

Improving Forest Management: A Case Study of DENR-CAR's Turned-over Logs

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Abstract. The Department of Environment and Natural Resources in the Cordillera Administrative Region (DENR-CAR) is committed to enhancing sustainable forest management practices, particularly concerning the utilization of turned-over logs derived from Tree Cutting Permits (TCPs). Recognizing the importance of optimizing resource use and minimizing environmental impact, this study examines current policies and practices surrounding these logs, seeking opportunities for improvement and greater efficiency. While existing guidelines, such as DAO 2003-18 and MMO 162, provide a valuable foundation, this research explores how to strengthen implementation further and ensure equitable utilization. A qualitative case study methodology was employed, utilizing semi-structured interviews with key stakeholders, document analysis, and thematic analysis to gather and interpret data effectively. The approach provided in-depth insights into the systemic challenges hindering effective log management, including unclear regulatory definitions, inefficient data tracking, absence of designated custodians, and weak enforcement mechanisms. The study's findings reveal a critical need for policy enhancements encompassing (1) implementing a prepayment mechanism for TCPs to streamline processes and reduce bureaucratic delays, (2) designating barangay Local Government Units (LGUs) as custodians to ensure localized and traceable management, and leveraging technology for efficient data monitoring and decision-making; and (4) fostering community participation in log utilization projects –such as school infrastructure and community development initiatives—ensures equitable benefits while promoting local stewardship. Strengthened monitoring and enforcement mechanisms and capacity building for relevant agencies are also proposed to mitigate non-compliance and resource misuse. This holistic framework offers actionable insights to improve log governance in CAR, promoting transparency, accountability, and technology-driven processes to achieve sustainable forest management and contribute to broader conservation goals.

Keywords: Cordillera Administrative Region; Forest management; Policy enhancement; Tree-cutting permits; Turned-over logs.

1.0 Introduction

Alarming rates of deforestation are in threat of dealing with the very lungs of our planet. Forest resources play a role in maintaining ecological balance, mitigating climate change, and supporting diverse life forms. Globally, the world is losing 10 million hectares of forests yearly (FAO, 2020), with tropical rainforests in regions like South America and Southeast Asia being the most affected. These forests, known for their rich biodiversity and role in carbon sequestration, face threats from agriculture, logging, and infrastructure development. To address these challenges, sustainable forestry methods have been established to manage forests for present and future generations without compromising the ability to meet their needs (Sayo, 2024).

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This study focuses on the sustainable management and disposal of turned-over logs derived from tree-cutting permits (TCPs). These logs, originating from construction projects such as roads, bridges, and flood control initiatives, represent a significant resource that, if managed effectively, can contribute to sustainable development. However, mismanagement of these logs can exacerbate environmental degradation and undermine sustainable forest practices. The research addresses existing policy gaps and proposes a holistic framework for the sustainable management of turned-over logs. This framework will cover economic, environmental, and social dimensions, including equitable allocation of resources, enhanced compliance monitoring, and strengthened enforcement mechanisms to ensure sustainability.

The United Nations Sustainable Development Goals (SDGs) recognize the urgent need for sustainable forest management. SDG 13 (Climate Action) emphasizes combating climate change, mainly through target 13.2, which integrates measures into national policies, strategies, and planning, including nationally determined contributions, long-term strategy, national adaptation plans, and others. SDG 15 (Life on Land) focuses on preserving and sustainably utilizing terrestrial ecosystems, including forests. This goal aligns with target 15.2 to promote the sustainable management of forests, combat desertification, halt and reverse land degradation, and ensure land restoration and forest regeneration (United Nations, n.d.). By managing turned-over logs, the government can contribute to achieving these targets and promoting sustainable forest management practices.

The Philippines, once a lush rainforest, is no exception. An essential component of forest management that many should have considered involves the disposal of turned-over logs from tree-cutting permits (TCPs). If not disposed of responsibly, these logs can contribute to environmental degradation and hinder efforts towards sustainable forest management. The Department of Environment and Natural Resources (DENR), the primary agency responsible for overseeing environmental resources—including the disposal of turned-over logs from issued tree-cutting permits—plays a crucial role. Recognizing the importance of proper forest product management, former President Fidel V. Ramos issued Malacañang Memorandum Order (MMO) No. 162 on August 19, 1993. This order provides guidelines for disposing of confiscated logs, lumber, and other forest products for public infrastructure projects. However, MMO 162 excludes turned-over logs from TCPs, creating a considerable policy gap that undermines sustainable forest management efforts. This omission leaves a critical resource unregulated, potentially exacerbating environmental degradation and reducing the opportunity to maximize these logs' economic and ecological value. Addressing this policy gap is crucial for ensuring the responsible use and equitable allocation of forest resources.

DENR Department Order No. 18, series of 2003, aimed to address this gap by guiding the donation of confiscated forest products, including those turned over to the DENR, such as logs covered by Cutting or Road Right of Way Permits. Despite these efforts, significant challenges remain, including (a) the need for clear and enforceable guidelines, (b) weak enforcement mechanisms, and (c) inefficient data management. These challenges have severe consequences, such as environmental degradation, economic losses, and social inequity. For instance, in regions where policies are unclear, uncontrolled deforestation has destroyed biodiversity-rich habitats, resulting in the extinction of species and the loss of ecosystem services. Additionally, poor log management has caused financial losses for local economies that could otherwise benefit from the sustainable use of these resources, as seen in areas where turned-over logs were mismanaged and wasted. Socially, the inequitable distribution of forest resources has disproportionately affected marginalized communities, denying them access to sustainable livelihoods and increasing their vulnerability to climate impacts.

This study seeks to bridge these gaps by proposing a comprehensive framework for managing turned-over logs that emphasizes economic value, environmental sustainability, and equitable resource allocation. This framework aligns with national and international standards and contributes to sustainable forest management by improving policy implementation, enforcement, and compliance monitoring.

The literature highlights the importance of sustainable forest management and disposal of turned-over logs. Adherence to management regulations is critical to achieving sustainable forest management objectives (Ankomah et al., 2022). Proper management requires clear and well-defined regulations to maintain ecological balance. Research demonstrates that the lack of enforceable guidelines for turned-over logs undermines

sustainable forest practices, as observed in the Cordillera Administrative Region (CAR). Erbaugh et al. (2020) emphasize forest landscape restoration, where local communities manage and restore forests, as a promising approach to aligning global agendas for climate mitigation, conservation, and sustainable development. This perspective supports the argument for properly managing turned-over logs to enhance forest ecosystem health in CAR. Additionally, Sotoudeh et al. (2021) argue that well-designed policies can foster ecological preservation and equity.

The sustainable disposal of turned-over logs from TCPs is essential for forest resource management, especially in regions facing increased deforestation and environmental degradation. While specific research on challenges and opportunities related to turned-over log management in the Philippines is limited, insights from global studies offer valuable guidance. Studies from Southeast Asia, particularly Thailand, Indonesia, and the Philippines, highlight the ineffectiveness of forest rehabilitation policies due to insufficient consideration of local contexts. These challenges include unclear forest boundaries, weak network structures, and ineffective leadership (Sharma, 2021). Effective forest management requires strong regulatory frameworks to address policy gaps and curb illegal logging. These frameworks should consider the unique challenges posed by turned-over logs and tailoring solutions to promote sustainability and equitable resource use. For instance, regions with well-defined policies, such as community-managed forest initiatives, have shown that integrating economic incentives with strict monitoring mechanisms can mitigate illegal logging while fostering sustainable practices. Involving local communities in decision-making processes and equitable benefit-sharing can promote sustainable practices and reduce deforestation (Uisso et al., 2023; Diansyah et al., 2021). Technological advancements can improve monitoring and enforcement (Hifume et al., 2024; Acuti et al., 2023). Furthermore, integrating Indigenous communities in forest conservation and climate change mitigation through their knowledge and practices may be fundamental in developing sustainable strategies for forest management (World Bank, 2023; Moutinho et al., 2022). These insights can guide the Philippines in developing sustainable strategies for disposing of turned-over logs and managing forest resources.

While existing research underscores the importance of sustainable forest management, there is a notable gap in addressing the specific challenges related to the management and disposal of turned-over logs from TCPs in the Philippines. This study addresses this gap by analyzing current policies, identifying challenges, and proposing strategies for improvement. By focusing on the sustainable disposal of turned-over logs, this research contributes to broader efforts to mitigate deforestation and promote sustainable forest management.

This study aims to develop a comprehensive policy framework for the sustainable management and disposal of turned-over logs from TCPs. This framework will address key components such as efficient resource allocation, robust compliance monitoring mechanisms, equitable benefit-sharing strategies, and the integration of technological innovations to enhance transparency and enforcement. This framework aims to improve existing guidelines, address implementation challenges, and promote transparency and accountability. By doing so, the study contributes to achieving national sustainable forestry goals and aligns with UN SDGs 13 (Climate Action) and 15 (Life on Land).

This research is significant in several ways. It addresses critical policy gaps by offering a data-driven framework for the sustainable disposal of turned-over logs. Policymakers can use these findings to develop effective regulations that balance environmental protection, economic viability, and social equity. For example, they could establish a program requiring turned-over logs in public infrastructure projects, such as community housing or schools, ensuring resource efficiency while reducing the environmental impact of new logging activities. The study provides valuable insights for environmental agencies to improve policy implementation and enforcement. The forestry sector can benefit from recommendations on responsible timber sourcing and sustainable log utilization. Ultimately, this research supports national sustainable forestry goals and contributes to global efforts to combat climate change and promote biodiversity conservation.

2.0 Methodology

2.1 Research Design

This study employed a qualitative research design, precisely a multiple case study approach. A multiple case study design is an in-depth exploration of a specific phenomenon within its real-life context, drawing insights

from several distinct cases to identify commonalities, differences, and patterns (Yin, 2018). This methodology is particularly suitable for investigating complex issues like managing and disposing of turned-over logs from tree-cutting permits, as it allows for a comprehensive analysis of various perspectives and practices. By examining multiple cases, this design provides a robust understanding of the phenomenon while enhancing the generalizability of findings through cross-case comparisons (Stake, 2006). The combination of document analysis and interviews in this research ensures a holistic approach to addressing the policy gaps and proposing practical recommendations.

2.2 Research Locale

The case study focused on the Cordillera Administrative Region. Although the findings give a good insight into the challenges and opportunities for sustainable turned-over log management in CAR, it may have to be more generalizable to other regions in the Philippines with different contexts. Furthermore, the availability of participants and bias may limit data collection. This research explored common challenges, best practices, and possible solutions through this in-depth comparative analysis of sustainable log management.

2.3 Research Participants

This study involved 11 participants, selected based on their direct involvement and expertise in managing and monitoring turned-over logs derived from tree-cutting permits. The participants included Community Environment and Natural Resources Officers (CENROs) and ten DENR field personnel responsible for monitoring compliance of the disposal of turned-over logs. Inclusion criteria required participants to have at least three years of experience managing or monitoring tree-cutting permits involving turned-over logs. Exclusion criteria ruled out individuals with limited experience in forest resource management or those not directly engaged in related policies. These participants were considered unique cases due to their specialized roles in overseeing critical aspects of tree-cutting permits, such as compliance monitoring and resource allocation, providing diverse insights into the challenges and opportunities in sustainable log management.

2.4 Research Instrument

The primary data collection methods included semi-structured interviews and document analysis. Semi-structured interviews were conducted using an interview guide with open-ended questions tailored to elicit detailed responses about the participants' experiences and perspectives. Sample questions included: *"What are the key challenges or limitations you have encountered or observed in the existing policies to the management and disposition of turned-over logs from tree-cutting permits?"* *"What specific policy enhancements or new guidelines would you recommend to improve the management of turned-over logs?"* and *"How can a data-driven, comprehensive policy framework improve compliance monitoring for the disposal of turned-over logs?"* These questions were designed to gather insights into the effectiveness of existing policies, identify gaps, and explore potential solutions. The document analysis involved reviewing policy documents, guidelines and reports on tree-cutting permits and turned-over logs to identify inconsistencies, gaps, and best practices.

2.5 Data Gathering Procedures

Data gathering was conducted over two months, from October to November 2024. The modality of data collection included face-to-face interviews where possible and virtual interviews for participants in remote locations. Before the data collection, formal letters of consent were sent to the DENR regional office to obtain permission for the study. Once approval was granted, participants were informed to participate by phone. Each interview lasted approximately 60–120 minutes and was recorded with the participant's consent for transcription and analysis. Document analysis was conducted concurrently, focusing on relevant policy documents, memoranda, and reports provided by DENR offices. The collected data were subjected to thematic analysis to identify recurring themes, patterns, and variations across the cases. The iterative data collection and analysis process continued until data saturation was achieved, ensuring the findings were comprehensive and deeply informed.

2.6 Ethical considerations

Before the interview, a consent letter was secured from the DENR department head. The purpose of the study was clearly explained to them so that they knew why the study was conducted and their rights as participants. To protect the confidentiality and anonymity of the participants, the research aimed to reduce potential harm and ensure their voices were heard in the findings. The participants were assured of the confidentiality of their

responses and that the published findings would not attribute a specific statement to an individual without explicit consent.

3.0 Results and Discussion

This case study outlines significant challenges and opportunities in managing and disposing of turned-over logs from tree-cutting permits. These challenges include a need for more precise policy guidelines, inadequate enforcement, efficient data management, and the absence of a designated custodian.

3.1 Current Practices and Challenges

Lack of Clear Guidelines

A fundamental weakness is the absence of a comprehensive policy addressing the tracking and disposal of turned-over logs. While MMO 162 provides guidance for confiscated forest products, it lacks the necessary specificity for these resources, creating a significant regulatory gap. This ambiguity, as emphasized by the Guardian of the Forests, can lead to further environmental degradation, including illegal logging and encroachments:

“The MMO 162 provides guidelines for the prioritization and requirements of the disposition of confiscated forest products. However, it lacks specific guidelines for handling turned-over logs, leaving a significant gap in the regulatory framework for managing these valuable resources. This can further lead to mismanagement of turned-over logs and may lead to further environmental degradation, such as illegal logging or encroachments.”

DAO 2003-18 indicates that the disposal of retrieved or turn-over forest products to the DENR aligns with MMO 162. However, this order needs more clarity and specific provisions for disposing of turned-over logs. This deficiency impedes effective monitoring, accountability, and equitable distribution. As the Guardian of the Forests stressed, the need for:

“Revise ambiguous provisions to ensure uniform interpretation and implementation across all DENR offices. Develop detailed standard operating procedures (SOPs) for the inventory, transport, and disposition of turned-over logs. Ensure that a portion of the revenue from the disposition of logs benefits affected communities, especially indigenous groups. Tie tree-cutting permits and the use of turned-over logs to reforestation or conservation projects.”

This lack of clarity can lead to disputes regarding ownership and utilization between local government units (LGUs), indigenous peoples, communities, and the DENR. As Nuesiri (2022) notes, clear regulations are crucial, but implementation and enforcement are equally complex, often hindered by capacity, resources, and political will. Furthermore, as Ankomah et al. (2022) highlight, regulatory gaps create opportunities for misuse, undermining sustainable forest management. This is compounded by corruption and low transparency, which participants repeatedly cited as significant obstacles.

Inefficient Data Management and No Designated Custodian

The absence of a designated custodian for turned-over logs creates a critical accountability gap. As Robinson (2021) states, the concept of environmental subjectivity conveys that identity, power, and access to resources are all intertwined. A designated custodian, particularly at the local level (e.g., barangay LGUs), would facilitate direct accountability and promote community-based resource management, mitigating conflicts and fostering sustainability, as emphasized by the Guardian of the Forests:

“No custodian means there will be no accountability for these resources. Lack of accountability can lead to mismanagement, illegal cutting, and corruption, defeating the very purpose of conservation of these forests and conservation with sustainable use. Designating a custodian for the turned-over logs would ensure proper tracking, storage, and utilization to reduce the risk of diversion and misuse.”

This aligns with Dawson et al.'s (2021) argument that empowering Indigenous Peoples and local communities to lead conservation efforts is crucial for effective and equitable environmental protection. Coupled with the lack of a custodian is inefficient data management, which hinders effective oversight and can lead to corrupt decision-making. As Stoyanovich et al. (2020) emphasize, responsible data management is crucial for ethical and practical Automated Decision Systems (ADS), which rely increasingly on data to make decisions, depends on responsible

data management. Accurate, reliable, and unbiased decisions that might be taken in the forest management process would be assisted by responsible data management. Data governance practices like data quality assurance, data privacy, and data security would forestall the risks resulting from harmful data management practices for the sustainable usage of forest resources. The Guardian of the Forests highlighted the need for robust tracking systems:

"We need systems to track logs from origin to disposal. Technology is available, but rural connectivity is a challenge."

While technologies like sensor technology and autonomous robots (Ehrlich-Sommer et al., 2023) and ADS applications like satellite monitoring offer significant potential, addressing fundamental issues like rural internet connectivity is essential. Implementing automated decision systems (ADS) can improve efficiency, but responsible data management practices are crucial to avoid unintended consequences. ADS are systems of algorithms that make decisions based on data with very little significant human intervention. ADS can be applied in forest management to detect illegal deforestation through satellite imagery, predict the spread of forest fires, or optimize timber harvesting operations. The inputs of such systems must be accurate, unbiased, and representative of the complex ecological and social factors that occur in forest ecosystems.

Challenges in Monitoring and Enforcement

Poor monitoring and lack of enforcement mechanisms contribute to non-compliance with permit conditions. Limited personnel and resources are required for effective monitoring and inspections. Weak governance, involving, among other things, political interference, corruption, and capacity constraint, further exacerbates these challenges. As emphasized by the Guardian of the Forests and Officer Silva:

"Limited personnel and resources make it difficult to monitor and inspect compliance with permit conditions promptly and properly dispose of turned-over logs, increasing the risk of non-compliance, illegal cutting, and poor forest resources management."

Weak monitoring systems are some of the factors that contribute to non-compliance with conditions of issued permits. Strong partnerships between law enforcement agencies and local governments can enhance the effectiveness of forest resource monitoring systems. According to Awolorinke et al. (2023), political interference will interfere with effectively regulating and protecting ecologically sensitive areas, including forest management. Other factors, such as corruption, capacity constraints, and resource limitations, might lead to weak governance. Also, Basu et al. (2023) identify that weak enforcement due to weak forest administration and indulgence of political parties by illegal encroachers has resulted in poverty-driven illegal logging, which has led to increasing deforestation and forest degradation.

Strengthening regulatory frameworks, investing in enforcement capacity, and promoting transparency and accountability can address such concerns. Sustainable forest management and conservation opportunities can be fostered through collaboration between government agencies, local communities, and civil society organizations.

3.2 Policy Enhancement and Improvement

To address these challenges, several key policy enhancements are recommended. Such recommendations include developing comprehensive guidelines for the disposition of turned-over logs that may have precise definitions, procedures, and accountability mechanisms for the system. Implement a payment system for logs derived from TCPs to expedite the process with responsible utilization. A capacity-building activity for barangay LGUs is to empower them to manage the disposal of logs for local projects. To involve the communities in the decision-making process and consider allocating turned-over logs for local projects to promote social equity and sustainability. Invest in enforcement capacity, including personnel and resources, to ensure compliance with regulations and guidelines. Implement robust monitoring systems and penalties for non-compliance. Implement sound monitoring systems and penalties to punish offenders. Data management utilization in monitoring through available technologies is bound to increase efficiency and transparency. However, areas with slow internet connectivity still need to be improved for data collection and subsequent analysis.

Payment Mechanism

The payment mechanism will streamline the process, ease the procedures, and reduce red tape in bureaucratic procedures. According to Basu et al. (2023), formulating effective forest governance policies, such as payments for ecosystem services, will also promote the sustainable use and management of forest resources. After a TCP is issued and an inventory of trees to be cut is completed, its value will be assessed, and a payment amount will be determined. Prepaying for logs can accelerate the process and empower barangay LGUs to manage the disposal of timber, promoting sustainable resource management and community development. Responsible usage can be granted by giving these logs by empowering the barangay LGUs to manage its disposal or through other appropriate community projects, wherein school infrastructure or furniture and fixtures are within the jurisdiction of the barangay jurisdiction only. Limiting the use of these logs to the barangay where they originated will ensure local benefits and prevent misuse, as emphasized by the Guardian of the Forests:

“The best way is to adopt the payment of the logs to lessen the process (red tape). Establish clear and uniform pricing standards for turned-over logs based on species, size, quality, and market conditions. Review and update log pricing schedules periodically to reflect current market values.”

Moreover, limiting the use of logs in the barangay will ensure that the benefits go directly to the local community and avoid potential conflicts or misuse. As emphasized by the Guardian of the Forests:

“If payment is adopted, the utilization of these logs/lumber should be limited in the barangay where the tree was cut or harvested.”

A well-thought-out payment system can make the bureaucratic process more streamlined through automation, such as permit issuance, inventory calculations, receipt generation, tracking of payments, and permit approval, thereby reducing excessive paperwork and manual processing. Latupeirissa et al. (2024) emphasize the role of digital technologies in streamlining government processes. For example, a study by the United Nations (2022) highlights how digital government initiatives, including automated payment systems, can improve efficiency and reduce administrative burdens. A transparent payment system can also negate corruption and properly utilize funds. The valuation guidelines can also be updated regularly to reflect current market prices and timber quality, ensuring fair compensation for logs and preventing losses for the government. For instance, a report by the World Bank (2020) emphasizes the need for accurate pricing mechanisms in environmental management to ensure efficient resource allocation and prevent undervaluation.

Empowering Barangay Local Government Unit (LGU) as Custodians

The guidelines may prioritize beneficiaries, considering the barangay LGU where the trees were cut or harvested. The Philippines places cultural values on forests, but more importantly, for Cordilleras, forests have been collectively owned and managed by the local communities using customary practices, and forests are considered essential and contiguous resources. These practices can be integrated into official processes to ensure sustainable forest management (Abayao, 2021). Unlike confiscated forest products, which often prioritized DepEd and other agencies, such unique circumstances of turned-over logs may require different considerations. A policy could grant barangay LGUs authority to utilize or dispose of the turned-over logs for local projects, such as schools or government initiatives, within the particular barangay jurisdiction. This policy empowers barangay LGUs and promotes local ownership, community development, and sustainable forest management. As emphasized by the Guardian of the Forests:

“The prioritization to utilize the logs should consider the barangay Local Government Unit or the authority to dispose of the logs from cutting permit issued to DPWH and other government agencies. Moreover, clearly outline the roles and responsibilities of each stakeholder (e.g., DENR officials, LGUs, contractors, log buyers, and community representatives) in managing logs. Require formal agreements that specify duties, deliverables, and penalties for non-compliance.”

Streamlining the Disposition Process

Simplifying and streamlining any process will avoid red tape, reduce bureaucratic delays, and expedite the process. As Rahmi and Wijaya (2022) mentioned, bureaucracy simplification is a critical component of bureaucratic reform, aiming to improve public service delivery and make bureaucracies more dynamic and

efficient. By streamlining processes and reducing unnecessary red tape, governments can enhance their responsiveness to citizens' needs and improve overall governance. As emphasized by Officer Silva:

“To mitigate waste and maximize the economic value of logs,’ most especially for immediate needs such as during calamities, efficient processing methods should be implemented.”

To streamline the disposition process for turned-over logs, centralizing the clearance authority under the Provincial Environment and Natural Resources Officers (PENROs) could be considered. The regional office could then implement strict monitoring to ensure all disposition processes comply with regulations and standards.

Strengthening Monitoring and Enforcement

Invest in robust data management systems to track the volume, origin, and disposition of turned-over logs. Implement strict penalties for non-compliance and leverage technology (e.g., digital tags, QR codes, RFID chips) for real-time tracking and traceability. Of course, technology can significantly improve monitoring and data management, but internet connectivity in rural areas must be addressed. As Mondejar et al. (2021) have noted, digitalization can contribute to sustainable manufacturing and increase access to healthcare for the marginalized. It can also affect global efforts toward climate change and biodiversity loss. As emphasized by the Guardian of the Forests:

“Impose strict fines, suspensions, or legal actions against violators, including DENR personnel, private entities, or buyers. Also, technology can revolutionize the way logs are managed, tracked, and disposed of. Key technological interventions include attaching digital tags to logs for real-time movement and location tracking. Further, using QR codes or RFID chips to ensure traceability throughout their lifecycle. Conduct periodic third-party audits to verify log inventories and reconcile records with on-ground data.”

Strengthening community engagement with the supervision of the higher authorities can be one way to strengthen monitoring and enforcement of forest activities and reporting illegal activities; this can enhance surveillance efforts. A balanced approach to monitoring, combining top-down accountability with community engagement (Kahsay et al., 2023), is crucial for effective and sustainable forest management. Addressing internet connectivity issues in rural areas is also essential to fully realize the potential of technology in data management and monitoring.

4.0 Conclusion

The case study has exposed several critical challenges in the sustainable management of turned-over logs in the Cordillera Administrative Region, hindering sustainable forestry practices. A significant challenge in this regard is the need for clear and enforceable guidelines for the proper disposition of logs, which causes confusion and makes stakeholders accountable. Weak enforcement mechanisms limit effective monitoring and compliance with TCP conditions because of an insufficient workforce and resources. These findings agree with research studies by Ankomah et al. (2022), who assert that compliance with regulations is essential for sustainable forest management goals.

The lack of adequate data management systems to track the volumes, origins, and dispositions of the turned-over logs means less informed decisions. These results align with Stoyanovich et al. (2020), who highlight the importance of responsible data management for effective resource governance. Addressing these challenges is crucial for promoting sustainable forestry practices and achieving national and international environmental goals.

The study's implications highlight the urgent need for policy enhancements such as a multi-pronged approach encompassing (1) developing comprehensive and enforceable guidelines for all stages of log management, from inventory to disposal; (2) streamlining procedures, including implementing a prepayment system for logs derived from TCPs; (3) empowering barangay LGUs as custodians to foster local ownership and accountability; (4) investing in robust, technology-driven data management and monitoring systems, addressing existing connectivity challenges; and (5) strengthening enforcement capacity and promoting community involvement.

These recommendations, if implemented, will transform DENR-CAR towards an efficient and more sustainable system of managing turned-over logs into responsible utilization of forest resources, accountability of stakeholders, and contributing to the goals of achieving national sustainable forestry goals. The study proposes the integration of technology into data management and tracking systems. A technology-based system could increase efficiency and save costs in the long run. More importantly, it would enhance analysis capabilities while providing informed decision-making and improved monitoring of turned-over log disposition. Ultimately, the proposed policy recommendations shall focus on developing clear and enforceable guidelines, streamlined processes, and a payment system that could significantly impact CAR's sustainable forestry management efforts. These changes would promote transparency, accountability, and responsible utilization of forest resources.

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6.0 Conflict of Interest

The author has no conflict of interest to declare that they are relevant to the content of this research.

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