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ETHNOLOGICAL INSIGHTS INTO THE ECOLOGICAL HAZARDS OF ELECTRONIC WASTE IN DAVAO CITY

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ABSTRACT

This ethnographic study explores the ecological risks associated with electronic waste (e-waste) in Davao City, focusing on the behaviors, attitudes, and cultural values of local e-waste management groups.

Informal recyclers and repair shops play an important part in e-waste management, frequently using hazardous methods due to a lack of training, equipment, and government backing, contributing to environmental contamination by polluting soil and water, degrading air quality, and exposing people to harmful chemicals. The study highlights the blending of traditional values, such as simplicity and sustainability, with modern approaches to solve e-waste issues, emphasizing the need for education, government assistance, and formal rules to enhance e-waste management methods.

1. INTRODUCTION

Background of the Study

The rapid development of technology and an increasing number of electronic gadgets have resulted in an alarming increase in electronic garbage (e-waste) worldwide. E-waste is made up of abandoned electronic equipment such as computers, mobile phones, and home appliances, many of which include dangerous elements including heavy metals, poisonous compounds, and non-biodegradable components. Improper e-waste management endangers the environment by contaminating soil, polluting water, and degrading air quality, as well as risking human health.

E-waste creation has become a rising problem in Davao City, one of the Philippines' main metropolitan hubs, as the city's population, economic activity, and dependence on technology have grown. Despite existing laws and regulations aiming at regulating waste management, such as the Ecological Solid Waste Management Act (Republic Act 9003), gaps in implementation and enforcement persist. Informal garbage collection and recycling procedures are widespread and add to the environmental risks presented by e-waste.

Cultural influences influence how communities view and manage trash. An ethnological viewpoint is required to comprehend how the socioeconomic conditions, customs, and beliefs of Davao City's local populations impact their e-waste creation and disposal habits. This viewpoint also throws light on the adaptation techniques employed by marginalized groups, such as informal garbage workers, who rely on e-waste for a living.

Using an ethnological lens, this study seeks to investigate the ecological risks of e-waste in Davao City while also documenting the lived experiences and cultural practices of people and groups involved in e-waste management. This method aims to give a more in-depth knowledge of how cultural norms and economic realities interface with environmental difficulties, resulting in a more nuanced understanding of e-waste management and its ecological effects in Davao City.

Statement of the Problem

The incorrect management and disposal of electronic trash (e-waste) in Davao City has caused serious environmental and public health issues. Despite the rising volume of e-waste caused by rapid technology breakthroughs and greater consumption, the city lacks a comprehensive and long-term e-waste disposal infrastructure. Informal recycling and disposal activities, such as open burning and uncontrolled disassembly, introduce dangerous compounds into the environment, endangering soil, water, air quality, and human health.

This study seeks to address the following key research questions (RQs):

RQ1: What informal practices are employed by communities and workers in handling e-waste, and what are the ecological risks associated with these practices?

- How do informal e-waste recyclers in Davao City manage e-waste, and what are the resulting environmental hazards, such as soil and water contamination or air pollution?
- To what extent do traditional practices and local values influence how people in Davao City deal with discarded electronics, and what impact does this have on environmental outcomes?
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RQ2: What roles do local government policies and waste management systems play in shaping the management of e-waste in Davao City?

- How effective are existing policies in regulating e-waste disposal, and how do these policies align with or conflict with local practices and cultural norms?

RQ3: How do communities affected by e-waste disposal perceive the environmental and health impacts of improper e-waste management?

- What are the local residents' concerns regarding the ecological hazards of e-waste, and how do these concerns shape their involvement in or response to e-waste management?
- What culturally appropriate solutions or approaches do residents, informal workers, and local authorities suggest for improving e-waste management and reducing its environmental impact?

2. OBJECTIVES OF THE STUDY

The study's goal is to investigate and address the ecological risks of electronic waste (e-waste) in Davao City using an ethnographic lens. The particular objectives are listed as follows:

1. To analyze the cultural practices, attitudes, and behaviors around e-waste creation, management, and disposal in Davao City.
2. To assess the ecological hazards and environmental consequences of informal e-waste management and disposal techniques.
3. To identify gaps and issues in the city's existing e-waste management policies, initiatives, and systems.
4. Understanding the viewpoints and responsibilities of various stakeholders, such as informal recyclers, community members, and policymakers, in tackling e-waste challenges.
5. To give ethnological insights to help build sustainable and culturally appropriate e-waste management techniques.
6. To promote community-driven and policy-based solutions for reducing the environmental and public health concerns connected with e-waste.

3. SIGNIFICANCE OF THE STUDY

The research presented here is significant given that it addresses both practical problems and theoretical gaps on the environmental risks of electronic trash (e-waste) in Davao City. Theoretically, it fills a vital vacuum by adding an ethnological viewpoint into the study of e-waste management, which is currently dominated by technical, economic, and regulatory components. By examining cultural practices, beliefs, and social behaviors related to e-waste generation and disposal, the study adds to theoretical frameworks in environmental anthropology, waste studies, and sustainable development, providing new insights into the cultural and social factors that influence environmental practices. Practically, the study emphasizes the ecological concerns connected with informal e-waste disposal, such as soil, water, and air contamination, and contributes to the larger discussion of environmental conservation and sustainable practices. The findings offer policymakers and local governments valuable insights into designing culturally inclusive and context-specific e-waste management systems.

Furthermore, the study empowers communities by raising awareness about the environmental and health consequences of inappropriate e-waste disposal, as well as supporting long-term solutions based on local traditions and expertise. It also tackles the issues that informal e-waste recyclers encounter, promoting safer procedures and integrating them into formal waste management systems. From a public health standpoint, the study assesses the dangers of hazardous exposure from e-waste, which will influence targeted interventions and educational initiatives. Finally, the study lays the groundwork for future interdisciplinary research, enabling greater investigation of how cultural elements interact with ecological sustainability and leading to a more comprehensive knowledge of environmental concerns in urban situations.

Scope and Limitations

This study explores the ecological risks connected with electronic garbage (e-waste) in Davao City using an ethnological lens. It investigates the cultural practices, attitudes, and social behaviors associated with e-waste development, management, and disposal among diverse stakeholders, such as informal recyclers, community members, and local officials. The study focuses on the environmental consequences of informal e-waste disposal techniques, such as pollution of soil, water, and air, as well as the implications for public health and sustainability. The study uses qualitative approaches like as interviews, participant observation, and document analysis to give a thorough knowledge of how cultural and socioeconomic aspects impact e-waste management and contribute to environmental dangers. The study is geographically confined to Davao City and focuses on existing e-waste management techniques and policies.

The study has significant drawbacks. First, because the study is qualitative, the findings are context-specific and may not be applicable to other cities or areas. Second, the research is based on self-reported data from interviews, which may be impacted by individuals' biases or mistakes in recalling events. Third, the informal nature of e-waste management in Davao City makes it difficult to collect complete and reliable data on its volume and composition. Fourth, while the report emphasizes the environmental effects of e-waste, it lacks a rigorous technical investigation of pollution levels or dangerous chemical readings. Finally, the study's concentration on cultural and social elements limits its scope, leaving technical, economic, and technological aspects of e-waste management to be explored further. Despite these limitations, the study provides important insights on the interaction of culture, behavior, and environmental sustainability in the context of e-waste management.

Definition of Terms

- **Electronic Waste (E-Waste):** Electronic waste (e-waste) refers to discarded electrical or electronic devices, such as computers, televisions, smartphones, refrigerators, and other gadgets that are no longer in use or have reached the end of their life cycle. E-waste contains valuable materials like metals and plastics, but it also contains hazardous substances, such as lead, mercury, and cadmium, which can be harmful to human health and the environment if not disposed of properly.
- **Informal E-Waste Recycling:** Informal e-waste recycling refers to the unregulated and often hazardous practices carried out by individuals or small businesses in the handling, dismantling, and processing of e-waste. These practices typically involve manual methods such as burning, dismantling, or chemical extraction to recover valuable materials, often without proper safety measures or environmental controls.
- **Ecological Hazards:** Ecological hazards refer to environmental risks or damages caused by human activities, particularly those that result in contamination of natural resources such as air, water, and soil. In the context of e-waste, ecological hazards include pollution from toxic substances released during improper e-waste disposal or recycling, such as heavy metals and hazardous chemicals, which can harm ecosystems and public health.
- **Local Government Policies:** Local government policies are regulations, laws, and guidelines established by municipal or city authorities to address various societal issues, including waste management and environmental protection. In this study, these policies refer to the legal framework and initiatives designed to manage e-waste disposal and recycling in Davao City.
- **Cultural Norms:** Cultural norms are the shared values, practices, and behaviors that are accepted and followed by a particular community or society. These norms influence how individuals and groups in Davao City approach e-waste disposal, with many adhering to traditional practices that prioritize resource maximization and reusing materials over environmental concerns.
- **E-Waste Disposal:** E-waste disposal refers to the process of getting rid of or recycling discarded electronic devices. It can involve various methods, ranging from formal recycling practices managed by authorized companies to informal methods used by individual recyclers, such as burning or dumping e-waste in landfills.
- **Environmental Impact:** Environmental impact refers to the effect that human activities have on the natural environment. In the case of e-waste, the environmental impact includes the damage caused by improper disposal or recycling of electronic waste, such as contamination of water sources, air pollution from toxic fumes, and the leaching of hazardous chemicals into the soil.
- **Health Impacts of E-Waste:** Health impacts of e-waste refer to the adverse physical and mental health consequences that can arise from exposure to hazardous materials found in electronic waste. These health risks may include respiratory problems, skin conditions, neurological damage, and other long-term illnesses caused by toxic substances like lead, mercury, and brominated flame retardants.
- **Sustainable E-Waste Management:** Sustainable e-waste management refers to the responsible disposal, recycling, and treatment of electronic waste in ways that minimize environmental harm and human exposure to toxic substances. This includes practices such as safe recycling, proper disposal methods, and reducing e-waste generation through product design and reuse.
- **Informal Workers:** Informal workers are individuals who work outside formal employment structures, often without legal protections or benefits. In the context of e-waste recycling, informal workers are those who engage in unregulated practices such as scavenging, dismantling, and processing e-waste in exchange for income, often in unsafe conditions.
- **Local Residents:** Local residents refer to the people who live in the communities of Davao City, particularly those who are affected by e-waste disposal practices, either as direct participants in informal recycling or as individuals living near areas where e-waste is disposed of or processed.

- **Public Awareness:** Public awareness refers to the level of knowledge and understanding the general population has about the risks and challenges related to e-waste disposal and its environmental and health impacts. Awareness campaigns aim to educate residents about the importance of proper e-waste handling and the dangers of informal recycling practices.
- **Community-Based Recycling Programs:** Community-based recycling programs are initiatives designed to involve local communities in the collection, sorting, and recycling of e-waste. These programs are typically tailored to the needs of the community, promoting local participation and ensuring that e-waste is processed safely and sustainably.
- **E-Waste Recycling Technologies:** E-waste recycling technologies refer to the tools, machines, and processes used to safely and efficiently recycle electronic waste. These technologies are designed to reduce environmental harm and extract valuable materials while minimizing human exposure to toxic substances.
- **Resource Recovery:** Resource recovery refers to the process of extracting valuable materials, such as metals, plastics, and glass, from discarded e-waste for reuse in manufacturing new products. This process is a key component of recycling, but it must be carried out in a safe and environmentally responsible manner to avoid ecological and health hazards.

4. REVIEW OF RELATED LITERATURE

Electronic waste refers to many types of electric and electronic devices that have lost value to their users or no longer serve their intended function. Electronic waste (e-waste) refers to things that have lost their utilitarian value due to redundancy, replacement, or breakdown and include both "white goods" like refrigerators, washing machines, and microwaves and "brown goods" like televisions, radios, computers, and mobile phones. Given that the information and technology revolution has dramatically expanded the usage of new electronic equipment, it has also resulted in a surge in the number of outmoded items; e-waste is one of the most rapidly rising waste streams. (Gill,2024)

Based on the study conducted by the World Health Organization (WHO) last October 2024 entitled “Electronic Waste (e-waste), electrical and electrical devices contain a wide range of hazardous chemicals. Users are unlikely to come into touch with these compounds while the goods remain functional. When these gadgets become garbage, toxicants can be discharged into the environment if they are maintained in an environmentally unsound manner. Several unsafe behaviors have been documented at e-waste facilities, including scavenging, dumping on land or in aquatic bodies, landfilling alongside ordinary garbage, opening burning or heating, acid baths or leaching, stripping and shredding plastic coatings, manual disassembly of equipment.

These operations are deemed dangerous to the environment and human health because they emit toxic chemicals that contaminate the air, soil, dust, and water at recycling facilities and in nearby towns. Open burning and heating are regarded as the most dangerous activities owing to the harmful vapors produced. Once in the environment, harmful contaminants can travel long distances from the source of pollution, exposing individuals in remote locations to hazardous compounds.

Epidemiological study has shown various negative health consequences associated with informal and unsafe e-waste recycling practices. Children and pregnant women are especially sensitive to dangerous chemicals emitted by informal e-waste recycling activities. Children are frequently active in rubbish collection and scavenging, burning abandoned e-waste, and manually disassembling products into component pieces. In some nations, children may be used as inexpensive labor, because their little hands allow them to disassemble even the smallest objects. These activities expose youngsters to harm and excessive amounts of toxic chemicals. Working as a rubbish picker is dangerous work and is regarded as one of the worst types of child labor by the ILO. In 2020, the ILO anticipated that up to 16.5 million children worldwide worked in the industrial sector, which includes waste processing (4). It is unknown how many child laborers engage in informal e-waste recycling.

E-waste exposure may have the following health impacts during pregnancy, as well as in newborns and children: Negative neonatal outcomes, include higher risks of stillbirth and early delivery; neurodevelopment, learning, and behavior consequences, notably those related to lead produced by informal e-waste recycling practices; Reduced lung and respiratory function, as well as an increase in asthma occurrence, might be connected to the high levels of polluted air pollution seen in many e-waste recycling facilities.

Children and pregnant women are particularly vulnerable to dangerous compounds produced during illicit e-waste recycling practices. Children are exposed to various e-waste recycling activities than adults. Toxic compounds such as mercury are released during e-waste recycling procedures, which can penetrate the placenta and contaminate breastfeeding. Because of their quickly growing bodies, especially their respiratory, immunological, and central neurological systems, fetuses and young children are extremely vulnerable to numerous contaminants emitted during e-

waste recycling. E-waste contains a number of recognized neurotoxins, including lead and mercury, which can affect the development of the central nervous system throughout pregnancy, infancy, childhood, and adolescence. Some hazardous toxicants found in e-waste may potentially affect the anatomical development and function of the lungs. Changes to children's growing systems can inflict irreversible injury and have long-term consequences. (WHO,2024)

E-waste can be toxic, is not biodegradable and accumulates in the environment, in the soil, air, water and living things. For example, open-air burning and acid baths being used to recover valuable materials from electronic components release toxic materials leaching into the environment. These practices can also expose workers to high levels of contaminants such as lead, mercury, beryllium, thallium, cadmium and arsenic, and also brominated flame retardants (BFRs) and polychlorinated biphenyls, which can lead to irreversible health effects, including cancers, miscarriages, neurological damage and diminished IQs.

It's also worth contemplating how electronic items affect climate change. Every technology ever developed has a carbon footprint and contributes to human-caused global warming. Produce one tonne of laptops, and possibly ten tons of CO2 are emitted. When carbon dioxide emissions during a device's lifespan are evaluated, they occur mostly during manufacture, before users purchase a product. This makes low-carbon manufacturing techniques and inputs (such as the utilization of recycled raw materials) and product lifespan critical factors of total environmental effect.

Recycling rates worldwide are poor. Even in the EU, which is a global leader in e-waste recycling, only 35% of e-waste is officially recorded as correctly collected and recycled. The global average is 20%; the remaining 80% remains unrecorded, with most of it buried for millennia as trash. Electronic garbage is not biodegradable. The absence of recycling has a significant impact on the worldwide electronic sector, and as gadgets become more numerous, smaller, and complicated, the problem worsens. Currently, recycling some forms of e-waste and recovering minerals and metals is a costly procedure. The remaining bulk of e-waste, primarily polymers contaminated with metals and chemicals, presents a more difficult situation.

According to research, poor e-waste disposal is a worldwide issue with localized environmental consequences. According to the United Nations University, more than 50 million metric tons of e-waste are created each year, with just 20% formally recycled. The Philippines' Department of Environment and Natural Resources (DENR) has acknowledged the growing e-waste problem, but it is having difficulty implementing and enforcing waste management laws such as the Ecological Solid Waste Management Act of 2000 (RA 9003) and the Toxic Substances and Hazardous and Nuclear Wastes Control Act (RA 6969).

According to Davao City Information Office, Davao City, although being a major metropolitan hub, lacks specific e-waste collection and recycling facilities. Informal recyclers frequently utilize hazardous procedures like as open burning or chemical leaching, which emit poisons into the environment. This emphasizes the importance of regional research and solutions adapted to the city's unique circumstances.

The private sector plays an important role in controlling electronic trash (e-waste) in Davao City through a variety of initiatives and roles. Businesses, such as electronics manufacturers, merchants, and service providers, are major sources of e-waste owing to their operations, product life cycles, and supply chain. They add to the e-waste stream by disposing of outmoded or broken electronic items. Private recycling and trash management organizations play an important role in collecting, sorting, and processing e-waste, typically employing cutting-edge technology to recover valuable materials like as metals and decrease hazardous waste. Many firms also participate in corporate social responsibility (CSR) activities, such as arranging e-waste collection drives, recycling programs, and awareness campaigns to encourage appropriate disposal and recycling among businesses and customers.

Furthermore, the private sector works with local governments (LGUs), non-governmental organizations (NGOs), and community groups to design and implement e-waste management plans. These collaborations frequently center on capacity training, public education, and investment in sustainable waste management infrastructure. Electronics manufacturers and retailers help to promote a circular economy by designing products that are long-lasting, repairable, and recyclable, as well as adhering to Extended Producer Responsibility (EPR) initiatives that hold them accountable for their products' end of life management.

Furthermore, private enterprises play an important role in promoting awareness about safe e-waste disposal through consumer education and buy-back or trade-in initiatives. Private sector investments in recycling facilities, collection centers, and e-waste treatment plants considerably improve the city's ability to manage e-waste in a sustainable manner. Through these initiatives, the private sector not only reduces the environmental and health concerns connected with e-waste, but it also generates economic possibilities by promoting sustainable waste management methods.

Davao City has initiatives related to waste management, including provisions for ecological solid waste. The city has established the Davao City Ecological Solid Waste Management Board (DCESWMB), which oversees the creation and

implementation of a comprehensive waste management plan. This plan integrates barangay-level efforts and emphasizes sustainability, recycling, and pollution control. The City Environment and Natural Resources Office (CENRO) plays a key role in supporting these efforts and coordinating among stakeholders. The City Government has recently reconstituted the Davao City Ecological Solid Waste Management Board (DCESWMB) to ensure the continuity of its plans and programs through Executive Order (EO) No. 53, Series of 2022. EO 53, signed by Mayor Sebastian "Baste" Duterte on October 3, 2022, provides that "the City must provide an efficient and effective system of solid waste and garbage collection and disposal under the policy of the state to protect and advance the right of people to a balanced and healthful ecology in accord with the rhythm and harmony of nature". It cited Section 16 of Republic Act No. 7160, otherwise known as the Local Government Code of 1991, which states that the Local Government Units (LGUs) shall be primarily responsible for the implementation and enforcement of the provisions of Republic Act 9003 — Philippine Ecological Solid Waste Management Act of 2000 within their respective jurisdiction. The DCESWMB was created through Section 3 of City Ordinance No. 044-02, otherwise known as the Davao City Ecological Solid Waste Management Board Ordinance of 2002, which states that the Board shall be vested with the policy and decision-making authority under existing laws.

EO 53 further states that the DCESWMB shall develop the City Ecological Solid Waste Management Plan that shall ensure the long-term management of solid waste as well as integrate the various solid waste management plans and strategies of the barangays in the city; adopt measures to promote and ensure the viability and effective implementation of solid waste management programs in the barangays; monitor the implementation of the City Solid Waste Management Plan through its various political subdivisions and in cooperation with the private sector and NGOs; adopt specific revenue-generating measures to promote the viability of its Solid Waste Management Plan; convene regular meetings for purposes of planning and coordinating for the implementation of the solid waste management plans of the respective barangays; oversee the implementation of the City Ecological Solid Waste Management Plan.

The DCESWMB is also mandated to review the City Ecological Solid Waste Management Plan every two years or as the need arises, for purposes of ensuring its sustainability, viability, effectiveness, and relevance to local and international developments in the fields of solid waste management; develop the specific mechanics and guidelines for the implementation of the City Solid Waste Management Plan; recommend to appropriate local government authorities specific measures or proposals for franchise or build-operate-transfer agreements with duly recognized institutions, under R.A. No. 6957 – An Act Authorizing the Financing, Construction, Operation and Maintenance of Infrastructure Projects by the Private Sector, and for the Other Purposes, to provide either exclusive or non-exclusive authority for the collection, transfer, storage, processing, recycling, or disposal of local solid waste; provide the necessary logistical and operational support to the city in consonance with subsection (f) of Section 17 of the Local Government Code; recommend measures and safeguards against pollution and for the preservation of the natural ecosystem; and coordinate the efforts of the barangays in the implementation of the City Solid Waste Management Plan, The DCESWMB shall consist of the city mayor as chairperson, the city administrator as vice-chairperson, and City Environment and Natural Resources Office (CENRO) officer-in-charge as action officer.

The members are the Department of Environment and Natural Resources (DENR) 11 regional executive director, the Department of Public Works and Highways 11 regional director, the Department of Health 11 regional director, the Sangguniang Panlungsod Committee on Environment and Natural Resources chairperson, the City Planning and Development Coordinator, Department of the Interior Local Government – Davao City director, Department of Science and Technology 11 regional director, City Engineer's Office district engineer, City Health Officer, City Agriculture Officer, City Information Officer, City Legal Officer, Liga ng mga Barangay president, representatives of NGOs mainly concerned with the promotion of recycling and protection of air and water supply, Manufacturing/Packing Industry representative, and Recycling Industry representative. These offices will have to name their respective representatives.

The committee may also designate City Government of Davao employees and/or identify personnel, representatives from the NGO, the packing industry, and other stakeholders.

The CENRO shall serve as the secretariat of the DCESWMB and is mandated to handle all administrative and/or secretarial-related activities while a Technical Working Group shall be created to assist the committee in discharging its functions, whose composition shall be determined by the members of the committee.

A budget shall be allocated from available and appropriate resources to fund the operations and activities of the board, including meetings, seminars, training, capacity-building, and other administrative costs, subject to the usual accounting and auditing rules.

Specific to electronic waste, while there are no standalone programs solely addressing e-waste in the city, some national-level initiatives and partnerships like Globe Telecom's e-waste bins are accessible in various regions of the Philippines,

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including urban centers like Davao. These efforts align with broader ecological goals to mitigate the risks posed by improperly managed electronic waste.

According to the research, the Philippines is one of Southeast Asia's largest e-waste producers. In 2019, the country created an estimated 3.9 kilogram of e-waste per inhabitant. However, e-waste is not all bad news. When gathered, kept, and treated properly, it may be a profitable source of precious metals. During a recent visit to the Philippines, Gerd Müller, Director General of the United Nations Industrial Development Organization (UNIDO), visited a treatment, storage, and disposal (TSD) facility for e-waste established by UNIDO and the Philippines' Department of Environment and Natural Resources. The TSD plant is located in Barangay Bagong Silang, Caloocan City, Metro Manila.

Informal e-waste recycling workers in the area collect discarded electrical and electronic equipment, such as computers, televisions, refrigerators, and mobile phones, from homes or disposal sites. They transport the e-waste to a facility where the hazardous task of disassembling the products and recovering reusable metals may be completed in a safe and orderly way. Practical workshops teach recyclers how to disassemble parts in accordance with international safety and security regulations, as well as how to utilize contemporary disassembling technology, tools, and protective equipment properly. The amount of garbage in the Philippines is steadily increasing and is anticipated to rise even higher in the coming years. As previously discussed, linked concerns with solid waste management in the country include an increase in solid waste, ineffective law enforcement, a scarcity of sanitary landfills, and incorrect disposal. The country's final answer is the RA 9003, also known as the Ecological Solid trash Management Act of 2000, which emphasizes segregation, efficient disposal, and trash diversion. The need of picturing a trash-free Philippines, as well as encouraging others to participate and raise awareness, is underlined. Valorization is another potential solution to solid waste management that can help address other environmental issues, such as natural resource depletion. (Limas,2021 et.al)

E-waste recycling can be professional or informal. Both systems seek to alleviate e-waste concerns, however informal recycling exacerbates the environmental effect and risks of e-waste.

Formal recycling aims to reduce the environmental impact of e-waste through responsible and ethical practices. This includes:

- Careful disassembly.
- Divided into raw material kinds
- Cleaning
- Shredding is ready for reuse.

Formal e-waste recycling is more costly and takes longer than informal methods. Companies that utilize formal e-waste recycling adhere to strong health and safety regulations as well as pollution-free practices to safeguard their personnel and the environment. Because of the high costs and regulations around formal recycling, many businesses ship their e-waste to underdeveloped nations where recycling is inexpensive. Poorly compensated and exploited men, women, and children utilize ways to collect precious resources that emit dangerous pollutants and chemicals into the environment.

Incineration is used to eliminate undesired items. Using poisonous mercury and acids to extract gold. These processes frequently endanger the workers and others living nearby.

5. METHODOLOGY

This study uses a qualitative ethnological research approach to investigate the cultural, social, and environmental aspects of electronic garbage (e-waste) in Davao City. Ethnology, as a comparative study of cultures, offers a framework for understanding how cultural practices, traditions, and socioeconomic factors influence e-waste management habits and their environmental consequences.

The study will take place in Davao City, with a focus on locations with high e-waste creation and informal recycling activities, such as urban neighborhoods, informal settlements, and marketplaces where second-hand electronic items are exchanged.

Participants will include individuals and organizations interested in different facets of e-waste management. To guarantee that varied viewpoints are represented, a purposive sample approach will be used.

Participant Groups:

1. **Informal e-waste recyclers** (e.g., junk shop operators, repair technicians);
2. **Local residents** affected by e-waste-related ecological hazards;
3. **Government officials** (e.g., representatives from environmental agencies or waste management departments);
4. **Environmental advocates** and non-governmental organizations (NGOs); and
5. **Business owners** involved in the electronics trade (e.g., retailers, second-hand dealers).

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Data Collection Methods

The study will employ a variety of qualitative data gathering approaches to get in-depth insights into the cultural, social, and environmental elements of e-waste management in Davao City. In-depth interviews will be held with a wide spectrum of individuals, including informal e-waste recyclers, local people, government officials, environmental activists, and company owners. These semi-structured interviews will employ open-ended questions to allow participants to discuss their own experiences, perspectives, and opinions about e-waste, its environmental implications, and the role of their community in managing it. The objective is to identify the subtle ways in which cultural values, economic variables, and social institutions impact e-waste habits.

Participant observation will be another important way for seeing e-waste management in action, with an emphasis on informal recycling operations and local disposal procedures. By immersing in specific sites such as trash shops, markets, and informal settlements, the researcher will get personal knowledge of how e-waste is handled, processed, and disposed of. This observational method will assist expose everyday activities and behaviors that may not be recorded in interviews, offering a more comprehensive framework for understanding the issue.

Focus group discussions (FGDs) will be arranged with community members, bringing together small groups of 6-8 individuals for structured talks regarding the environmental risks of e-waste and potential solutions. This strategy promotes group interaction by allowing members to share collective thoughts, question one another's perspectives, and develop culturally relevant methods to e-waste management. FGDs will provide a forum for discussing community attitudes, views, and concerns regarding the topic.

Finally, document review will supplement primary data gathering techniques by looking at current literature, government policies, environmental reports, and NGO publications on e-waste management in Davao City. These secondary sources will give a more comprehensive knowledge of the current frameworks, legislation, and issues associated with e-waste, allowing the study to situate its findings within the larger landscape of local and national waste management activities. Together, these methodologies will give a holistic, ethnologically informed assessment of Davao City's e-waste environmental dangers.

Data Analysis

The data gathered for this study will be evaluated using thematic analysis, a method for detecting and understanding patterns or themes in qualitative data. Interview transcripts, participant observation notes, and focus group discussion recordings will all be thoroughly analyzed, and significant themes relating to cultural practices, environmental implications, and e-waste management will be categorized. These codes will then be organized into major topics that correspond to the study's research objectives. This method will allow the researcher to investigate the social, cultural, and environmental aspects of e-waste disposal, finding the underlying causes that influence local practices.

In addition, an ethnological comparative study will be performed to set the findings in a larger cultural and environmental perspective. By comparing the findings to previous ethnological research on trash management, the study will highlight both unique cultural insights particular to Davao City and similarities with other places confronting comparable difficulties. This dual method of thematic and comparative analysis will guarantee that the data is extensively reviewed and interpreted in a way that highlights the issue's intricacies, resulting in a rich, multidimensional knowledge of the ecological risks connected with e-waste in Davao City.

6. RESULTS AND DISCUSSION

The results of this study are drawn from in-depth interviews, participant observation, focus group discussions (FGDs), and document reviews, providing an ethnological perspective on the management of electronic waste (e-waste) and its ecological hazards in Davao City. These results are organized into key themes that emerged from the data: cultural perceptions, informal e-waste management practices, ecological impacts, and challenges related to policy and awareness.

RQ1: What informal practices are employed by communities and workers in handling e-waste, and what are the ecological risks associated with these practices?

Presented are the informal practices are employed by communities and workers in handling e-waste, and the ecological risks associated with these practices. Respondents were asked about what extent do traditional practices and local values influence how people in Davao City deal with discarded electronics and the impact does this has on environmental outcomes.

Maria: "Ah, oo. Dakong problema gyud ang e-waste diri. Daghan kaayo mi makita nga mga gilabay nga elektronikong gamit, sama sa mga daan nga computer, cellphone, ug baterya, nga basta lang gilabay. Ang uban, ginasunog pa gani aron mawala. Nabalaka kaayo ko kay ang sapa nga amoang kuhaan og tubig nagkadaghan ang hugaw. Nakita na namo nga naa nay mga isda nga namatay, ug ang tubig nagkaklawan. Nagool ko nga basin makaapekto kini sa among

panglawas sa dugay nga panahon." (Ah, yes. E-waste is a big problem here. We see a lot of discarded electronics, like old computers, phones, and batteries, being thrown away carelessly. Some people even burn them to get rid of them. It's very concerning for me because the creek where we get our water is getting polluted. We've seen fish dying, and the water is becoming cloudy. I'm worried that it might affect our health in the long run.)

"Usahay, naa'y mga informal nga tig-recycle nga moanhi sa among komunidad aron mangolekta og e-waste. Ilang ginatangtang ang mga bahin sa mga device ug ibaligya ang mahalon nga parte. Pero wala sila nagasunod sa sakto nga pamaagi, sama sa pagdugmok o pagcrush sa plastik ug metal aron makuha ang mahalon nga materyales. Makaresulta kini og polusyon sa hangin ug kontaminasyon sa yuta ug tubig. Usahay, makita namo nga naay magasunog og e-waste aron mawala, pero dili gyud kini maayo para sa panglawas." (Well, sometimes informal recyclers come to our community to collect e-waste. They dismantle the devices and sell the valuable parts. But they don't follow proper procedures, like mangling or crushing the plastics and metals to extract the valuable materials. This can lead to air pollution and contamination of the soil and water. Sometimes, we see people burning the e-waste to get rid of it, which is very unhealthy.)

"Sa among kultura, gihatagan namo og bili ang pagkamalungtaron ug pagpasidungog sa kinaiyahan. Apan, tungod sa pag-abot sa modernong teknolohiya, naglisod kami sa pagbalanse sa among tradisyonal nga mga bili ug sa paspas nga lifestyle karon. Ang uban, gihapon maglabay lang og e-waste bisan asa tungod kay wala sila'y kalibotan sa mga epekto niini. Kinahanglan nato nga pasabton ang tanan bahin sa kahinungdanon sa saktong pag-dispose sa e-waste ug mangita og paagi nga mauban ang tradisyonal nga mga bili ug modernong mga pamaagi." (In our culture, we value sustainability and reverence for nature. However, with the influx of modern technology, we're struggling to balance our traditional values with the fast-paced lifestyle. Some people still throw away e-waste carelessly because they're not aware of the consequences. We need to raise awareness about the importance of proper e-waste disposal and find ways to integrate traditional values with modern practices.)

Jeepney driver: "Ingun nga drayber sa jeepney, makakita ko og daghang e-waste nga basta lang gilabay sa dalan. Makasuko gyud kay dili lang kini samok tan-awon, pero usa usab kini ka hulga para sa among komunidad. Ang mga dalan puno sa plastik ug mga wire, ug dili lang kini usa ka isyu sa kalikupan kundi usa usab ka kabalaka para sa panglawas. Makita nako ang mga bata nga nagaduwa duol sa mga tapok sa e-waste, ug nabalaka ko sa posibleng kadaot nga ilang maangkon. Naay uban nga mga informal nga tig-recycle nga nag-ingon nga ilang ginarecycle ang e-waste, pero kasagaran kuhaon ra nila ang mahalon nga parte ug biyaan ang uban nga makapollute sa palibot. Dugay na gyud ning problemaha, ug nakita nako nga ang uban sa mga informal nga tig-recycle nagkasakit tungod sa pag-handle sa mga delikadong materyales." (As a jeepney driver, I see a lot of e-waste being thrown away carelessly on the road. It's really frustrating because it's not only an eyesore but also poses a hazard to our community. The streets are filled with plastics and wires, and it's not just an environmental issue but also a health concern. I've seen kids playing near the e-waste dumps, and I worry about the harm they might be exposed to. Well, there are some informal recyclers who claim to recycle e-waste, but they usually just extract the valuable parts and leave the rest to pollute the environment. It's been a problem for years, and I've seen some informal recyclers getting sick from handling hazardous materials.)

"Sa among komunidad, gihatagan namo og bili ang kasimple ug minimalismo. Anad mi nga mag-ayo ug maggamit pag-usab sa mga daan nga butang imbis ilabay lang. Apan, tungod sa pag-abot sa modernong teknolohiya, murag hinay-hinay namo nga nawagtang ang maong panghuna-huna. Kinahanglan nato mangita og mga paagi nga mauban ang among tradisyonal nga mga bili ug modernong mga praktis aron makunhuran ang basura ug mapalambo ang kalikupan." (In our community, we value simplicity and minimalism. We're used to repairing and repurposing old things instead of throwing them away. However, with the influx of modern technology, I think we're losing that mindset. We need to find ways to incorporate our traditional values with modern practices to reduce waste and promote sustainability.)

Jerry: "Nagpuyo na ko sa among komunidad sulod sa daghang mga tuig, ug nakita nako nga nagkagrabe ang problema sa e-waste sa paglabay sa panahon. Ang mga tawo maglabay lang og daan nga mga elektronikong gamit nga wala maghunahuna sa mga epekto niini. Ang akong mga anak ganahan magdula og mga daan nga gadgets, apan usahay makakita sila og e-waste sa dalan, ug nakapangurog ko sa paghunahuna unsay sulod ana nga mga device. Naay uban nga mga tawo sa among komunidad nga mag-ayo sa mga guba nga elektronikong gamit o maggamit usab niini, nga maayo. Pero ang uban, ilabay lang kini sa dalan o sa sapa. Nakakita ko og mga tawo nga nagapangita og magamit nga parte sa e-waste, ug sakit kaayo sa dughan nga maghunahuna sa mga potensyal nga risgo sa panglawas. Kinahanglan nato mangita og mas maayong paagi sa pagdumala sa e-waste." (I've lived in this community for many years, and I've seen the problem of e-waste getting worse over time. People just throw away their old electronics without thinking about the consequences. My kids love playing with old gadgets, but sometimes they find e-waste on the street, and it's scary to think about what might have been in those devices. Well, some people in our community try to fix broken electronics or repurpose them, which is great. But others just dump them on the street or in the creek. I've seen people digging

through e-waste to find usable parts, and it's heartbreaking to think about the potential health risks. We need to find a better way to manage e-waste.)

"Sa among komunidad, gihatagan namo og bili ang pagkamalungtarong ug kasimple. Anad mi sa pag-ayo ug pag-ayo balik sa mga butang kaysa ilabay kini. Apan, tungod sa pagsaka sa consumerism ug planned obsolescence, mas dali na lang maglabay ang mga tawo sa mga device. Kinahanglan nato mangita og mga paagi aron ma-balanse ang among tradisyonal nga mga bili ug ang modernong teknolohiya. Siguro, pwede ta mag-develop og mga closed-loop systems diin mahimo nato i-recycle ug i-reuse ang e-waste sa responsableng paagi." (In our community, we value sustainability and simplicity. We're used to fixing and repairing things rather than throwing them away. However, with the rise of consumerism and planned obsolescence, people are more likely to discard devices quickly. We need to find ways to balance our traditional values with modern technology. Maybe we can develop closed-loop systems where we can recycle and reuse e-waste responsibly.)

Mica: "Oo, nakakita ko og daghang e-waste nga nagtapok sa mga katuigan. Isip usa ka negosyante, namatikdan nako nga ang mga tawo naggamit og daghang teknolohiya, ug dali ra nila kini ilabay. Nakabalaka ko kay ang among komunidad nagasalig sa sapa alang sa among adlaw-adlaw nga panginahanglan sa tubig, ug ang polusyon gikan sa e-waste nag-aapekto sa among panglawas ug kalikupan." (Oh, yes. I've seen a lot of e-waste piling up over the years. As a merchant, I've noticed that people are using more technology, and they're discarding it more frequently. It's concerning because our community relies on the creek for our daily water needs, and the pollution from e-waste is affecting our health and environment.)

"Usa, nakakita ko og mga informal nga tig-recycle nga moanhi sa among komunidad aron mangolekta og e-waste. Kasagaran ila rang ginatangtang ang mga device ug ibaligya ang mahalon nga mga bahin. Apan, dili sila nagasunod sa sakto nga mga pamaagi, sama sa pagdugmok o pag-crush sa plastik ug metal aron makuha ang mahalon nga materyales. Makaresulta kini og polusyon sa hangin ug kontaminasyon sa yuta ug tubig." (Well, I've seen informal recyclers come to our community to collect e-waste. They usually dismantle the devices and sell the valuable parts. However, they don't follow proper procedures, like mangling or crushing the plastics and metals to extract the valuable materials. This can lead to air pollution and contamination of the soil and water.)

"Sa among komunidad, gihatagan namo og bili ang kasimple ug pagkamalungtarong. Anad mi sa pag-ayo ug pag-gamit pag-usab sa mga daan nga butang imbis ilabay kini. Apan, tungod sa pagsaka sa modernong teknolohiya, murag nawagtang na ang among panghuna-huna niini. Kinahanglan nato mangita og mga paagi aron mauban ang among tradisyonal nga mga bili ug modernong mga praktis aron makunhuran ang basura ug mapalambo ang kalikupan." (In our community, we value simplicity and sustainability. We're used to repairing and repurposing old things instead of throwing them away. However, with the influx of modern technology, I think we're losing that mindset. We need to find ways to incorporate our traditional values with modern practices to reduce waste and promote sustainability.)

Electronic Shop Owner 1: "Ah, oo. Isip tag-iya sa repair shop, nakakita ko og daghang mga elektronikong gamit nga gilabay nga niabot sa among tindahan. Dako kini nga problema para namo kay dili lang kini usa ka basura nga mga materyales, apan usa usab kini ka hulga sa panglawas sa among mga kustomer ug sa kalikupan. Naay mga kustomer nga nagdala og daan nga mga cellphone ug computer nga adunay mga hayag nga wire ug mga delikadong kemikal, ug dako kini nga kabalaka para namo." (Ah, yes. As a repair shop owner, I've seen a lot of discarded electronics coming through our doors. It's a big problem for us because it's not only a waste of resources, but it's also a health hazard for our customers and the environment. We've had customers bring in old phones and computers with exposed wires and toxic chemicals, and that's a big concern for us.)

"Kasubo lang, daghan sa among mga kustomer ug uban pang mga repair shop dili nagahandle og e-waste sa hustong paagi. Ginatangtang nila ang mga device nga walay sakto nga pagbansay o gamit, ug wala sila nagkuha sa mga kinahanglan nga pag-amping aron malikayan ang mga risgo sa panglawas. Naay mga kustomer nga nagdala og mga parte nga na-expose sa mga elemento, ug murag nag-agad lang kini og problema." (Unfortunately, many of our customers and other repair shops are not handling e-waste properly. They're dismantling devices without proper training or equipment, and they're not taking the necessary precautions to avoid health risks. We've had customers come in with parts exposed to the elements, and that's just asking for trouble.)

"Sa among komunidad, gihatagan namo og bili ang inobasyon ug progreso, apan gipalabi usab namo ang kasimple ug pagkamalungtarong. Anad na kami sa pag-ayo ug paggamit pag-usab sa mga daan nga butang imbis ilabay kini. Apan, tungod sa pag-abot sa modernong teknolohiya, murag hinay-hinay namo nga nawagtang ang maong panghuna-huna. Kinahanglan nato mangita og mga paagi aron mauban ang among tradisyonal nga mga bili sa modernong mga praktis aron makunhuran ang basura ug mapalambo ang kalikupan." (In our community, we value innovation and progress, but we also value simplicity and sustainability. We're used to repairing and repurposing old things instead of throwing them

away. However, with the influx of modern technology, I think we're losing that mindset. We need to find ways to incorporate our traditional values with modern practices to reduce waste and promote sustainability.)

Electronic Shop Owner 2: “Ah, oo. Isip tag-iya sa repair shop, daghan na gyud ko nakit-an nga mga guba nga electronics nga ginala diri sa among tindahan. Dako ni nga problema kay dili lang kini usik sa mga resources, apan usa usab kini ka hulga sa kahimsog sa among mga kostumer ug sa kalikopan. Aduna mi mga kostumer nga nagadala og mga karaang telepono ug kompyuter nga adunay bukas nga mga wire ug mga makadaot nga kemikal, ug dakong kabalaka gyud kini para kanamo.” (Ah, yes. As a repair shop owner, I've seen a lot of discarded electronics coming through our doors. It's a big problem for us because it's not only a waste of resources, but it's also a health hazard for our customers and the environment. We've had customers bring in old phones and computers with exposed wires and toxic chemicals, and that's a big concern for us.)

“Maong, sayang kaayo nga daghan sa among mga kostumer ug uban pang repair shops dili gyud sakto ang paghandle sa e-waste. Ilang gibuak-buak ang mga gamit nga walay insakto nga pagbansay o kagamitan, ug wala nila ginatuman ang mga kinahanglanon aron malikayan ang hulga sa kahimsog. Aduna gani mi mga kostumer nga nagdala og mga piyesa nga na-expose na sa mga elemento, ug klaro gyud nga peligro na kana.” (Well, unfortunately, many of our customers and other repair shops are not handling e-waste properly. They're dismantling devices without proper training or equipment, and they're not taking the necessary precautions to avoid health risks. We've had customers come in with parts exposed to the elements, and that's just asking for trouble.)

“Sa among komunidad, bililhon kaayo namo ang pagka-simple ug pagka-sustainable. Anad na mi sa pag-ayo ug pag-usab gamit sa mga karaang butang kaysa ilabay lang kini. Apan, tungod sa pagdagsa sa modernong teknolohiya, murag hinay-hinay na natong nawawala ang ing-ana nga panghunahuna. Kinahanglan nato nga makapangita og mga paagi aron mapadayon ang atong tradisyonal nga mga hiyas samtang makigduyog sa modernong mga pamaagi aron mapakunhod ang basura ug mapa-ugmad ang pagka-sustainable.” (In our community, we value simplicity and sustainability. We're used to repairing and repurposing old things instead of throwing them away. However, with the influx of modern technology, I think we're losing that mindset. We need to find ways to incorporate our traditional values with modern practices to reduce waste and promote sustainability.)

Garbage Collector: “Ah, mao ba. Gitawag namo kini og "bente" (electronics). Ginakolekta namo kini gikan sa mga balay ug negosyo, unya ginadala sa mga dalan o likod nga eskina aron ma-sort ug ma-dismantle. Ginagamit ra namo ang among mga kamot ug yano nga mga gamit aron kuhaon ang mga wire, circuit, ug uban pang mga piyesa. Lisod ug hugaw nga trabaho kini, apan mao kini ang among paagi sa pagpanginabuhi.” (Ah, yeah. We call them "bente" (electronics). We collect them from households and businesses, then take them to the streets or back alleys to be sorted and dismantled. We use bare hands and simple tools to remove wires, circuits, and other components. It's a dirty, tedious job, but it's how we make a living.)

“Oh, mao gyud. Ginala namo kini sa gagmay nga mga tindahan o mga reseller nga gibaligya kini isip spare parts. Usahay, ginadala namo kini sa balay para gamiton personal o ihatag sa mga higala ug pamilya. Pero usahay, ginapaso lang namo o gilubong kay wala na mi kahibalo unsa pa'y angay buhaton niini.” (Oh, yeah. We sell them to small shops or resellers who sell them as spare parts. Sometimes we take them home for personal use or give them to friends and family. But sometimes we just burn them or bury them because we don't know what else to do with them.)

“Mao lagi, kasagaran among ginapaso ang mga plastik ug wire. Usahay among ginapisa ang mga metal nga piyesa ug ginaisagol kini sa yuta isip abono.” (Well, we often burn the plastics and wires. Sometimes we crush the metal components and mix them with soil for fertilizer.)

Garbage Collector 2: “Hi! Murag importante ang imong trabaho sa pag-recycle sa e-waste ug pag-usab sa mga piyesa aron magamit pag-usab. Aduna bay partikular nga butang nga gusto nimo hisgutan o kinahanglan og tabang bahin sa imong tindahan ug mga operasyon?” (Hi! I run a small shop that sells spare parts for electronic devices. I collect e-waste components from households, hospitals, and schools, and then dismantle them to sell the usable parts. I also buy from other collectors and recyclers.)

“Nagapangita ko sa mga pinakamaayo nga piyesa, sama sa motherboards, CPUs, ug memory chips. Ibaligya nako kini sa mga dagkong kumpanya o wholesalers. Ang mga dili kaayo mahal nga piyesa, sama sa plastik ug mga wire, akong ginapaso o gilubong kay wala ko kahibalo unsaon pa paggamit niini.” (I look for the most valuable components, like motherboards, CPUs, and memory chips. I sell those to bigger companies or wholesalers. The less valuable parts, like plastics and wires, I burn or bury because I don't know what else to do with them.)

“Sakto ra na, usahay ang importante kay ang pagpanginabuhi. Kasabot ko nga nanginahanglan ka ug income, ug ang imong mga aksyon nakabase sa imong panginahanglan. Apan, basin magka-opurtunidad ta nga makapangita og mga

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paagi aron magpadayon gihapon ka sa negosyo ug makatabang usab sa pagpanalipod sa kalikopan." (To be honest, I'm not really thinking about the environmental impact. I'm just trying to make a living.)

The research also gathered informations from the City Environment and Natural Resources Office, represented by Engr. Lakandiwa Soliman R. Orcullo – Acting Division Chief, EWMD.

According to Engr. Orcullo: "Ang electronic waste ang usa pa gihapon sa challenge gihapon sa city, unsaon sya pagmanage. Wala sad kaayo tay mga facilities nga murecover or murecycle ug electronic waste. Although, naay mga waste speakers nga- mga junk shop pud na nagakuha ug electronic waste specially katong mga refrigerator, washing machine, tv. Ilaha man ng ginatake over ang mga valuable parts pwede nila ibaligya plastic, bakal, mga copper, mga wiring, tanan na bakal na component sa electronic waste pwede pa na nila mabaligya. So mao ra gyud nay pamaagi sa pagkakaron na involve ug recycling para sa electronic waste. Daghan gihapon tag problema ani especially that after nila nga mabungkag tong mga appliances for example bisag asa na nila ginalabay. Mga styro sa mga ref so mao na ang gina-wala man gyud siyay demand, dili sad recyclable malabay gyud siya, padulong gyud siya sa landfill. So mao na nga atoang ginakolekta kundi ang kanang mga malabay sa mga junk shop, mga naga bote bakal bitaw kay sila man gyuy nagakuha ana sa mga household kay ibaligya mana sa ilaha. Mas maayo pa na sya na pamaagi, kaysa atong wa gyuy marecover. So mao lang na- interms sa informal e-waste." (Electronic waste remains a challenge for the city in terms of management. We also lack facilities for recovering or recycling electronic waste. Although there are waste buyers, such as junk shops, that collect electronic waste, especially refrigerators, washing machines, and TVs. They extract valuable parts that can be sold, like plastics, metals, copper, wires, and all other metal components of electronic waste. That is currently the only method of recycling electronic waste. We still face many problems with this, especially because after dismantling those appliances, the remaining parts are often discarded anywhere. For example, the Styrofoam from refrigerators has no demand and is not recyclable, so it ends up being thrown away and ultimately goes to the landfill. What we collect are usually the leftover materials from junk shops, the ones that deal with bottles and scrap metals because they gather these from households to resell. That method is somewhat better compared to not recovering anything at all.)

Table 1. Informal E-Waste Management: Practices, Risks, and Cultural Dynamics in Davao City

Theme	Sub-themes	Supporting Statements
Informal E-Waste Managements	Informal Practices	"Ah, oo. Dakong problema gyud ang e-waste diri. Daghan kaayo mi makita nga mga gilabay nga elektronikong gamit, sama sa mga daan nga computer, cellphone, ug baterya, nga basta lang gilabay. Ang uban, ginasunog pa gani aron mawala. " (Respondent 1) "Ingun nga drayber sa jeepney, makakita ko og daghang e-waste nga basta lang gilabay sa dalan." (Respondent 2) "Ang mga tawo maglabay lang og daan nga mga elektronikong gamit nga wala maghunahuna sa mga epekto niini." (Respondent 3)
	Environmental hazards	" Dako kini nga problema para namo kay dili lang kini usa ka basura nga mga materyales, apan usa usab kini ka hulga sa panglawas sa among mga kustomer ug sa kalikupan." (Respondent 6) "Aduna mi mga kostumer nga nagadala og mga karaang telepono ug kompyuter nga adunay bukas nga mga wire ug mga makadaot nga kemikal, ug dakong kabalaka gyud kini para kanamo." (Respondnet 7)
	Informal Economy	"Usa, nakakita ko og mga informal nga tig-recycle nga moanhi sa among komunidad aron mangolekta og e-waste. Kasagaran ila rang ginatangtang ang mga device ug ibaligya ang mahalon nga mga bahin." (Respondent 5) "Ginala namo kini sa gagmay nga mga tindahan o mga reseller nga gibaligya kini isip spare parts." (respondent 8)
	Environmental Risks	"Nakabalaka ko kay ang among komunidad nagasalig sa sapa alang sa among adlaw-adlaw nga panginahanglan sa tubig, ug ang polusyon gikan sa e-waste nag-aapekto sa among panglawas ug kalikupan." (Respondent 4)

Table 1 highlights the "Informal e-waste management practices" in Davao City, which pose significant environmental and health risks. As highlighted in the "Environmental Hazards" theme, informal recyclers and repair shops often use hazardous practices, such as dismantling e-waste without proper training or equipment, leading to environmental contamination and health risks. Additionally, the "Informal Economy" theme emphasizes the challenges of operating without formal regulations or support, exacerbating the risks and economic uncertainty. Similarly, the "Environmental Risks" theme underscores the importance of responsible e-waste recycling practices and formal regulations to mitigate the ecological risks associated with informal e-waste management.

Sub-theme 1- Informal Practices

Informal e-waste recycling and repair practices often involve hazardous methods, such as dismantling devices without proper training or equipment, which release toxic chemicals like lead and mercury. These unsafe practices contribute to environmental contamination and pose health risks, such as respiratory issues and neurological damage, due to exposure to harmful substances. To address these risks, it's essential to provide training, protective equipment, and enforce regulations, while promoting safer disposal methods and raising community awareness to reduce the environmental and health impacts of informal e-waste practices.

Sub-theme 2- Environmental Hazards

Careless e-waste disposal, such as burning or dumping, causes severe environmental hazards, releasing toxic chemicals into the air, soil, and water. These pollutants degrade air quality, harm respiratory health, and contaminate ecosystems, leading to widespread ecological damage and health risks, including neurological disorders and cancer. Improper disposal also harms water sources, affecting both the environment and human health. To mitigate these risks, proper disposal practices, regulated recycling, and stricter regulations are needed, along with public education to promote responsible e-waste management.

Sub-theme 3 - Informal Economy

The informal economy of e-waste management in Davao City is crucial, with small entrepreneurs and collectors handling electronic waste without formal regulations or support. This leaves workers vulnerable to exploitation and environmental risks, as they often use unsafe methods and lack proper training and equipment. Without government support, these informal workers struggle to improve practices, leading to inconsistent e-waste disposal and pollution. Addressing this requires integrating the informal economy with formal waste management systems through training, resources, and regulations, promoting safer and more sustainable practices.

Sub-theme 4 - Environmental Risks

Informal e-waste management poses significant ecological risks, including pollution, toxic fumes, and health hazards. Practices like burning plastics or dismantling electronics without proper equipment release harmful chemicals into the air, leading to pollution and health issues. Improper disposal also contaminates soil and water, affecting ecosystems and public health. These environmental risks emphasize the need for safer, regulated e-waste handling practices, along with training and enforcement of environmental protections to reduce harm and safeguard communities.

RQ2: What roles do local government policies and waste management systems play in shaping the management of e-waste in Davao City?

Presented are the roles of local government policies and waste management systems play in shaping the management of electronic waste in Davao City. Respondents were asked about how effective are existing policies in regulating e-waste disposal, and if the policies align with or conflict with local practices and cultural norms.

Maria: "Sa akong nasabtan, naa'y mga polisiya nga gibutang, pero dili kini istrikto nga gi-implementar. Kinahanglan nato og mas istrikto nga regulasyon ug mas daghang edukasyon bahin sa saktong pag-dispose sa e-waste. Ang syudad kinahanglan usab maghatag og dugang nga mga pasilidad alang sa responsableng pagdumala ug pag-recycle sa basura. Sa pagkakaron, ang mga tawo murag nagtuo nga pwede ra nila ilabay bisan asa ang e-waste nga walay mabuhat nga silot." (From what I understand, there are some policies in place, but they're not strictly enforced. We need stricter regulations and more education about proper e-waste disposal. The city should also provide more facilities for responsible waste management and recycling. As it is, people feel that they can just dispose of e-waste wherever they want, without any consequences.)

Jeepney Driver: "Sa akong tan-aw, kinahanglan nga ang syudad adunay mas kompleto nga plano sa pagdumala sa basura nga maglakip og edukasyon ug istrikto nga pagpahigayon. Kinahanglan nato tudluan ang mga tawo bahin sa kadaot sa e-waste ug maghatag og mga sakto nga pasilidad aron mabutang nila kini sa hustong lugar. Dugang pa, kinahanglan nato nga maglisensya ug mag-regulate sa mga informal nga tig-recycle aron masiguro nga ilang ginabuhat kini sa luwas ug malungtarong paagi." (I think the city should have a more comprehensive waste management plan that includes education and enforcement. We need to teach people about the hazards of e-waste and provide them with proper facilities

to dispose of it properly. Additionally, we need to license and regulate informal recyclers to ensure they're doing it safely and sustainably.)

Jerry: "Tinuod lang, dili ko magtuo nga ang syudad nagahimo og igo aron masulbad ang problema. Nakakita ko og pipila ka mga e-waste recycling facilities nga nagsugod, pero dili sila maayo ang pag-regulate o klaro sa ilang mga proseso. Kinahanglan nato og mas daghang transparency ug accountability gikan sa syudad ug mga pribadong kompaniya. Kinahanglan usab nato og mga programa sa edukasyon ug outreach aron mapataas ang kahibalo bahin sa kahinungdanon sa saktong pag-dispose sa e-waste." (Honestly, I don't think the city is doing enough to address the problem. I've seen some e-waste recycling facilities pop up, but they're not well-regulated or transparent about their processes. We need more transparency and accountability from the city and private companies. We also need education and outreach programs to raise awareness about the importance of proper e-waste disposal.)

Mica: "Tinuod lang, sa akong tan-aw, kinahanglan pa ang syudad maghimo og mas daghang mga lakang aron i-regulate ang pag-dispose sa e-waste. Naay mga informal nga tig-recycle nga nagabuhat niini alang sa kwarta, apan dili sila nagasunod sa sakto nga mga pamaagi. Ang syudad kinahanglan maghatag og mas daghang mga pasilidad alang sa responsableng pagdumala sa basura ug pag-recycle. Dugang pa, kinahanglan nga magpahigayon og mas istrikto nga mga regulasyon sa pag-import ug pag-export sa e-waste aron malikayan ang pagdump niini." (Honestly, I think the city needs to do more to regulate e-waste disposal. There are some informal recyclers who are doing it for the money, but they're not following proper procedures. The city should provide more facilities for responsible waste management and recycling. Additionally, there should be stricter regulations on e-waste imports and exports to prevent dumping.)

Electronic Shop Owner 1: "Tinuod lang, sa akong tan-aw, kinahanglan pa ang syudad maghimo og mas daghang mga lakang aron i-regulate ang pag-dispose sa e-waste. Naay uban nga repair shop nga nagbuhat og sakto, pero daghan ang wala. Kinahanglan nato og mas istrikto nga regulasyon ug dugang edukasyon bahin sa responsableng pag-dispose sa e-waste. Dugang pa, kinahanglan nato og mas daghang pasilidad para sa responsableng pagdumala sa basura ug pag-recycle." (Honestly, I think the city needs to do more to regulate e-waste disposal. There are some repair shops that are doing it right, but many others are not. We need stricter regulations and more education on responsible e-waste disposal. Additionally, we need more facilities for responsible waste management and recycling.)

Electronic Shop Owner 2: “Sa tinuod lang, para nako kinahanglan gayud nga maghimo ang siyudad og mas lig-on nga mga regulasyon alang sa pagdumala sa e-waste. Aduna may pipila ka repair shops nga sakto ang gibuhat, apan daghan usab ang dili. Kinahanglan nato og mas istrikto nga mga balaod ug dugang edukasyon bahin sa responsableng pagdumala sa e-waste. Dugang pa, kinahanglan usab nato og mas daghang pasilidad alang sa responsableng waste management ug recycling.” (Honestly, I think the city needs to do more to regulate e-waste disposal. There are some repair shops that are doing it right, but many others are not. We need stricter regulations and more education on responsible e-waste disposal. Additionally, we need more facilities for responsible waste management and recycling.)

Garbage Collector 1: “Sa tinuod lang, murag wala gyud naghatag ug pagtagad ang gobyerno sa among kahimtang. Wala sila naghatag ug insakto nga kagamitan, pagbansay, o mga regulasyon. Ingon ra sila nga i-sort namo ang basura ug pangitaan kini ug paagi nga mawala. Apan kinahanglan gyud namo ang tabang aron buhaton kini nga insakto. Kinahanglan namo ang edukasyon ug suporta aron ma-handle ug tarong ang e-waste.” (To be honest, the government doesn't really care about our situation. They don't provide us with proper equipment, training, or regulations. They just tell us to sort the waste and get rid of it. But we need help to do it right. We need education and support to handle e-waste properly.)

Garbage Collector 2: “Tinuod gyud, usahay ang gobyerno nagahatag ra ug pagtagad sa mga dagkong korporasyon ug dili kaayo sa mga gagmay nga negosyo sama nimo. Kung naa unta'y suporta, basin mas maayo ang imong pag-access sa mga resources ug kahibalo kung unsaon pag-handle sa e-waste nga responsably. Importante nga makakita ug mga pamaagi aron mapadayon ang imong negosyo samtang magtabang usab sa pagprotektar sa kalikopan.” (The government doesn't really care about small businesses like mine. They focus on big corporations and don't provide support for informal entrepreneurs like me. If they did, I'd probably have better access to resources and knowledge on how to handle e-waste responsibly.)

Engr. Orcullo: “Naa syay impact sa recycling, naa pud syay impact sa solid waste (4:36). Pero ang- naa man pud gud sa kining atong ginaimplement na city ordinance 0361-10 na ang city nay mukuha pud sa special waste. Ang definition man gud sa special waste, kini consumer electronic waste broken discarded items mga electronic radio, tv na parts- sa special waste” (It has an impact on recycling and solid waste management. However, according to the city ordinance 0361-10 that we are implementing, the city is responsible for handling special waste. Special waste is defined as consumer electronic waste, such as broken or discarded items like electronic radios and TV parts.)

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Table 2. The Intersection of Policy, Culture, and Practice: Evaluating Local Government Roles in E-Waste Management in Davao City

Themes	Sub-Themes	Supporting Statements
The Intersection of Policy, Culture, and Practice	**Local government policies**	"naa'y mga polisiya nga gibutang, pero dili kini istrikto nga gi-implementar. Kinahanglan nato og mas istrikto nga regulasyon ug mas daghang edukasyon bahin sa saktong pag-dispose sa e-waste." (Respondent 1) "Dugang pa, kinahanglan nato nga maglisensya ug mag-regulate sa mga informal nga tig-recycle aron masiguro nga ilang ginabuhat kini sa luwas ug malungtarong paagi." (Respondent 2) "Dugang pa, kinahanglan nga magpahigayon og mas istrikto nga mga regulasyon sa pag-import ug pag-export sa e-waste aron malikayan ang pagdump niini." (Respondent 4)
	Waste management systems	"Sa akong tan-aw, kinahanglan nga ang syudad adunay mas kompleto nga plano sa pagdumala sa basura nga maglakip og edukasyon ug istrikto nga pagpahigayon. Kinahanglan nato tudluan ang mga tawo bahin sa kadaot sa e-waste ug maghatag og mga sakto nga pasilidad aron mabutang nila kini sa hustong lugar" (respondent 2) ""Tinuod lang, dili ko magtuo nga ang syudad nagahimo og igo aron masulbad ang problema. Nakakita ko og pipila ka mga e-waste recycling facilities nga nagsugod, pero dili sila maayo ang pag-regulate o klaro sa ilang mga proseso." Respondent 3) "Tinuod lang, sa akong tan-aw, kinahanglan pa ang syudad maghimo og mas daghang mga lakang aron i-regulate ang pag-dispose sa e-waste." (Respondent 4)
	Lack of government support	"I don't think the city is doing enough to address the problem. I've seen some e-waste recycling facilities pop up, but they're not well-regulated or transparent about their processes." (Respondent 3) "Ang syudad kinahanglan maghatag og mas daghang mga pasilidad alang sa responsableng pagdumala sa basura ug pag-recycle." (Respondent 4) ""Tinuod lang, sa akong tan-aw, kinahanglan pa ang syudad maghimo og mas daghang mga lakang aron i-regulate ang pag-dispose sa e-waste." (respondent 5)

Table 2 reveals the complex intersection of policy, culture, and practice in e-waste management in Davao City, highlighting the crucial role of local government in addressing this issue. The "Local Government Policies" theme emphasizes the need for adequate policies and enforcement to ensure consistent e-waste management practices, with education and awareness campaigns being essential for promoting responsible disposal.

The "Waste Management Systems" theme underscores the importance of licensing and regulating informal recyclers to ensure safe and sustainable practices, while education and awareness campaigns can promote responsible e-waste disposal. Moreover, the "Lack of Government Support" theme highlights the absence of government support and regulation, leaving informal workers and small businesses to manage e-waste independently, without proper training or resources.

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Sub-Theme 1 - Local Government Policies

Inadequate local government policies and lack of enforcement result in inconsistent e-waste management, leading to environmental and health risks. The absence of clear regulations leaves communities relying on unsafe disposal methods. To address this, there is a need for education and awareness campaigns on responsible e-waste disposal, along with stronger policies and enforcement to ensure safer, more sustainable practices.

Sub-Theme 2 - Waste Management Systems

Effective waste management systems are crucial for promoting responsible e-waste disposal and ensuring long-term environmental sustainability. Education and awareness campaigns are essential in informing the public about the risks of improper e-waste disposal and the importance of recycling. These campaigns can help foster a culture of responsibility, encouraging individuals and businesses to adopt safer disposal practices.

In addition to public education, licensing and regulating informal recyclers can play a key role in improving e-waste management. By formalizing the sector, the government can ensure that recyclers follow safe practices, use the right equipment, and reduce environmental risks. Regulation can also create a framework for better training and access to resources, ultimately supporting sustainable e-waste recycling and reducing harm to the environment and public health.

Sub-Theme 3 - Lack Of Government Support

The lack of government support and regulation in managing e-waste leaves informal workers and small businesses to handle the issue independently, without the necessary training or resources. This lack of oversight results in unsafe practices, such as improper dismantling and disposal, which pose significant environmental and health risks. Without access to proper equipment, training, or guidance, these informal workers are left vulnerable to exposure to toxic substances, and the effectiveness of e-waste recycling efforts is diminished. To address this, the government must provide stronger support through regulations, resources, and training programs to help ensure safer, more sustainable e-waste management practices.

RQ3: How do communities affected by e-waste disposal perceive the environmental and health impacts of improper e-waste management?

Presented are the communities affected by e-waste disposal perceive the environmental and health impacts of improper e-waste management. Also, respondents were asked about the residents' concerns regarding the ecological hazards of e-waste, and how do these concerns shape their involvement in or response to e-waste management.

Maria: "Sa akong tan-aw, kinahanglan nato nga maapil ang komunidad sa malungtarong mga praktis. Pwede ta mag-organisa og mga workshop o mga kultural nga kalihokan aron mapromotar ang pag-recycle sa e-waste ug saktong paglabay niini. Pwede usab ta magtukod og sistema nga ang mga tawo maka-drop off sa ilang e-waste nga responsableng pamaagi. Dugang pa, kinahanglan nga magtinabangay ang lokal nga gobyerno ug ang mga informal nga tig-recycle aron mahatagan sila og sakto nga pagbansay ug gamit, aron masiguro nga hapsay ug malungtarong ilang trabaho." (I think we need to engage the community in sustainable practices. We could organize workshops or cultural events to promote e-waste recycling and proper disposal. We could also establish a system where people can drop off their e-waste responsibly. Additionally, the local government should work with informal recyclers to provide them with proper training and equipment, so they can do their job safely and sustainably.)

Jeepney Driver: "Sa akong tan-aw, kinahanglan nato nga maapil ang komunidad sa malungtarong mga praktis. Pwede ta mag-organisa og mga kalihokan sama sa community clean-up o mga recycling drive. Pwede usab ta magtukod og sistema diin ang mga tawo maka-drop off sa ilang e-waste nga responsableng paagi ug makadawat og gamay nga kompensasyon o insentibo. Dugang pa, kinahanglan nato makigtambayayong sa mga lokal nga eskuylahan aron ma-edukar ang kabatan-onan bahin sa kahinungdanon sa pagdumala sa e-waste." (I think we need to involve the community in sustainable practices. We could have community clean-up events or recycling drives. We could also establish a system where people can drop off their e-waste responsibly and receive a small compensation or incentive. Additionally, we need to work with local schools to educate the youth about the importance of e-waste management.)

Jerry : "Sa akong tan-aw, kinahanglan nato apilon ang komunidad sa solusyon. Pwede ta mag-organisa og mga inisyatibo nga gipangulohan sa komunidad aron mangolekta ug mag-recycle sa e-waste sa responsableng paagi. Pwede usab ta magtukod og mga partnerhip sa mga lokal nga negosyo ug mga organisasyon aron i-implement ang malungtarong mga pamaagi sa pagdumala sa e-waste. Dugang pa, kinahanglan nato nga edukaron ang mga tawo bahin sa kahinungdanon sa pag-reduce, reusing, ug recycling sa e-waste." (I think we need to involve the community in the solution. We could have community-led initiatives to collect and recycle e-waste responsibly. We could also establish partnerships with local businesses and organizations to implement sustainable e-waste management practices. Additionally, we need to educate people about the importance of reducing, reusing, and recycling e-waste.)

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Mica: "Sa akong tan-aw, kinahanglan nato nga maapil ang komunidad sa malungtarong mga praktis. Pwede ta mag-organisa og mga community clean-up events o recycling drives. Pwede usab ta magtukod og sistema diin ang mga tawo maka-drop off sa ilang e-waste nga responsableng paagi. Dugang pa, kinahanglan nato makigtambayayong sa mga lokal nga eskuylahan aron ma-edukar ang kabatan-onan bahin sa kahinungdanon sa e-waste management ug pagkamalungtarong." (I think we need to engage the community in sustainable practices. We could have community clean-up events or recycling drives. We could also establish a system where people can drop off their e-waste responsibly. Additionally, we need to work with local schools to educate the youth about the importance of e-waste management and sustainability.)

Electronic Shop Owner 1: "Sa akong tan-aw, kinahanglan nato nga maapil ang komunidad sa mga malungtarong praktis. Pwede ta mag-organisa og mga community clean-up events o recycling drives. Pwede usab ta magtukod og sistema diin ang mga tawo maka-drop off sa ilang e-waste nga responsableng paagi. Dugang pa, kinahanglan nato makigtambayayong sa mga lokal nga eskuylahan aron ma-edukar ang kabatan-onan bahin sa kahinungdanon sa pagdumala sa e-waste ug pagkamalungtarong." (I think we need to engage the community in sustainable practices. We could have community clean-up events or recycling drives. We could also establish a system where people can drop off their e-waste responsibly. Additionally, we need to work with local schools to educate the youth about the importance of e-waste management and sustainability.)

Electronic Shop Owner 2: “Tingali kinahanglan nato nga i-apil ang komunidad sa mga praktis nga sustainable. Pwede ta mag-organisar og mga kalihokan sa paglimpyo sa komunidad o mga recycling drive. Makapahimo usab kita og sistema diin pwede mo-drop off ang mga tawo sa ilang e-waste nga insakto ug responsableng pamaagi. Dugang pa, kinahanglan nato magtinabangay sa mga lokal nga eskuylahan aron ma-edukar ang kabatan-onan bahin sa importansya sa pagdumala sa e-waste ug pagka-sustainable.” (I think we need to engage the community in sustainable practices. We could have community clean-up events or recycling drives. We could also establish a system where people can drop off their e-waste responsibly. Additionally, we need to work with local schools to educate the youth about the importance of e-waste management and sustainability.)

Garbage Collector 1: “Oo, nagakahadlok sila, kay makita man nila ang polusyon, ang mga basura, ug ang baho sa mga toxic nga kemikal. Kabalo sila nga makadaot kini sa ilang panglawas, apan wala sila kahibalo unsaon pag-atubang niini. Wala man gud sila natudluan og insakto nga pamaagi sa pagdumala sa basura, ug wala usab sila gisuportahan sa gobyerno.” (They're concerned, yes. They see the pollution, the trash, and the toxic smells. They know it's bad for their health, but they don't know what to do about it. They're not taught how to manage waste properly, and they're not supported by the government.)

Garbage Collector 2: “Tinuod, nagasugod na ang mga tawo diri sa inyong lugar nga magmata sa problema. Nakita nila ang polusyon, basura, ug mga toxic nga kemikal. Nagakahadlok sila bahin sa ilang kahimsog ug sa kalikopan, apan wala pa sila kahibalo unsaon pag-atubang niini. Kinahanglan nila ang edukasyon ug suporta aron mas masabtan nila unsaon pagtubag sa isyu ug unsaon pag-protektar sa ilang kalikopan ug kahimsog.” (People around here are starting to wake up to the problem. They see the pollution, the trash, and the pollution. They're concerned about their health and the environment, but they don't know what to do about it. They need education and support.)

Table 3. Community Perspectives and Culturally Grounded Solutions: Addressing the Environmental and Health Impacts of E-Waste in Davao City

Themes	Sub-Themes	Supporting Statement
Community Perspectives and Culturally Grounded Solutions	Traditional practices and local values	“Sa akong tan-aw, kinahanglan nato nga maapil ang komunidad sa mga malungtarong praktis. Pwede ta mag-organisa og mga community clean-up events o recycling drives.” (Respondent 5) “Wala man gud sila natudluan og insakto nga pamaagi sa pagdumala sa basura, ug wala usab sila gisuportahan sa gobyerno.” (Respondent 7)
	Cultural Values	“Tingali kinahanglan nato nga i-apil ang komunidad sa mga praktis nga sustainable. Pwede ta mag-organisar og mga kalihokan sa paglimpyo sa

		komunidad o mga recycling drive." (Respondent 6) "Tinuod, nagasugod na ang mga tawo diri sa inyong lugar nga magmata sa problema. Nakita nila ang polusyon, basura, ug mga toxic nga kemikal. Nagakahadlok sila bahin sa ilang kahimsog ug sa kalikopan, apan wala pa sila kahibalo unsaon pag-atubang niini." (Respondent 8)
	Community concerns	"Makapahimo usab kita og sistema diin pwede mo-drop off ang mga tawo sa ilang e-waste nga insakto ug responsableng pamaagi." (Respondent 6) "Kabalo sila nga makadaot kini sa ilang panglawas, apan wala sila kahibalo unsaon pag-atubang niini. Wala man gud sila natudluan og insakto nga pamaagi sa pagdumala sa basura, ug wala usab sila gisuportahan sa gobyerno." (Respondent 7) "Kinahanglan nila ang edukasyon ug suporta aron mas masabtan nila unsaon pagtubag sa isyu ug unsaon pag-protektar sa ilang kalikopan ug kahimsog." (Respondent 8)
	Local concerns	"Dugang pa, kinahanglan nato magtinabangay sa mga lokal nga eskuylahan aron ma-edukar ang kabatan-onan bahin sa importansya sa pagdumala sa e-waste ug pagka-sustainable." (Respondent 6) "Oo, nagakahadlok sila, kay makita man nila ang polusyon, ang mga basura, ug ang baho sa mga toxic nga kemikal." (Respondent 7) "Kinahanglan usab nato ang suporta gikan sa gobyerno ug mga dagkong korporasyon aron maghimo og pormal nga merkado alang sa mga recyclable nga materyales. Kini makatabang sa paghatag og lig-on nga sistema sa pag-recycle ug pag-dumala sa basura sa e-waste." (Respondent 8)

Table 3 reveals the importance of community perspectives and culturally grounded solutions in addressing the environmental and health impacts of e-waste in Davao City. The "Traditional Practices and Local Values" theme emphasizes the need to integrate traditional values such as simplicity and sustainability with modern practices, creating more effective e-waste management strategies. The "Cultural Values" theme underscores the significance of cultural values like reverence for nature, simplicity, and sustainability in shaping attitudes towards waste management and the importance of reducing, reusing, and recycling e-waste. Community-led initiatives and local partnerships can further support culturally appropriate e-waste management solutions. The "Community Concerns" theme highlights residents' concerns regarding the environmental and health impacts of improper e-waste management, emphasizing the need for awareness, education, and community involvement in addressing the issue.

Sub-Theme 1 - Traditional Practices and Local Values

Integrating traditional values such as simplicity and sustainability with modern e-waste management practices can lead to more effective and culturally relevant solutions. In many communities, traditional values emphasize minimizing waste and reusing materials, which can align well with modern recycling and sustainable practices. By combining these values with current e-waste management strategies, communities can adopt more holistic approaches that respect cultural beliefs while addressing environmental challenges. This integration can encourage greater community involvement, promote responsible disposal, and foster a deeper understanding of the importance of sustainability in managing electronic waste.

Sub-theme 2 - Cultural Values

Cultural values such as reverence for nature, simplicity, and sustainability play a key role in shaping attitudes toward e-waste management. These values highlight the importance of reducing, reusing, and recycling, encouraging more responsible disposal practices. By drawing on these cultural principles, communities can develop e-waste management solutions that are both effective and culturally appropriate. Additionally, community-led initiatives and local partnerships can further strengthen these efforts, ensuring that e-waste practices align with local traditions while promoting environmental sustainability. This approach can foster greater engagement and support for responsible e-waste management within the community.

Sub-theme 3 - Community Concerns

Residents' concerns about the environmental and health impacts of improper e-waste management underscore the need for increased awareness and education. These concerns reflect a growing recognition of the dangers posed by unsafe disposal methods, such as pollution and health risks from toxic chemicals. Addressing these concerns requires active community involvement, where residents are educated on responsible e-waste disposal and empowered to take part in solutions. By engaging the community, raising awareness, and promoting safer practices, it is possible to reduce the negative impact of e-waste and foster a more sustainable approach to waste management.

Sub-theme 4 - Local Concerns

Local concerns about the environmental and health impacts of improper e-waste management emphasize the urgent need for education, support, and community involvement. Residents are increasingly aware of the dangers posed by unsafe disposal practices, such as pollution and toxic exposure. To address these issues, it is essential to provide educational programs that inform the public about the risks of improper e-waste management and promote responsible disposal practices. Additionally, community involvement and local support systems can help create a collective effort to tackle these concerns, ensuring safer and more sustainable e-waste practices.

SUMMARY

The study, "Ethnological Insights into the Ecological Hazards of Electronic Waste in Davao City: A Qualitative Study," sought to investigate informal e-waste handling practices, the ecological risks they pose, the role of local government policies, and the community's perceptions of e-waste disposal in Davao City. The study discovered that informal e-waste recyclers, motivated by economic incentives and traditional cultural beliefs, frequently participate in risky methods including burning e-waste to recover precious metals. These methods create substantial environmental concerns, including as air pollution, soil and water contamination, and health risks for both workers and nearby people.

Local government waste management rules are often ineffectual due to inadequate enforcement and a misalignment with local cultural norms that emphasize resource recovery over environmental preservation. Despite being aware of the hazards, homeowners continue to use informal e-waste recycling techniques owing to a lack of convenient, legitimate disposal choices. The survey also discovered that residents and informal workers were concerned about the environmental and health consequences of e-waste but felt restricted by financial limitations and insufficient public education on the subject.

Culturally relevant alternatives were proposed, such as establishing community-based e-waste recycling initiatives and increasing access to safer recycling technology. These ideas would assist to match formal e-waste management processes with local values while minimizing the negative environmental effect.

7. CONCLUSION

This ethnological study conducted in Davao City exposes the concerning unofficial methods that workers and communities use to manage e-waste, which presents serious environmental hazards. The study's conclusions emphasize the need for formal rules, community awareness campaigns, and ethical e-waste recycling methods to reduce the risks related to e-waste disposal. The study pinpoints several important issues and sub-themes, such as the informal economy, environmental risks, and informal practices. Informal repair shops and recyclers use dangerous practices that endanger human health and the environment. Toxic compounds are released into the air, land, and water when e-waste is carelessly

disposed of by burning or dumping, which poses serious health hazards. Additionally, there are no official standards governing Davao City's informal e-waste management sector, leaving workers open to exploitation and restricting their access to social services and money.

To address the ecological risks associated with Davao City's e-waste disposal, the study highlights the necessity of a comprehensive strategy. This entails creating robust policies and laws, educating and raising community awareness, integrating the informal economy with formal waste management systems, and offering resources, training, and legislation to encourage safer and more sustainable activities. Additionally, addressing the lack of formal regulations and enforcement, as well as providing access to capital and social services for informal economy participants, is essential.

The study concludes by emphasizing how urgently Davao City's e-waste disposal poses ecological risks. It is feasible to encourage a safer and more sustainable e-waste management system in the city by adopting a holistic strategy that includes policy, education, and community involvement.

8. RECOMMENDATIONS

Based on the study's findings, the following recommendations are made to enhance e-waste management in Davao City:

Strengthen Policy Enforcement: The local government should improve its enforcement of current e-waste management legislation. This involves more stringent supervision of informal recycling processes and incentives for official recycling procedures. Policies should also encourage safe, sustainable e-waste disposal solutions to lessen reliance on informal techniques.

Cultural Sensitivity in Policy Design: Future e-waste management plans should consider local cultural values, such as resourcefulness and frugality. Implementing community-based e-waste recycling initiatives that include local values may increase compliance and engagement among informal recyclers. For example, establishing a secure platform for resource recovery might aid in reconciling economic and environmental concerns.

Increase Public Awareness and Education: Educational efforts regarding the environmental and health consequences of inappropriate e-waste disposal should be prioritized. These programs should be culturally appropriate and aimed at informal workers, local communities, and enterprises in order to raise awareness and encourage responsible e-waste disposal.

Improve Access to official Recycling Infrastructure: The government should invest in extending official e-waste collection and recycling facilities for all citizens, especially those in low-income regions. Local communities might be encouraged to engage in formal e-waste recycling programs by monetary or material incentives, perhaps reducing informal recycling activities.

Promote Safe and Sustainable Recycling Technologies: Developing cleaner and safer e-waste recycling technologies is critical to reducing the negative environmental effect of e-waste processing. Training informal recyclers in these technologies may result in more sustainable practices that help both the environment and workers' health.

Implementing these recommendations would help Davao City enhance its e-waste management system, decrease environmental and health risks, and connect local practices with long-term waste management plans.

9. REFERENCES

[1] City Government of Davao. (2022). EO 53 reconstitutes Davao City Ecological Solid Waste Management Board. Retrieved from https://www.davaocity.gov.ph:contentReference[oaicite:0]{index=0}

[2] Globe Telecom. (2022). Globe E-Waste Zero: E-waste collection bins. Retrieved from https://www.globe.com.ph/aboutus/sustainability:contentReference[oaicite:1]{index=1}

[3] Villafuerte, C. J. (2022, March 22). E-waste recycling in the Philippines: Challenges and solutions. BusinessMirror. Retrieved from https://businessmirror.com.ph:contentReference[oaicite:2]{index=2}

[4] United Nations University. (2021). Global E-Waste Monitor 2020.

[5] Department of Environment and Natural Resources (DENR). (2022). RA 9003 and RA 6969 Overview.

[6] World Health Organization. (October, 2024). Electronic waste (e-waste). World Health Organization.

[7] Gill,G.N. (2024). Electronic waste. Encyclopaedia Britannica.

[8] United Nations Industrial Development Organization. (2022, October 25). Philippines: Making money, making e-waste safe. United Nations Industrial Development Organization.

[9] Limas, N. M. (2021). A long-standing problem: A review on the solid waste management in the Philippines. Neliti.

[10] TechReset. (n.d.). Solutions to e-waste problems and environmental impacts. TechReset. Retrieved from https://techreset.com/itad-guides/solutions-to-e-waste-problems-and-environmental-impacts/