European Journal of Social Sciences Studies
ISSN: 2501-8590
ISSN-L: 2501-8590
Available on-line at: www.oapub.org/soc

DOI: 10.46827/ejsss.v11i2.1975 Volume 11 | Issue 2 | 2025

THE ENVIRONMENTAL CRIME IN THE PHILIPPINES: A LITERATURE REVIEW

Daisy Jane O. Medrano[1i],
Rowela C. Pecson[2]
[1]RCrim,
University of Mindanao,
Philippines
[2]PhD,
University of Mindanao,
Philippines

Abstract:
This systematic review provided a comprehensive and evidence-based synthesis of environmental crime in the Philippines. It examined the various types, underlying causes, and societal impacts of these offenses. Additionally, the review explored the challenges faced by law enforcement agencies and policymakers in the implementation of relevant environmental laws and regulations. A structured process using PRISMA 2020 was conducted across nine academic databases and two search engines. Studies were screened using predefined inclusion and exclusion criteria. A total of 38 studies were included in the synthesis and analyzed using a thematic descriptive approach. Risk of bias was manually conducted based on five criteria. Results revealed six primary types of environmental crimes: illegal logging, wildlife trafficking, illegal mining, pollution-related crimes, illegal exploitation of aquatic resources, and illegal tourism development within protected areas. Socioeconomic drivers such as poverty, low public awareness, and poor law enforcement, alongside policy gaps, were recurrent themes in environmental crimes. Technological tools such as pXRF and GIS were effective but underutilized, even if they showed great potential in tracing illegally traded wildlife and mapping environmental crime hotspots. Governance failures, limited environmental officers, and educational gaps are major barriers to environmental protection.

Keywords: environmental crime, socioeconomic factors, PRISMA 2020, law enforcement, Philippines

[i] Correspondence: email dmedrano@umindanao.edu.ph, daisyjanemedrano@gmail.com

1. Introduction

The Philippines is renowned for its abundant natural resources and biodiversity, which support both its people and its flora and fauna. However, these country assets face a threat from environmental crimes and violence against those who defend them (Conde, 2024). This research aligns with United Nations (2023) SDG 15 – Life on Land, as it provides a systematic review of existing research about Philippine environmental crimes that directly threaten ecosystems and biodiversity. In addition, it also aligns with SDG 16 – Peace, Justice, and Strong Institutions by promoting accountability of environmental offenders and presenting effective responses towards environmental violations.

Reports from Business Mirror emphasized that environmental crimes in the Philippines are pervasive. It highlighted that even during pandemic, illegal logging continued in protected areas such as the Sierra Madre Mountain range (Business Mirror, 2020a), while illegal mining and quarrying operations in Davao and Cotabato led to the arrest and violation of the mining laws in the country (Business Mirror, 2022; Business Mirror, 2020b). Digital platforms were used by illegal wildlife traders involving endemic species to avoid law enforcement detection (Business Mirror, 2023). Furthermore, the recent shooting of the Philippine Eagle, classified as a critically endangered species, emphasized the poor enforcement of environmental law (Business Mirror, 2024). On the other hand, illegal commercial fishing continued to threaten the marine ecosystem (Business Mirror, 2025), and legal action has been filed for government agencies for the worsening marine plastic pollution (Business Mirror, 2021).

Recent incidents also highlight the growing challenge of enforcing environmental laws and combating environmental crimes in the country. Five Chinese nationals, including 13 Filipinos, were charged with illegal mining in Cagayan De Oro (Asia News Monitor, 2023). Likewise, unauthorized construction of structures in a protected area without permits was charged to four beach resort personnel in Zambales (Manila Bulletin, 2020). In fact, the Philippines faces significant biodiversity loss due to economic pressures and illegal activities like logging and wildlife trade, resulting in over USD1 billion in natural resource loss annually (Caliwan, 2023). Notably, DENR is advocating for the creation of a task force that will enforce environmental laws, but critics argued that addressing the systemic issues, such as flawed environmental regulations, low budget allocation for environmental protection, and government inaction, are the real issues (Business Mirror, 2020c).

The research objective is to provide a comprehensive and evidence-based systematic review of environmental crime in the Philippines. It seeks to identify the various types, causes, and impacts of environmental crimes. This study is urgent given the increasing severity of environmental violations, which continue to endanger our ecosystem despite the existence of regulations. Existing studies are limited in scope and often centered on areas like Luzon. These gaps will hinder a full understanding of the environmental crimes in the Philippines and limit the development of effective evidence-based reforms.

Clifford R. Shaw and Henry D. McKay's Social Disorganization Theory serves as the foundation for this research. It emphasizes how a society can become disorganized as a result of inadequate social structures, little social support, and significant economic instability (Ahadzie, 2023). Boyd (2020) contends that a lack of resources may lead to people committing environmental crimes as a result of social and economic issues, including poverty and residential instability.

One of the supporting theories is the Rational Choice Theory of Cornish and Clarke, which emphasizes that individuals engage in criminal behavior by considering the potential pain and pleasure they may experience from committing an act. Hence, insufficient implementation of environmental regulations heightens the probability of an individual committing environmental crimes, since the benefits surpass the potential consequences (Ceccato, 2022). Another supporting theory that substantiates this claim is the Routine Activities Theory of Cohen and Felson, which emphasizes that crime takes place when three certain elements are present. The persistence of crime is heightened in the absence of a capable guardian, the presence of a motivated perpetrator and a suitable target (Maloku *et al.*, 2024). Environmental crimes are more prone to occur in areas with limited oversight from law enforcement or authorities. Furthermore, those facing socio-economic challenges, such as poverty, are more inclined to participate in environmental crime as a means of improving their life by profiting from these illegal activities.

Crime Pattern Theory (Brantingham & Brantingham, 2021) is a combination of rational choice theory and routine activity theory that suggests place or location is a major factor that attracts and generates crime. In our country, the abundance of natural resources attracts individuals seeking opportunities to extract profit, which may result in illegal means. Environmental crime in the Philippines is influenced by a variety of social, economic, and environmental factors, as explained by Social Disorganization Theory, Rational Choice Theory, Routine Activities Theory, and Crime Pattern Theory. This suggests that a comprehensive strategy is needed that strengthens social institutions, enforces more stringent environmental regulations, boosts law enforcement supervision, and takes into account the geographical patterns of high-crime regions.

The study holds great importance as it offers legislators useful perspectives on how to improve and create environmental laws by determining the gaps in current legislation. This will form the basis for more effective legislation that fights environmental crimes and promotes a safer and more sustainable environment in the Philippines. Law enforcement agencies will also be more equipped to develop strategies for environmental public awareness and law enforcement as a result of the study's enhanced understanding of environmental crimes.

This will help the Philippine government elevate public awareness and successfully handle environmental crimes. It will mobilize support for environmental crime prevention by enabling local communities to take proactive measures in environmental protection. This also provides a solid foundation for future research, allowing scholars and researchers to explore the topic of environmental crime. Importantly, it will promote international cooperation by giving the international

community and organizations a resource to develop policies addressing the global impact of environmental crime. Overall, this will greatly aid in the preservation and protection of the Philippine environment.

2. Method

This study utilized a systematic review guided by PRISMA 2020 framework. Relevant studies were identified through database and manual searches, screened using eligibility criteria, and synthesized using a thematic-descriptive approach. Ethical considerations focused on transparency, as no human participants were involved.

2.1 Research Subject

A total of nine research databases and two search engines are utilized to retrieve relevant studies. Manual search of relevant literature through search engines was also conducted through Google and Google Scholar to provide additional sources not captured in research databases. Search terms such as "environmental crime in the Philippines," "illegal logging", "wildlife trafficking", "illegal mining", “pollution”, "environmental law", “green criminology”, “ecological crime”, “RA 9147”, “RA 8550”, “RA 9003”, “RA 11038” “RA 8749,” “RA 9275,” “RA 7942,” and "environmental enforcement”. Boolean operators (AND, OR) were also used to refine the searches on the academic databases. These include “environmental crime in the Philippines OR environmental law in the Philippines”, “illegal mining AND illegal logging”, “poaching OR illegal hunting”, “environmental law AND environmental crimes”, “environmental enforcement OR environmental crimes”, “ecological crime OR green crime”. Filters were applied to include publications from 2015 to 2025 and English-language studies only to narrow the search.

The data items collected in this research were based on the objectives, and all compatible results were collected and recorded manually in Microsoft Excel. Although 391 records were initially identified, only 38 literatures were accepted as eligible after careful screening and full-text assessment. These eligible studies were synthesized using thematic-descriptive approach to extract information on types, causes, and impacts of environmental crimes.

The eligibility criteria are established to ensure the accuracy of selecting relevant data. The inclusion criteria primarily consist of accessible full-text published studies in English from 2015 to 2025. Eligible literatures includes both local and foreign research that highlights topics on environmental crimes in the Philippines, such as illegal logging, wildlife trafficking, pollution, waste management problems, and illegal mining. Studies that explore the impacts, causes, contributing factors, and challenges pertaining to law enforcement and policies related to environmental crimes are likewise included. The selected literatures are limited to peer-reviewed journals, academic theses or sources, dissertations, systematic or literature reviews, and credible organizational publications. The exclusion criteria primarily removed publications before 2015 and those not written in English. Studies not related to environmental crime, enforcement and policies are

likewise excluded. Non–academic sources, such as editorial pieces, blog posts, personal websites, YouTube videos, podcasts and any unpublished literatures are excluded.

2.2 Materials and Instruments

A self-developed checklist was created and utilized within Microsoft Excel to guide the identification, screening, and extraction of selected studies. This tool was adapted and modified from the PRISMA 2020 to align with the objectives of reviewing environmental crimes in the Philippines. To ensure the quality of the eligible studies, a self-developed risk of bias checklist was also created, allowing the researcher to assess the transparency of each selected study. A self-developed tool was necessary due to the need for contextual judgment in evaluating the specific study 7 on environmental crimes, and no automation tools were utilized as none were available and suitable for the qualitative nature of the study. All extracted and collected data were recorded manually using Microsoft Excel, which provided a flexible and more organized way of synthesizing the selected studies.

2.3 Design and Procedure

This study utilizes a systematic review as a research design, which is helpful in identifying, selecting, and critically appraising existing relevant research on environmental crimes in the Philippines. Unlike traditional literature reviews, it follows a predefined protocol to avoid bias and guarantee comprehensive and reliable findings. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 configuration approach is used as a guide to ensure transparency, replicability, and rigor in the review and selection process of the literature (Page *et al.*, 2021).

A standardized data collection form was employed to organized key information from the relevant literatures. The following information was extracted from each included study: author(s), year of publication, and key findings related to the environmental crime in the Philippines, including its impact, causes, contributing factors, and environmental enforcement and law issues. All data collection was manually and solely done by the researcher, and an initial screening was done to identify possible relevant literature for the research. A comprehensive title and abstract screening was manually done next, based on the predefined inclusion and exclusion criteria, followed by full-text eligibility assessment. All relevant literatures retrieved from the databases was properly documented using Microsoft Excel for organization.

Results were organized in data tables and figures to visually provide a summary of the characteristics of the eligible studies related to environmental crimes in the Philippines. The results were synthesized using a thematic-descriptive approach, which is appropriate for systematic reviews. This method was selected due to the diversity of the available resources, and no sensitivity analysis was conducted due to the qualitative scope of this research. Moreover, the researcher manually screened the eligible literatures through checking its alignment with research objectives, methodological transparency, credibility of the resources, and objectivity. Transparency in data collection and extraction was employed to contribute to the reliability of the synthesized results.

To ensure trustworthiness in this study, a manual screening and extraction process with no automation software was employed, as this study required careful interpretation of selected qualitative data related to environmental crimes. The eligibility criteria were applied consistently, and risk of bias assessment was conducted to guarantee quality on eligible studies for the research. A clear documentation of collected and selected studies was done to serve transparency during the review process.

This study did not have any human participation as it heavily relies on publicly available literature. The University of Mindanao Ethics Review Committee (UMERC) reviewed and approved the study to confirm that it posed minimal ethical risk. Transparent review process, proper citation of identified sources, and adherence to the principle of research integrity were upheld.

3. Results and Discussion

This section presents the findings of the systematic review on environmental crimes in the Philippines. It highlights the study selection process, risk of bias assessment, and thematic-descriptive analysis of the included literature. The types, causes, and impacts of environmental crimes were highlighted to provide a deep insight into this environmental issue.

A total of 391 records were identified through academic databases and search engines. There are 17 duplicate records removed, and 374 records were screened for title and abstract. Meanwhile, there are 294 records excluded due to being non-academic, having an irrelevant topic focus, or being inaccessible. Moreover, 80 full-text records were assessed for eligibility, of which 36 reports were excluded because they either did not focus on environmental crime or were not primarily focused on the Philippines. A total of 44 records underwent the risk of bias assessment, resulting in the exclusion of 6 reports due to being tagged as high risk or moderate risk but not highly relevant to the study. Finally, 38 studies were included in the final synthesis of this systematic review.

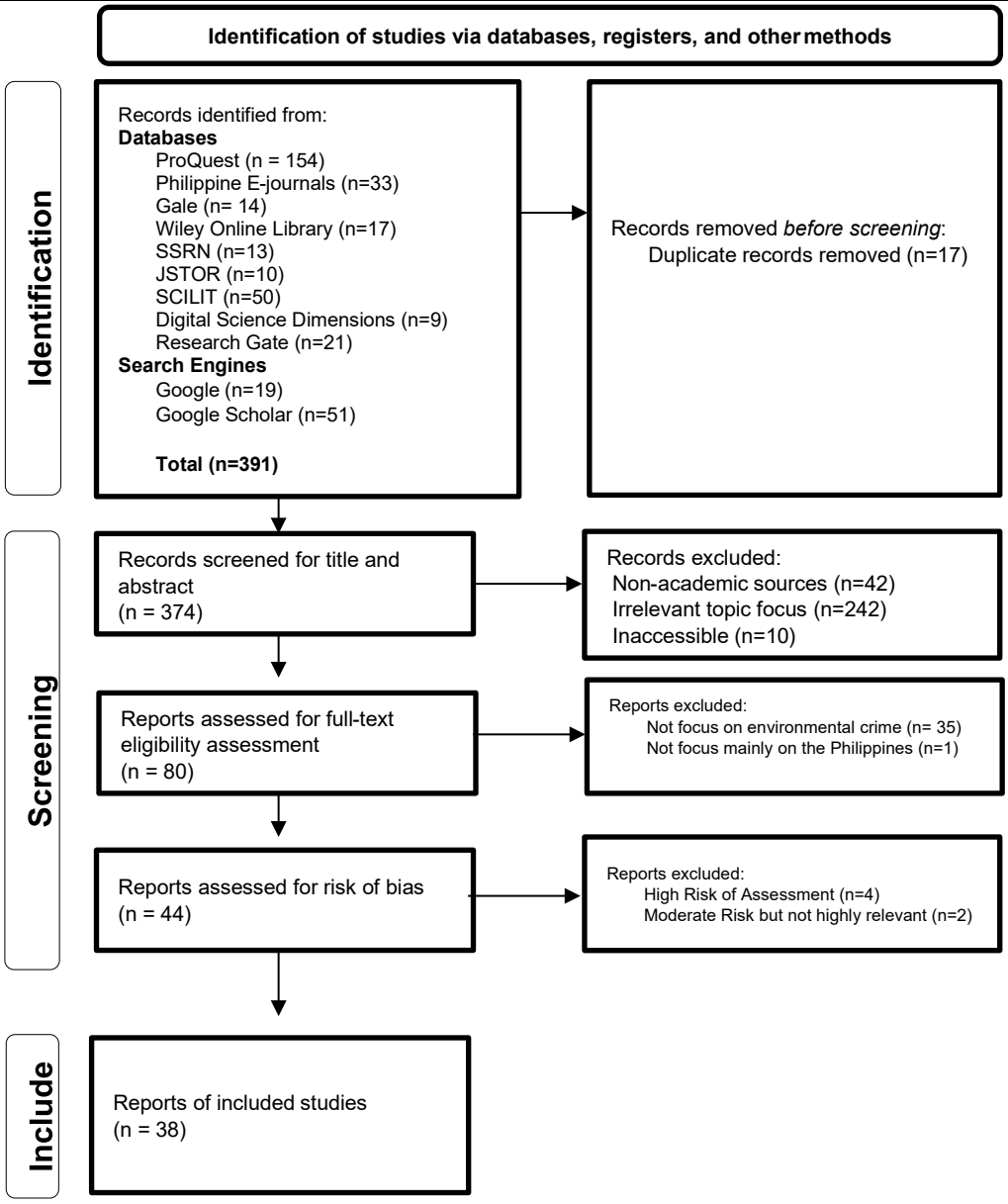

Figure 1: Study Selection Flow Diagram

3.1 Study Risk of Bias Assessment

The researcher solely conducted a simple manual assessment of risk bias using a self-developed tool. These include the alignment with research objectives, methodological transparency, credibility of the resources, objectivity, and regulation and enforcement insights. No automation or software tools were utilized in the assessment of risk bias. All assessments were made manually as the Philippines lacks a clear, legal definition of environmental crime. Studies that scored 13- 15 were tagged as low risk, 11-12 as moderate risk, and 0-10 as high risk. Studies that passed the assessment were considered low risk of bias and were primarily included. Moderate risk studies were not automatically excluded if they included a valuable insight relevant to the research objective, and high-risk studies were excluded.

Table 1: Risk of Bias Assessment Tool

Criteria	Guiding Question	Scoring Scale
1. Alignment	Does the study clearly discuss illegal logging, mining, wildlife trade, pollution, waste management, or other forms of environmental crime in the Philippines?	1 = not related 2 = partly related 3 = directly related
2. Source Credibility	Is the publication from a peer-reviewed journal, academic institution, government agency, or credible organization?	1 = not related 2 = partly related 3 = directly related
3. Methodological Transparency	Are the study's objectives, methods, and analysis clearly explained?	1 = not related 2 = partly related 3 = directly related
4. Objectivity	Does the study avoid exaggerated claims and present findings fairly, with minimal bias?	1 = not related 2 = partly related 3 = directly related
5. Policy and Enforcement Insight	Does the study contribute to knowledge of the law enforcement challenges, legal gaps, or environmental policy implementation?	1 = not related 2 = partly related 3 = directly related

A total of 44 studies were assessed for risk of bias using a manual evaluation tool. Each study was categorized into low, moderate, or high risk based on five criteria: alignment, source credibility, methodological transparency, objectivity and balance, and policy and enforcement insights. As shown in Table 1, the 44 studies are presented by author and year with their corresponding overall risk of bias rating. Moderate risk studies were scrutinized to identify whether they were considered highly relevant to the study.

Table 2: Distribution of Studies according to Types of Environmental Crimes

Types of Environmental Crimes	Number of Studies
Wildlife Trafficking	2
Forest-Related Crimes	4
Pollution-Related Crimes	5
Illegal Exploitation of Aquatic Resources	2
Illegal Mining	2
Illegal Tourism Development in Protected Areas	1

3.2 Types of Environmental Crimes

3.2.1 Wildlife Trafficking

Brandis *et al.* (2023) explored the use of portable X-ray fluorescence (pXRF) and stable isotope analysis (SIA) to determine the origin and status of wildlife in the Philippines, whether it is wild or captive, specifically the Palawan Forest turtle, Philippine cockatoo, and pangolin. The results showed that pXRF models were highly accurate in knowing geographic provenance and source. It offered greater reliability and practical application for field enforcement. This shows that technological innovation can significantly aid in identifying illegal wildlife trade routes and informing enforcement strategies.

Luczon *et al.* (2016) demonstrated the application of DNA barcoding in identifying species from confiscated pangolin remains in the Philippines. It highlights how DNA

barcoding can help in distinguishing between endemic and non-native pangolin, which can enhance wildlife enforcement and detect domestic and international trafficking.

3.2.2 Forest – Related Crimes

Araza *et al.* (2021) identified deforestation hotspots that were found mostly in protected areas and main forest through using Earth observation tools and hotspot mapping. Main causes were due to kaingin, illegal logging, mining, and landslides. Meanwhile, the study of Barit, Choi, and Ko (2022) was able to identify the cause of illegal forest activities in Sierra Madre. Results showed that unauthorized extraction of forest products was the top reason, followed by the conversion of forest into agriculture and infrastructure purposes. Another study shows that slash-and-burn, charcoal making, illegal logging and mining, and forest conversion for infrastructure purposes are also main drivers of forest deforestation and degradation in General Nakar and Rodriguez, using Google Earth Engine and community mapping (Israel *et al.*, 2024). Sarino *et al.* (2023) in their five-year trend analysis study in Misamis Occidental showed that illegal logging and improper waste disposal are the major rising environmental crimes in the area due to weak penalties, poor law enforcement and lack of community awareness.

3.2.3 Pollution–Related Crimes

The case study of Calimon (2024) showed that private individuals from the Tuy River in Batangas commit illegal dumping of chemical waste, which was found to be in violation of Republic Acts 9275, 6969, and 9003. This phenomenon results in pollution leading to the death of fish and aquatic resources, foul smell, and foam formation. It was also observed by Cubos (2023) that crucial environmental violations such as unfiltered sewage emission, uncontrolled development of tourism structures, and degradation of natural features in the Boracay Islands, known to be a prime tourist spot, were prevalent. Another study showed that pollution and high levels of contaminants such as heavy metals and plastics are caused by industrial and agricultural waste, which led to harmful effects to marine and aquatic resources and habitats (Macalisang, Balangao, and Logronio, 2024). Sangil *et al.* (2023) revealed that Santo Tomas, Pampanga faces challenges on persistent improper segregation of waste and limited use of composting, and they emphasized the need for public education to improve implementation of Republic Act 9003. In addition, the findings of Maglucot (2021) showed that college students in Cebu City admitted to doing frequent environmental violations such as littering, burning waste, and wildlife destruction. Main drivers are due to poor law enforcement, lack of media dissemination, limited environmental enforcers and unpopularity of environmental law.

3.2.4 Illegal Exploitation of Aquatic Resources

Tahiluddin & Sarri (2022) argued that unauthorized fishing practices such as dynamite and cyanide fishing, and muro-ami method are still rampant in the country, and key drivers for these illegal acts are due to poverty, weak law enforcement and lack of community engagement. Meanwhile, Pinera *et al.* (2023) assessed the environmental compliance and awareness of coastal communities in Cagayan, where they revealed that

environmental crimes like illegal fishing and aquatic pollution still occurred due to a poor monitoring system and law enforcement gaps.

3.2.5 Illegal Mining

Large-scale and small-scale mining in the Philippines faces issues of illegal small-scale operations, mining pollution, and poor waste management, which result in ecological and health risks (J.P. Domingo *et al.*, 2024). Similarly, Nolos, Zamroni, and Evina (2022) revealed that Palawan Forest degradation is caused mainly by illegal mining, illegal logging, and poaching, which is aggravated by political corruption, overlapping regulations, lack of enforcement, and lack of LGU coordination.

3.2.6 Illegal Tourism Development in Protected Areas

Roa (2024) in his case study scrutinize the development of a resort inside the Chocolate Hills, which is known to be a protected area. It allegedly lacks the Environmental Compliance Certification (ECC) and violates the Republic Act 7586 or the NIPAS Act.

Table 3: Distribution of Studies according to Socioeconomic Drivers for the Commission of Environmental Crimes

Socioeconomic Drivers for Commission of Environmental Crimes	Number of Studies
Weak Law Enforcement and Regulation Gaps	6
Lack of Awareness on Environmental Laws	7
Poverty and Lack of Community Support	3

3.3 Socioeconomic Drivers for Commission of Environmental Crimes

3.3.1 Weak Law Enforcement and Regulation Gaps

Atkinson (2016), in his policy study between the Philippines and ASEAN in terms of environmental governance, assessed that the country continues to struggle with outdated regulations, poor regulation enforcement, and elite-driven policy manipulation. Not only that, Barreda (2022) assessed the implementation of environmental laws such as Republic Act 9275 (Clean Water Act of 2004) and Republic Act 9175 (Chain Saw Act of 2002) and results showed that key challenges are lack of enforcers, political influence, inefficient monitoring systems, and poor agency coordination. Moreover, Premakumara, Gilby, and Kataoka (2016) argue that there are difficulties in the implementation of Republic Act 9003 in Cebu, Santiago, and San Carlos due to limited government budget, land scarcity, and lack of technical capacity. Another study by Coracero *et al.* (2021) showed the same result that solid waste management law continues to fail due to sanitary landfill scarcity, improper disposal among the public, and weak law enforcement. Forest degradation continues to exist despite comprehensive forest regulations due to inefficient law enforcement, prioritizing mining activities, and overlapping forest-related policies, even with extensive legislation. (S.N. Domingo and Manejar, 2019). De Robles, De Leon, and Manapat (2021) underscored that weak environmental policies and dependence on fossil fuels, though they have a significant contribution to the economy, fail to protect our environment.

3.3.2 Lack of Awareness of Environmental Laws

Vanguardia (2023) highlighted that a lack of community awareness, inefficient monitoring systems, limited budget, and public participation result in weak compliance of the Republic Act 9003 (Ecological Solid Waste Management Act of 2000).

Ibañez *et al.* (2023a) highlighted that knowledge and compliance behaviors on environmental laws of future educator students from Cawayan campus reflected significant gaps, where results showed that they have poor environmental awareness, and some still engaged in non-compliant environmental behavior. A separate study of Ibañez *et al.* (2023b) on agriculture students from the same campus showed that they have low environmental law awareness; however, they showed pro-environmental behaviors, and they believed that environmental laws were poorly enforced. Furthermore, according to Ezaki and Vargas (2021) environmental awareness specifically on Republic Acts 9003 (Ecological Solid Waste Management Act), 8749 (Clean Air Act), and 9275 (Clean Water Act) emphasized that students from CNSCLabo campus revealed that students have low environmental awareness compared to faculty and staff who showed high awareness but has difficulties on implementation of such laws. Key drivers of these are due to discipline issues, lack of seminars, and low integration in the curriculum. Dela Cruz *et al.* (2023) assessed the major issues on local implementation of Republic Act 9003 in Minalin, Pampanga, which are known as poor community awareness, lack of enforcement, scarcity of land facilities, and budget constraints. Another study revealed that criminology students from Cabanatuan City lack environmental awareness of brown laws and confessed that they sometimes engage in environmental violations. The main drivers for violations are due to poor media information dissemination, lack of enforcement, and limited enforcement officers (Cariaga *et al.*, 2024). Similarly, Uriarte, Fraile, and Diquito (2021) assessed the awareness of environmental regulations of tricycle drivers in Digos City and found that older and experienced drivers tend to show higher awareness of antipollution laws and waste disposal standards compared to young, experienced drivers who lack knowledge of environmental laws.

3.3.3 Poverty and Lack of Community Support

The study of Noble and Vicente (2023) through a survey among PNP personnel and forest protection officers revealed that forest crimes in Eastern Visayas, such as illegal logging, prevail due to poverty, corruption, low penalties, lack of community engagement, and insufficient law enforcement. Moreover, Celeste (2021) explored that forest guards known as "Bantay-Gubat" experienced difficulties in protecting Mt. Hamiguitan Wildlife Sanctuary due to low salary, lack of community participation, limited personnel, lack of government support, and law enforcement inefficiency. Similarly, Casiw (2020) asserted that residents in Manila estuaries were not aware of their solid waste management violations, and it revealed that the main drivers of these are due to poverty, poor education and values, little community support, and inefficient implementation of Republic Act 9003.

Table 4: Distribution of Studies according to Impacts of Environmental Crime

Impacts of Environmental Crimes	Number of Studies
Environmental Degradation	3
Health Hazard	1
Livelihood Loss	1
Rights Violation	1

3.4 Impacts of Environmental Crimes

3.4.1 Environmental Degradation

This study of Ngilay and Flores (2024) showed a significant finding that commercial quarry operations, particularly in General Santos City, though they give job opportunities it led to environmental impacts such as soil erosion, water pollution, dust emission, and biodiversity loss. This worsens due to weak law enforcement and inefficient community engagement to address this issue. Guimmayen, Cerro, and Vallespin (2024) claim that pollution, unregulated fishing, and climate change led to the coral reef decline, which is known to be a habitat for fish resources. The consequences of these acts may result in biodiversity loss, interruption of livelihood systems to local people, and limited food supply to the population. Palanca–Tan (2018) revealed that small-scale aquaculture led to water pollution, limited local fishing activities and fewer community benefits.

3.4.2 Livelihood Loss

Hifume *et al.* (2024) explored that illegal logging in Calinan, Davao City, is due to governance deficiencies, community negligence, poverty, and overpopulation, which results in disruption in livelihood, habitat loss, flooding, and soil degradation. Weak law enforcement and little community support in addressing environmental violations worsen the situation, leaving the affected community with minimal income sources. Providing alternative livelihoods, raising environmental community awareness, and sustainable forest management strategies will effectively combat the impacts of illegal logging.

3.4.3 Health Hazard

Celestial *et al.* (2018) highlighted that improper waste disposal and open burning results in health hazards as the public are exposed to harmful pollutants. This may lead to skin and organ disease, especially among workers who were exposed to these harmful substances. This creates an urgency to raise community awareness on the safe disposal of waste and recycling practices.

3.4.4 Rights Violation

The issuance of a Writ of Kalikasan in the mining operations happening in Mt. Mantalingahan, Palawan, showed that it caused irreparable environmental damage in a protected area and a violation of indigenous community rights (Go, 2023). This affects the indigenous people's livelihood, cultural rights, and right to a safe environment. The

Supreme Court recognized this situation and emphasized the need to protect cultural and environmental rights.

3.5 Insights Drawn from the Three Thematic Results

This study offers a comprehensive insight into the environmental crime in the Philippines. The findings showed that environmental crimes are diverse and caused by economic, social, and governance structures. This systematic review was able to reveal that the most prominent trends of environmental crimes in the country are illegal logging, wildlife trafficking, illegal mining, pollution-related violations, illegal exploitation of aquatic resources, and illegal tourism development within protected areas.

Notably, the results of the study showed that socioeconomic pressures such as poverty, low public awareness, and lack of alternative livelihoods are primary drivers of environmental crime. This finding is aligned with the theoretical frameworks of this study, such as the routine activity and rational choice theory, which suggests that perpetrators weigh the cost-benefit and opportunity presented. In parallel, Social Disorganization Theory explains further that poor education, weak community structure, and lack of informal social controls create a path where environmental crimes are likely to occur. Outdated policies, political interference, limited law enforcers, and poor agency coordination were findings under the theme of governance failure. This allows environmental crime to persist despite the existence and presence of environmental regulations.

Technological innovations such as portable X-ray fluorescence (pXRF), DNA barcoding, satellite monitoring, and community mapping offered a promising insight into the identification of environmental crimes. These tools are not widely used, especially in local areas, due to limited budget and technical capacity.

The study offered a strong thematic synthesis, but some research shows a lack of a comprehensive methodological process and an absence of a clear link to enforcement outcomes. The predominance of descriptive and cross-sectional designs limits the ability to assess the long-term trends in analyzing environmental crimes. Moreover, most studies are based on well-monitored areas in the Philippines, such as Luzon, and there is little localized research in Mindanao and remote areas. Thus, the imbalance is evident, resulting in limited generalization. In addition, some studies show sampling bias, such as primarily focusing on youth awareness, specifically students, which may not represent a general demographic, and this narrows the understanding of nationwide environmental compliance behavior.

This systematic review followed the PRISMA 2020 framework, and the researcher conducted the review manually without the use of any automation or tools, which may have limited the precision and scope of the search and data extraction process. Additionally, the risk of bias of assessment was manually conducted and may be prone to subjectivity despite creating a structured checklist.

4. Implications and Concluding Remarks

4.1 Implications for Practice, Policy and Future Research

This study strongly advocates for urgent and actionable implications in addressing environmental crimes in the Philippines. There is a need to strengthen localized environmental law enforcement, especially in hotspot areas where illegal activities are rampant, such as illegal logging, overfishing, mining violations, and improper waste dumping. This requires committed funding and sufficient environmental law officers, such as Bantay-Gubat and barangay-level enforcers. Community-based enforcement groups must be empowered and supported by the national government, ensuring that they will also be integrated into the national enforcement framework.

Environmental education should be initiated to promote environmental crime prevention. Community awareness must also highlight the legal consequences of environmental violations, and not only focus on teaching environmental values. Environmental law awareness must be strongly advocated and embedded in primary formal education to ensure that students will develop a sense of environmental citizenship from an early age. High-risk areas where law compliance and awareness are significantly low must be given greater focus in environmental community-based seminars and campaigns. Enforcement agencies in the country must integrate and widely use technological tools that will aid in combating environmental violations, especially in conducting routine monitoring.

Future research should explore the long-term effectiveness of the implementation of environmental law and enforcement mechanisms in both local and urban areas. There is a need for conducting research that tracks compliance rates, behavioral changes, and the impact of environmental law reforms over time. Similarly, investigations must be made on analyzing the role of local governments, the indigenous cultural community, and civilians in preventing environmental crimes. Additionally, comparative studies between regions in the Philippines with high and low rates of environmental violations must be conducted to gain insight into conditions or practices that deter offenses. Lastly, future researchers should evaluate and analyze the integration of emerging technological tools in the daily enforcement and prosecution of environmental crimes.

4.2 Concluding Remark

As a researcher and concerned Filipino citizen, conducting this study has deeply enhanced my understanding of the complexities and realities of the current situation of environmental crimes in the Philippines. I confirmed that environmental violations continue to happen due to poverty, governance failures, and weak law enforcement. It opened my eyes to how urgent we should act upon calling for stronger action, not just in enforcing environmental laws and punishing offenders, but transforming the people's behavior toward the environment. I hope this will inspire future researchers and criminologists to conduct deeper studies that can help address environmental crimes and devise better solutions for the protection of our environment. We must recognise that our environment is our home, and it deserves the same level of focus and urgency as other

forms of crime. Damaging nature is ultimately a threat to our lives, dignity, and the future of our society.

Acknowledgment

I sincerely thank the people whose support and guidance made this study a reality. Your presence throughout this journey meant more than words can express.

This qualitative study would not have been realized without the help and guidance of these exemplary individuals:

Dr. Chavez, Dr. Nabe, Dr. Revisa, Dr. Magbojos, and Dr. Tan, my panellists, whose thoughtful insights and revisions helped shape this study for the better.

Eleanor, Alve, and Laarni, my special colleagues, for the shared support and belief that we could make it through and finish our master's journey.

Most deepest appreciation goes to my thesis adviser, Dr. Rowela Cartin-Pecson, whose mentorship, guidance, and encouragement were instrumental in the completion of this thesis. Her expertise and constant motivation challenged me to strive for excellence and to complete this thesis on time.

Above all, I thank God for his guidance, strength, and grace. His constant reminders and blessings sustained and led me to complete this study.

Danghan Kaayong Salamat

Conflict of Interest Statement

The authors declare no conflicts of interest related to the publication of this research study.

About the Author(s)

Daisy Jane O. Medrano, RCrim, is currently an instructor at the College of Criminal Justice Education, University of Mindanao and a candidate for the Master of Science in Criminal Justice at the Professional Schools, University of Mindanao, Philippines. Since joining the academe in 2022, she has actively participated in trainings, workshop, and seminars in the field of criminology and forensic science and aims to focus her research on issues related to environmental justice.

Rowela C. Pecson, PhD, is a professor at the College of Criminal Justice Education, University of Mindanao, and holds a Doctor of Philosophy in Criminal Justice with a specialization in Criminology from the Professional Schools, University of Mindanao, Philippines. Currently, through her active membership in the Philippine Society of Criminologist and Criminal Justice (PSCCJP), she has been actively participating in seminar training, as the facilitator, in the United States Agency for International Development (USAID) "Seminars and Training for Environmental Crime" in many parts of the country and as, resource speaker and facilitator, United States Department of Justice – Office of Prosecutorial Development and Trainings (OPDAT) "Cybercrime Training of Trainers."

References

4 beach resort personnel in Zambales arrested for violating environmental laws. (2020). Manila Bulletin. https://www.proquest.com/newspapers/4-beach-resortpersonnel-zambales-arrested/docview/2414681167/se-2

Ahadzie, V. A. M. (2023). Exploring How Geographical Location, Trust Among Neighbors, and Trust in Police Impact the Fear of Crime in Ghana: A Test of the Social Disorganization Theory. https://www.proquest.com/dissertationstheses/exploring-how-geographical-location-trust-among/docview/2808179457/se-2

Araza, A., Castillo, G., Buduan, E., Hein, L., Herold, M., Reiche, J., Yaqing, G., Villaluz, M. G., & Razal, R. (2021). Intra-Annual Identification of Local Deforestation Hotspots in the Philippines Using Earth Observation Products. *Forests, 12*(8), 1008. https://doi.org/10.3390/f12081008

Atkinson, C. (2016). National and Regional Environmental Governance: The Philippines Experience with ASEAN. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.4000796

Barit, J., Choi, K., & Ko, D. (2022). Modelling the Risk of Illegal Forest Activity and Its Distribution in the Southeastern Region of the Sierra Madre Mountain Range, Philippines. Iforest, 15, 63-70. https://doi.org/10.3832/ifor3937-014

Barreda, A. (2022). Assessment On the Level of Implementation of Environmental Laws in the Philippines. *International Journal of Innovative Science and Research Technology*, *7*(6). https://www.ijisrt.com/assets/upload/files/ijisrt22jun841.pdf

Boyd, R. C. (2020). Beyond Social Disorganization Theory: The Influence of Multiple Structural Determinants of Crime on an Urban Community. https://www.proquest.com/dissertations-theses/beyond-social-disorganization-theoryinfluence/docview/2420614066/se-2

Brandis, K. J., Meagher, P., Schoppe, S., Zawada, K., Widmann, I., Widmann, P., Dolorosa, R. G., & Francis, R. (2023). Determining the Provenance of Traded Wildlife in the Philippines. *Animals, 13*(13), 2165. https://doi.org/10.3390/ani13132165

Brantingham, P., & Brantingham, P. (2021). Crime Pattern Theory. Oxford Research Encyclopedia of Criminology. https://oxfordre.com/criminology/view/10.1093/acrefore/9780190264079.001.0001/ac refore-9780190264079-e-8

Calimon, J. L. (2024). Case study: Environmental crime in Tuy, Batangas: Illegal chemical dumping. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.4764909

Caliwan, C. L. (2023). Puerto Princesa dubbed "Green Justice Zone" vs. environmental crimes. Philippine News Agency. https://www.pna.gov.ph/articles/1213769

Cariaga, C., Carmen, J.V., Nicolas, W. & Posadas, M. (2024). Awareness And Violation of Brown Laws Among Criminology Students in Cabanatuan City. *EPRA International Journal of Multidisciplinary Research*, 250–253. https://doi.org/10.36713/epra18701

Casiw, G. M. (2020). Revisiting The Ecological Solid Waste Management Program in The Slum Areas of Manila. *International Journal of Advanced Research, 8*(10), 694– 701. https://doi.org/10.21474/ijar01/11892

Ceccato, V. (2022). Rational Choice, Routine Activity and Situational Crime Prevention. Cambridge University Press; Bristol University Press. https://www.cambridge.org/core/books/abs/encyclopedia-of-rural-crime/rationalchoice-routine-activity-and-situational-crime-prevention/DE172784E5A7BBDBF455C4AE4379A888

Celeste, B.L. (2021). Bantay Gubat's Challenges in Protecting Mt. Hamiguitan Wildlife Sanctuary, Davao Oriental, Philippines. Journal of Academic Research. Volume 6. 11-24. https://www.researchgate.net/publication/358116636_Bantay_Gubat%27s_Challenges_in_Protecting_Mt_Hamiguitan_Wildlife_Sanctuary_Davao_Oriental_Philippines

Celestial, R. G. (2018). E-Waste Management in the Philippines. https://doi.org/10.13140/RG.2.2.17965.74728

China/Philippines: 5 Chinese nationals, 13 Filipinos face illegal mining raps in CDO. (2023). Asia News Monitor. https://www.proquest.com/newspapers/chinaphilippines-5-chinese-nationals-13/docview/2814468987/se-2

Conde, C. (2024). Philippines Worst in Asia for Killings of Environmental Defenders. Human Rights Watch. https://www.hrw.org/news/2024/09/12/philippines-worst-asiakillings-environmental-defenders

Coracero, E. E., Gallego, R. J., Frago, K. J. M., & Gonzales, R. J. R. (2021). A Long-Standing Problem: A Review on the Solid Waste Management in the Philippines. *Indonesian Journal of Social and Environmental Issues (IJSEI)*, *2*(3), 213–220. https://doi.org/10.47540/ijsei.v2i3.144

Cubos, A. S. (2023). A case study of environmental violations in Boracay Island. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4656769

De Robles, C. J., De Leon, J. R., & Manapat, C. (2021). Economic Growth at the Expense of Environmental Degradation: Evidence from the Philippines. *Journal of Economics, Finance and Accounting Studies*, *3*(2), 269–287. https://doi.org/10.32996/jefas.2021.3.2.25

Dela Cruz, D., Acuna, G., Aguinaldo, D.C., Aquino, A.M., Jimenez, J., Padua, D.A., Quiroz, R.V., Coronel, C.J., & Tongol, J.V. (2023). *International Journal of Scientific Research and Engineering Development, 6*. https://ijsred.com/volume6/issue4/IJSRED-V6I4P39.pdf

DENR Nabs 14 Suspects for Illegal Quarry Operation in Davao City. (2022). *Business Mirror*. https://www.proquest.com/newspapers/denr-nabs-14suspects-illegal-quarry-operation/docview/2616181110/se-2

DENR stops illegal small-scale mining ops in Magpet, Cotabato. (2020b). Business Mirror. https://www.proquest.com/newspapers/denr-stops-illegal-small-scale-miningops-magpet/docview/2469531450/se-2

Domingo, J. P. T., Jenkin, G. R., Quick, L., Williams, R. D., Hudson-Edwards, K. A., Tortajada, C., Byrne, P., Coulthard, T. J., Padrones, J. T., Crane, R., Gibaga, C. R. L., Vasilopoulos, G., Tungpalan, K., Samaniego, J. O., Biles, E., Tanciongco, A. M., Chambers, J. E., Quimado, M. O., Bautista, A. T., Arcilla, C. A. (2024). Sustainable mining in tropical, biodiverse landscapes: Environmental challenges and opportunities in the archipelagic Philippines. *Journal of Cleaner Production, 468,* 143114. https://doi.org/10.1016/j.jclepro.2024.143114

Domingo, S. N., & Manejar, A. J. A. (2019). Forest Protection in the Philippines: Policy Evolution and Sector Outcomes. Research Paper Series (Philippine Institute for Development Studies), (3), 1-55,57-61, I, III, V-VI, IX. https://www.proquest.com/scholarly-journals/forest-protection-philippines-policyevolution/docview/2335163761/se-2

Ezaki, A. P., & Vargas, D. (2021). Academic Community Awareness and Compliance with Environmental Laws. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3807135

Fighting environmental crime the DENR way. (2020). Business Mirror. https://www.proquest.com/newspapers/fighting-environmental-crime-denrway/docview/2442214674/se-2

Go, M. R. (2023). A Case Study of Illegal Mining in Mt. Mantalingahan, Palawan, Philippines. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4650193

Govt execs face charges for marine plastic pollution. (2021). Business Mirror https://www.proquest.com/newspapers/govt-execs-face-charges-marine-plasticpollution/docview/2546050761/se-2

Guimmayen, S.E., Cerro,P., & Vallespin, M. (2024). Synthesizing the Ecological and Societal Ramifications of Environmental Stressors on Philippine Marine Ecosystems: A Comprehensive Literature Review. *International Journal of Current Science Research and Review. 7*(5) https://doi.org/10.47191/ijcsrr/V7-i5-13

Hifume, A.K., J., Arias, J.M., Lipoles, O. A, & Gempesao, M. (2024). Tackling Illegal Logging: Problems And Challenges. In *American Journal of Humanities and Social Sciences Research* (Pp. 81–94). https://www.ajhssr.com/wpcontent/uploads/2024/05/k248058194.pdf

Ibañez, R. J., Velza, J. F. P., Amit, D. S., & Mahawan, A. M. (2023a). Assessing Environmental Law Awareness Among Bachelor of Elementary Education Students: A Study on Knowledge and Attitudes. *International Journal Of Multidisciplinary: Applied Business and Education Research*, *4*(10), 3507–3515. https://doi.org/10.11594/ijmaber.04.10.06

Ibañez, R., Velza, J., Mahawan, A., Catimpuhan, J., & Gaylan, R. (2023b). Assessment Of Environmental Law Awareness and Pro-Environmental Behavior Among Debesmscat-Cawayan Campus Agriculture Students. https://doi.org/10.2139/ssrn.4918828

Illegal logging in 'protected areas' persists during ECQ. (2020a). Business Mirror. https://www.proquest.com/newspapers/illegal-logging-protected-areas-persistsduring/docview/2407762498/se-2

Israel, K. P. R., Gabriel, M. J. C., Hintural, W. P., & Baldonado, M. M. M. (2024). *Deforestation and Forest Degradation Analysis of Southern Sierra Madre, Philippines Using Google Earth Engine and Community Mapping*. Copernicus GmbH. https://doi.org/10.5194/isprs-archives-xlviii-4-w8-2023-313-2024

Labutap-Noble, A., & B. Vicente, J. (2023). The Implementation of Anti-Illegal Logging Law in Eastern Visayas: An Assessment. *International Multidisciplinary Research Journal*. https://doi.org/10.54476/ioer-imrj/798897

Luczon, A., Ong, P., Quilang, J., & Fontanilla, I. K. (2016). Determining species identity from confiscated pangolin remains using DNA barcoding. Mitochondrial DNA. Part B, *Resources, 1*(1), 763-766. https://doi.org/10.1080/23802359.2016.1238752

Macalisang, J., Balangao, J. K., & Logronio, F. (2024). Environmental Assessment in Panguil and Iligan Bay, Philippines: Review and Future Perspectives. *Journal of Environmental Nanotechnology, 13*(3)(:188-196). https://doi.org/10.13074/Jent.2024.09.243888.fsab

Maglucot, E. (2021). Awareness, Enforcement and Violation of Environmental Crimes Among the College Students of Cebu City. *International Journal of Creative Research Thoughts*, *9*, 2320–2882. https://ijcrt.org/papers/ijcrt2103055.pdf

Maloku, A., Maliqi, R., & Gabela, O. (2024). Application of the Theory of Routine Activities in Criminology to the General Crime Situation in Bosnia and Herzegovina. *Pakistan Journal of Criminology*, 16(02), 669–686. https://www.pjcriminology.com/wp-content/uploads/2024/04/45-Application-of-thetheory-of-routine.pdf

Ngilay, J. L. & Flores, L. V. (2024). Environmental And Socioeconomic Impact Analysis of Quarry Operations in General Santos City on Its Host Communities. *Journal of Interdisciplinary Perspectives, 2*(8), 36-46. https://doi.org/10.69569/jip.2024.0251

Nolos, R. C., Zamroni, A., & Evina, K. F. P. (2023). Drivers of deforestation and forest degradation in Palawan, Philippines: An analysis using Social-Ecological Systems (SES) and Institutional Analysis and Development (IAD) approaches. *Geography Environment Sustainability, 15*(4), 44–56. https://doi.org/10.24057/20719388-2022-081

Online Illegal Wildlife Trade Threatens Endemic Hornbills. (2023). *Business Mirror*. https://www.proquest.com/newspapers/online-illegal-wildlife-trade-threatensendemic/docview/2860032459/se-2

Overfishing pushes the PHL fish stock to the brink of collapse. (2025). Business Mirror. https://www.proquest.com/newspapers/overfishing-pushes-phl-fish-stock-brink-collapse/docview/3179980274/se-2

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinnes, L., Stewart, L., Thomas, J., Tricco, A., Welch, V., Whiting, P. Moher, D. The Prisma 2020 Statement: An Updated Guideline for Reporting Systematic Reviews *Bmj* 2021; 372: N71 https://doi.org/10.1136/bmj.n71

Palanca-Tan, R. (2019). Aquaculture, Poverty and Environment in the Philippines. *The Journal of Social, Political, and Economic Studies, 43*(3), 294-315.

https://www.proquest.com/scholarly-journals/aquaculture-poverty-environmentphilippines/docview/2119862767/se-2

Pinera, J., Pattaui, R., Seguritan, L. C. L., Mazzab, O., Mercado, Ma. T., & Garcia, E. (2023). Knowledge And Compliance with Fishery Laws Among Coastal Communities in Cagayan: A Green Criminology Perspective. *International Journal of Agriculture, Environment and Bioresearch, 8*(3). https://doi.org/10.35410/IJAEB.2023.5825

Poor law enforcement: A driver of biodiversity loss? (2024). Business Mirror. https://www.proquest.com/newspapers/poor-law-enforcement-driver-biodiversityloss/docview/3107699495/se-2

Premakumara, D. G. J., Gilby, S., & Kataoka, Y. (2016). Barriers for the implementation of the Philippine National Solid Waste Management Framework in cities. Institute for Global Environmental Strategies., 33. https://www.iges.or.jp/en/pub/barriersimplementation-philippine-national/en

Roa, J. (2024). *Violation of Environmental Laws: A Case Study of Captain's Peak Garden and Resort in Bohol, Philippines*. https://www.researchgate.net/publication/380819896_violation_of_environmental_la ws_a_case_study_of_captain

Sangil, A., Dimarucut, K., Dumalus, S. M., Tiglao, E.B., Fabian, L. D., Manansala, J.V., Sagmit, J.P., Lim, C.G., Martin, R.R. (2023). Assessment of the Effectiveness of Solid Waste Management in the Municipality of Santo Tomas, Pampanga. *International Journal of Advanced Research, Ideas and Innovations in Technology.* https://www.ijariit.com/manuscript/assessment-of-effectiveness-of-solidwaste-management-in-the-municipality-of-santo-tomas-pampanga/

Sarino, R.,Ong, Butalid, C.I.M., Manilhig, R., Cabilan, W. M. C., & Cuevas, J. F. (2023). Analyzing Five-Year Trends of Environmental Crimes in Misamis Occidental: Basis for Crafting Intervention Plans. *Mediterranean Journal of Basic and Applied Sciences, 07*(02), 147–159. https://doi.org/10.46382/mjbas.2023.7217

Tahiluddin, A., & Sarri, J. (2022). An Overview of Destructive Fishing in the Philippines. *Acta Natura Et Scientia*, *3*(2), 116–125. https://doi.org/10.29329/actanatsci.2022.352.04

United Nations. (2023). The Sustainable Development Goals Report Special edition 2023. https://sdgs.un.org/sites/default/files/2023-07/The-Sustainable-DevelopmentGoals-Report-2023_0.pdf

Uriarte, C. R. M., Fraile, R. Q., & Diquito, T. J. A. (2021). Environmental Regulation Awareness Among Tricycle Drivers in Digos City, Philippines. *European Journal of Education Studies*, *8*(12). https://oapub.org/edu/index.php/ejes/article/view/4066/6700

Vanguardia, S. (2023). Policy Implementation of RA 9003 Ecological Solid Waste Management Act of 2000: An Examination in Barangay Butong. *Dangal Research Refereed Journal, 4*(1)(20–42). https://ejournals.ph/article.php?id=22942