waste management decisions highlights the need for inclusive, participatory decision-making to ensure disadvantaged groups are not excluded from influencing policies affecting their health and well-being.

Research often interprets environmental sustainability as a distributive justice commitment among the earth's generations. There is a belief that every generation has an equal claim to the wealth of the natural environment. However, since generations come before one another in time, it is the older generations' duty to ensure that the younger generations receive their fair share (Habib, 2021).

3.2.2 Intergeneration

Table 6 presents the level of environmental awareness in terms of intergeneration. The study found high intergenerational environmental awareness, with a high mean score of 3.53. Future generations should have a larger say in political decision-making, and younger generations are inheriting a more polluted and less hospitable Earth. Proactive steps must be taken to create a more equal future, and young people's increased participation in policy decision-making demonstrates the need to address long-standing environmental injustices and ensure a more sustainable future for all.

Table 6: Level of Environmental Awareness in Terms of Intergeneration

Statement	Mean	Descriptive Equivalent
1. Future generations should have a greater voice in political decision-making processes that affect their futures.	3.53	Strongly Agree
2. Older generations have a responsibility to ensure that policies today do not negatively impact future generations.	3.52	Strongly Agree
3. Older generations should take responsibility for the environmental impact of their lifestyles on future generations.	3.47	Strongly Agree
4. Young people should have a greater say in policy decisions that will impact their future.	3.46	Strongly Agree
5. Younger generations are inheriting a planet that is more polluted and less hospitable than it was for previous generations.	**3.43**	Strongly Agree
Overall Mean	3.48	Strongly Agree

European legislation has pushed for more sustainable waste management practices, but it has been difficult to apply these policies locally. In waste management, the intricate interplay of risks that span both generation and generation necessitates decision-making processes that include the use of suitable instruments and public participation (Schwartz, 2022).

3.2.3 Procedure

Table 7 displays the environmental awareness in terms of procedure. The highest mean score was 3.62, indicating strong agreement with the statement that law enforcement agencies should be more transparent about their procedures and actions. Conversely, the lowest mean score was 3.43, also reflecting strong agreement, on the statement that court systems should provide equal access and treatment to all individuals, regardless of their background. The overall mean score was 3.52, demonstrating strong agreement.

Table 7: Level of Environmental Awareness in Terms of Procedure

Statement	Mean	Descriptive Equivalent
Law enforcement agencies should be more transparent about their procedures and actions.	3.62	Strongly Agree
Certain groups are more likely to experience discriminatory treatment from public officials.	3.56	Strongly Agree
Communities should have more opportunities to provide input on projects that affect them.	3.53	Strongly Agree
Efforts to reduce procedural injustice should focus on increasing fairness and transparency.	3.46	Strongly Agree
Court systems should provide equal access and treatment to all individuals, regardless of their background.	**3.43**	Strongly Agree
Overall Mean	**3.52**	**Strongly Agree**

The result implies that the level of environmental awareness in terms of procedure is very high. The respondents strongly perceived the importance of law enforcement agencies and judicial systems being transparent about their operations to ensure public trust and fairness. Transparency in procedures can help address systemic biases that often lead to discriminatory practices, particularly in how certain groups are treated by public officials. The responses indicate that the respondents acknowledge the reality of discrimination, where disadvantaged communities often face disproportionate treatment due to unequal treatment by those in power.

Moreover, communities, especially those affected by environmental policies, should be given a greater opportunity, and it is necessary to ensure equal access to justice, irrespective of socio-economic or racial background, which is important in the fight against both procedural and environmental injustice.

While several studies have found that blacks, Hispanics, and the poor are disproportionately exposed to pollution hazards, particularly in the United States, far fewer have focused on the mechanisms that contribute to environmental injustices. The study adds to the environmental justice literature by investigating local environmental disputes over a pollution threat (municipal solid trash) to better understand the processes that may sustain environmental inequalities. This case examines both the process of injustice and the experience of injustice. The procedural perpetrators contribute to the creation and perpetuation of environmental injustice, demonstrating that environmental injustice is caused by a number of long-standing practices, and that in order to be

remedied, techniques must be tailored to include an affected population (Hantoko et.al., 2021).

3.3 Waste Management Practices

This section presents the results and discussions on the level of waste management practices in terms of incineration, water waste disposal, and landfilling. The result was presented in a table with mean scores and their corresponding descriptive equivalents.

3.3.1 Incineration

Table 8 presents the level of waste management practices related to incineration. The highest mean score was 3.48, indicating strong agreement with the statement that waste incineration is cheaper to construct and operate than landfills. The lowest mean score was 3.35, also showing strong agreement, on the statement that waste incineration can pollute air and water. The overall mean score was 3.42.

Table 8: Level of Waste Management Practices in Terms of Incineration

Statement	Mean	Descriptive Equivalent
1. Waste incineration is cheaper than landfills to construct and operate.	3.47	Strongly Agree
2. Incineration is the solution to waste management Crisis.	3.44	Strongly Agree
3. Incineration is an effective method for reducing the volume of waste.	3.42	Strongly Agree
4. Proper regulation and monitoring can mitigate the environmental impact of incineration.	3.40	Strongly Agree
5. Waste incineration can pollute air and water.	3.35	Strongly Agree
Overall Mean	**3.42**	**Strongly Agree**

This implies that respondents perceived strong agreement about the waste management practices in terms of incineration. Respondents strongly viewed that incineration is a solution to the global waste management crisis, given its ability to reduce the volume of waste that ends up in landfills. This aligns with the view that incineration can help address the growing problem of waste accumulation in urban areas. Respondents also strongly point out the effectiveness of incineration as a solution to the global waste management crisis, given its ability to reduce the volume of waste that ends up in landfills. This aligns with the view that incineration can help address the growing problem of waste accumulation in urban areas. Respondents also strongly point out the effectiveness of incineration over landfills, noting that incineration facilities can be cheaper to construct and operate. The respondents strongly emphasized the effectiveness of incineration in reducing waste volume, emphasizing its potential to tackle the increasing pressures on landfill capacity. Hence, it is strongly perceived by the respondents that incineration can provide a solution to the growing waste volume and offer cost savings.

The Philippines has a nationwide ban on incineration, making it the only country with such a ban. This study evaluated the technical applicability of a small-scale waste-to-energy incineration for waste reduction and treatment of infectious healthcare waste in San Lazaro Hospital, Manila. The incineration technology is economically feasible and cost-efficient, with pyrolysis being the best available technology. However, the study shows that with engineering controls and techniques, the incineration technology passes all technical applicability criteria (Jacela *et al.*, 2020).

3.3.2 Water Waste Disposal

The degree of waste management procedures pertaining to the disposal of water waste is displayed in Table 9. The assertion that appropriate wastewater disposal is essential for safeguarding the environment and public health had the highest mean score of 3.61. The statement that adequate regulation and enforcement are required to ensure compliance with wastewater discharge requirements received the lowest mean score of 3.49, which also indicates strong agreement. The mean score was 3.55 overall.

Table 9: Level of Waste Management Practices in Terms of Water Waste Disposal

Statement	Mean	Descriptive Equivalent
1. Proper wastewater disposal is essential for protecting public health and the environment.	3.61	Strongly Agree
2. Discharging untreated wastewater directly into water bodies poses significant risks to aquatic ecosystems.	3.59	Strongly Agree
3. Inadequate wastewater disposal can lead to contamination of drinking water sources.	3.55	Strongly Agree
4. Public education and awareness campaigns are important for promoting responsible wastewater management practices.	3.51	Strongly Agree
5. Effective regulation and enforcement are necessary to ensure compliance with wastewater discharge standards.	3.47	Strongly Agree
Overall Mean	**3.55**	**Strongly Agree**

The survey emphasizes the importance of proper water waste disposal for community health and preventing diseases. It calls for strong regulatory frameworks and public education for responsible wastewater management, as untreated wastewater can lead to contamination.

Environmental justice involves distributing environmental goods and harms, addressing responsible industries and their consequences. It addresses issues like resource extraction and waste management, which harm vulnerable communities. Burn plants, landfills, and incinerators are often located near underprivileged neighborhoods, causing noise, litter, and air pollution, leading to health problems.

3.3.3 Landfilling

Table 10: Level of Waste Management Practices in Terms of Landfilling

Statement	Mean	Descriptive Equivalent
Landfill sites should be located away from residential areas.	3.65	Strongly Agree
Landfilling should be used as a last resort after all other waste management options have been considered.	3.58	Strongly Agree
Recycling and waste reduction should be prioritized over landfilling.	3.57	Strongly Agree
Landfilling is a cost-effective method for waste disposal.	3.53	Strongly Agree
Landfilling should be used properly managed to prevent the attraction of pests and vectors.	3.46	Strongly Agree
Overall Mean	**3.56**	**Strongly Agree**

The survey shows strong agreement on waste management practices related to landfilling, emphasizing the need for comprehensive and sustainable practices. Landfilling, despite being cost-effective, has environmental costs like land degradation. Proper management, locating landfills away from residential areas, and preventing pests and vectors are crucial. Respondents believe landfilling should be used as a last resort after recycling and waste reduction have been exhausted.
Landfilling is a responsible and effective method for disposing of municipal solid waste.

Identifying suitable sites is complex and depends on social, environmental, technical, economic, and legal factors. Barangay Tungao and Florida meet economic, environmental, and physical criteria, requiring a geotechnical evaluation. (Macalam *et al.*, 2023).

Table 11: Analysis on the Differences of the Respondents' Responses to Environmental Awareness across Demographic Profiles

	Age	Gender	Ethnicity	Educational Attainment
Delivery of services	0.236 (Not Significant)	0.548 (Not Significant)	0.664 (Not Significant)	0.672 (Not Significant)
Retooled community support program	0.255 (Not Significant)	0.171 (Not Significant)	0.879 (Not Significant)	0.960 (Not Significant)
Enhanced comprehensive local integration program	0.909 (Not Significant)	0.753 (Not Significant)	0.467 (Not Significant)	0.220 (Not Significant)

Table 11 shows no significant differences in respondents' responses to environmental awareness, delivery services, retooled community support program, and enhanced local integration program across demographic profiles. However, respondents' perceptions of environmental injustice differ significantly regardless of age, gender, ethnicity, or educational attainment, indicating no significant difference in perceptions.

Influence perceptions of environmental injustice. This suggests a widespread awareness of environmental justice issues across demographics. The null hypothesis,

which suggests no significant difference in perceptions based on demographic factors, was not rejected, indicating no significant variation in perceptions of environmental justice programs.

Table 12: Analysis of the Differences of the Respondents' Responses to Waste Management Practices across Demographic Profiles

	Age	**Gender**	**Ethnicity**	**Educational Attainment**
Incineration	0.840 (Not Significant)	0.973 (Not Significant)	0.425 (Not Significant)	0.471 (Not Significant)
Wastewater Disposal	0.682 (Not Significant)	0.448 (Not Significant)	0.959 (Not Significant)	0.071 (Not Significant)
Landfilling	0.906 (Not Significant)	0.339 (Not Significant)	0.119 (Not Significant)	0.474 (Not Significant)

On the other hand, Table 12 presents the analysis of the differences in respondents' responses about wastewater management across demographic profiles. Similarly, all indicators for wastewater management, incineration, wastewater disposal, and landfilling do not have significant differences whether it analyzed age, gender, ethnicity, or educational attainment of the respondents since all values in the table are more significant than 0.05. Therefore, the null hypothesis was not rejected. So, the perception of the respondents about wastewater management in terms of incineration, wastewater disposal, and landfilling significantly differs regardless of their age interval, gender, ethnicity, and educational attainment. This indicates that these demographic factors do not significantly vary in how the respondents perceive aspects of wastewater management.

Moreover, the lack of significant differences in perceptions based on demographic factors implies that wastewater management practices, such as incineration, disposal, and landfilling, are perceived as relevant and important across all demographic characteristics. This indicates that wastewater management is a universally recognized concern where the community, irrespective of age, gender, ethnicity, or education, holds a similar understanding or opinion on the practices in wastewater management since findings indicate the respondents' perceptions of wastewater management practices specifically incineration, wastewater disposal, and landfilling do not significantly differ based on demographic variables such as age, gender, ethnicity, or educational attainment. There is no evidence to suggest that these demographic factors influence how individuals view these aspects of wastewater management and environmental injustice. Moreover, in this particular study, the result is opposed to the theory indicated by Chungden *et al.* (2023) about the correlations between sociodemographic factors and waste management. The authors emphasized that the sociodemographic profile, which includes age, occupation, education level, monthly income, location of residence, and number of people per family, has a substantial impact on solid waste management, according to the data. However, a consistent level of performance in the city's solid waste

management was discovered. Nonetheless, gaps must be filled in the following priority order: generation, storage, final disposal, treatment, and recycling. In summary, the city of Chachapoyas's solid waste management is mediocre, highlighting the necessity to fill in these gaps while developing new public policies.

4. Summary

This study aimed to analyze environmental awareness (distribution, intergeneration, and procedure) and assess waste management practices (incineration, wastewater disposal, and landfilling). It also examines the differences in respondents' perceptions of these issues across demographic profiles. Conducted in Central 2, Magsaysay, Barangay Central, Mati City, Davao Oriental, the research sought to raise awareness and propose strategies to address environmental injustice in waste management. A quantitative research design was used to analyze data, assessing the levels of injustice and waste management practices, and an analysis of variance was used to identify significant differences based on sociodemographic profiles.

The study on Environmental Awareness in Waste Management found that most respondents were aged 18-25, with fewer from those 50 and above. The majority were male (43), followed by females (39), LGBTQIA+ (13), and five who did not disclose their gender. Ethnically, most respondents were Maranao (25), followed by Waray and Cebuano (18 each), Visaya (17), Kalagan (16), and Mandaya (6). In terms of education, the highest number had a high school level education (25). Moreover, respondents strongly perceived environmental injustice, highlighting that younger generations face a more polluted world and marginalized communities endure unequal environmental treatment. Poorer areas suffer more pollution from waste facilities, while wealthier areas receive better services. Respondents supported incineration to reduce landfill waste and emphasized proper wastewater disposal for public health. Overall, respondents were receptive to modern technologies, and this study identified significant risk perceptions among officers, including concerns about technical reliability, data security, and potential misuse of new technologies. The study found no significant differences in perceptions based on age, gender, ethnicity, or education, suggesting these factors did not influence views on the issues.

Environmental justice encompasses the distribution of environmental goods and harms, considering who is responsible for creating them and who experiences their consequences. Issues range from local-level siting of polluting industry to international trade in natural resources. Environmental justice includes resource extraction, waste management, and other actions that harm the environment and the most vulnerable communities. The vast majority of burn plants, landfills, dumps, and incinerators are situated close to underprivileged, marginalized, and low-income neighborhoods. Residents have to put up with excessive noise, litter, more cars on the road, odors, and air pollution regularly. Due to overexposure to harmful pollutants and particles,

incinerator emissions cause health problems. These emissions also raise the risk of respiratory and heart diseases, primarily affecting the elderly and children (Dreau, 2022).

5. Conclusion

Based on the results of the study, the researchers concluded that there was high environmental awareness in terms of distribution, intergeneration, and procedure. There was also a high level of agreement on waste management practices in terms of incineration, wastewater disposal, and landfilling. It could also be concluded that perceptions of respondents on environmental awareness as to distribution, intergeneration, and procedure and waste management practices in terms of incineration, wastewater disposal, and landfilling did not significantly differ based on age, gender, ethnicity or education, indicating that demographic factors do not affect how respondents view these issues.

This aligns with the theory of environmental justice, which emphasizes fairness and equal treatment in environmental decision-making, as well as intergenerational equity, which stresses the importance of considering the impact on future generations. The findings also emphasize the procedural justice theory, which highlights transparency, accountability, and participation in environmental governance. Furthermore, the lack of significant differences in perceptions based on demographic factors supports the result that environmental awareness and attitudes toward waste management practices are perceived equally, regardless of individual profiles.

Environmental sustainability is frequently understood by philosophers as an obligation of distributive fairness among the earth's generations. Every generation should receive an equal part of the natural environment's wealth, since, so the belief goes, generations come before one another in time, it is the responsibility of the older generations to make sure that the younger generations get their fair share. Fulfilling this obligation can be achieved by acting sustainably, as sustainable practices aim to protect the environment for future generations.

Conflict of Interest Statement

Any potential conflict of interest in this study was addressed by ensuring that the data were analysed objectively and independently, free from personal bias or prejudice. The integrity of the research process was maintained throughout. Furthermore, there were no direct supervisory or caregiving relationships between the researcher and the participants, thereby eliminating any undue influence or ethical concerns. Based on these considerations, no conflict of interest exists in relation to this study.

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