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Socio-Environmental Approach in the Clearing of Road Right-of-Way Obstruction by the Department of Public Works and Highways 2nd District of Albay

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Abstract

The road right-of-way (RROW) obstruction removal is critical for improving traffic mobility, safety, and infrastructure resilience. However, clearing operations often face socio-environmental approaches shortcomings which require balanced sustainability approaches beyond conventional engineering solutions. The study aimed to: 1) Identify the classification and documentation of national RROW obstruction by the DPWH 2nd District of Albay; 2) Determine the current socio-environmental practices applied by the DPWH 2nd District of Albay, and existing short comings in the removal of obstruction; 3) Determine the measures adapted to address the shortcomings encountered in the removal of obstructions; and 4) Propose engineering integrated solutions that incorporate socio-environmental considerations in the clearing process. The study utilized a mixed descriptive type of research with quantitative approach using survey questionnaires and qualitative approach using semi-structured interview guide for those involved in the clearing of road obstruction operations. Whereas documentary analysis is also included. Findings of the study showed that road obstructions cleared from calendar year (cy) 2023 - 2025 are those from category A which includes the unfixed objects such as construction materials, lumber, debris, and etc. followed by category C (temporary structures), which consist of building, house, shanty, and etc. As well as long term obstructions, such as stall, canopy, small billboards, small signage, and etc.

In evaluating the current practices in the road right-of-way obstruction removal with respect on its social and environmental approaches, the customary practices such as the assuredness of the procedures in environmental impact assessment, road obstruction removal, containing & controlling of waste materials, issuance of notice, reports & monitoring, awareness campaigns, and conservation of tree planting. In determining the shortcomings in the road right-of-way obstruction removal regarding to social and environmental aspects, common patterns such as the requirements in environmental impact assessment & environmental compliance certificate, demolition, training, coordination and cooperation between the concerned entities including the participation of local government unit, and submission of documents. However, shortcomings are experienced, such as lack of cooperation, lack of training to those involved in the operation on road obstruction removal, and funds are usually delayed in its releases. Furthermore, measures are adapted to address these shortcomings in terms of social approach, such as notices are disseminated on time say about 3 days before the meeting date, awareness campaigns

should frequently be done to saturate stakeholders' participation and get their cooperation and participation, training programs should be conducted to those involved to update them on the considerations to be undertaken for more effective and efficient performance, and funds be allocated and release on time. And measures to address these short comings in terms of environmental approach, such as the EIA shall be incorporated by big or small activities, vibration of Equipment's shall be minimized, and equipment or vehicles shall be properly equipped for the removal of obstruction. Engineering-based solutions are proposed to integrate the socio-environmental approaches in the sustainability of clearing of obstructions.

Keywords: Socio-environmental; right-of-way; sustainability approach

1. Introduction

This study focused on the socio-environmental approaches in the clearing of national road right-of-way obstructions by the Department of Public Works and Highways (DPWH) 2nd District of Albay. The road obstructions removal often faces significant gaps in adopting a holistic socio-environmental approach. This study explored the socio - environmental approaches in the removal of obstruction being handled by the office concerned and what could be done to improve such approaches to attained sustainable road network in which users could be safe and protected. The DPWH employs in its social environmental management systems (DO. 159, series of 2015) which adapted the procedural guides or the EIA process under PD 1586. Furthermore, the engineering solutions are proposed to improve the sustainability in the clearing of road obstruction. Moreover, current socio-environmental practices being performed address its shortcomings and measures are adapted to address the shortcomings. Road Right-of-Way (RROW) that prioritizes public safety, stakeholder consultation, and legal compliance, aiming for voluntary compliance before enforcing mandatory removal. This approach is guided by Department Order No. 73, Series of 2014, which mandates clearing national roads to ensure safer travel. In addition, the Department of Public Works and Highways (DPWH) employ an environmental approach to removing obstructions within the Road Right-of-Way (RROW) by integrating ecological considerations, strict waste management, and legal compliance with environmental laws, primarily through Department Order No. 73, series of 2014, and environmental management frameworks.

Background

Roads enable the movement of people and goods, forming a vital link between origins and destinations. They are fundamental to our everyday lives, propelling economic progress and transforming the way we travel. The building, upkeep, and restoration of roads, however, led to significant environmental and social issues. The removal of obstructions, including materials, structures, and other impediments, from the right-of-way before and after road construction has consistently presented challenges in ensuring the safety, orderliness, and cleanliness for users, as well as the overall functionality of the roadway. The poorly planned road and bad practice in construction maintenance and rehabilitation have reaching and negative effects resulting in damages; in many causes are permanent. These damages may hamper benefits of facilitated leakages, enhancement of mobility and improved access. Road right-of-way obstruction in the Albay 2nd district is a major infrastructural legal challenge, primarily driven by illegal encroachment, weak enforcement, and poor coordination between government agencies and utility companies. The social aspect involved in clearing obstacles from the road right-of-way by the DPWH is an organized procedure aimed at reconciling the safety of infrastructure with the well-being of impacted

communities and businesses. The emphasis is placed on ensuring compliance, coordinating with local government units, and mitigating the repercussions of displacement, in accordance with policies such as DO 073, Series of 2014. This directive mandates the swift removal of obstructions and the cessation of prohibited activities within the road right-of-way. The environmental aspect of the removal of obstructions within the Right-of-Way, as conducted by the Department of Public Works and Highways (DPWH) in the Philippines, represents a vital and legally mandated process. This procedure seeks to harmonize the clearing of roadways with ecological preservation, effective waste management, and essential social considerations. DPWH operations are governed by the Social and Environmental Management System (SEMS) Operations Manual (DO 159 s. 2022) and various DENR-related issuances. Obstructions in road right-of-way significantly affect the environment due to severe traffic issues caused by illegal parking (both stalled and working), the prevalence of unauthorized structures, and the improper arrangement of materials and vendors. In summary, both working and stalled illegal parking contribute to traffic congestion and impede circulation, resulting in greater fuel usage and elevated carbon emissions. Unregulated illegal structures and the improper disposal of waste materials often result in soil and groundwater contamination, posing risks to local ecosystems. Improperly placed materials and structures commonly block drainage systems, contributing to urban flooding. Road facilitates the movement of people and good roads create a distinct connection between two places origin and destination with a single mode with varied. This becoming an integrated element of modern life, contributes to economic development and affects the journey of life. The construction, maintenance and rehabilitation of roads however caused widespread environmental and social concerns. Obstruction removal of materials, structures and other before and after road construction has been a standing issue in maintaining the safety to users' orderliness and cleanliness as well as the functionality of the road. The poorly planned road and bad practice in construction maintenance and rehabilitation have reaching and negative effects resulting in damages; in many causes are permanent. These damages may hamper benefits of facilitated leakages, enhancement of mobility and improved access. Road right-of-way obstruction in the Albay 2nd district is a major infrastructural legal challenge, primarily driven by illegal encroachment, weak enforcement, and poor coordination between government agencies and utility companies. The social component in the removal of obstructions within the Road Right-of-Way by the DPWH is a structured process designed to balance infrastructure safety with the welfare of affected communities and businesses.

Theoretical Framework

The theoretical underpinnings in understanding of engineering methodology recommending upscale environmental and social approaches in the road right-of-way obstruction removal, based on the systems theory, sustainable development theory, social acceptability theory, and stakeholder's theory. These theories provide the gear in explaining the relationship of the theoretical and conceptual frameworks which illustrate how the objectives could be attained.

Systems Theory

The systems theory considers the field of inquiry and its applications in getting the answers to the problems being inferred. This research offers the work aiming to develop system ideas useful to interpreting and/or handling real world situations. Systems theory applied in road infrastructure involves viewing the entire road network as a complex system with interconnected components, rather than isolated elements. This approach emphasizes holistic planning and design, enhanced management safety, optimized traffic management, sustainable infrastructure, and asset management. It combines to make

the products, idea and concepts better that is why the study likewise adapted the Input, Process, and Output (IPO) model that breaks down system into or the input processes and outputs which was illustrated in the conceptual framework of the study. This will provide the assumptions of the system then, that its quality occurs in the relationship to the whole. According to Mooren, L., & Shuey, R. (2024), Rasmussen highlighted that the notion of an "event" is ambiguous in that when it is defined more precisely, its likelihood of reoccurrence diminishes. Therefore, this type of causal analysis serves as a less effective preventative tool. It is more advantageous to define categories of events that can subsequently be influenced by the presence of other conditions. This analysis relies on the capacity to break down processes and factors within a dynamic flow of activities. Likewise, the events included in the re-inventory of road right-of-way obstruction removal can be viewed as occurrences that have been categorized according to their classification.

Sustainable Development Theory

As stated by Mensah, J. (2019), the theory of sustainable development highlights the importance of achieving a balance between economic growth and infrastructure enhancement by utilizing life-cycle costing along with innovation and technology. Life-Cycle Costing takes into account the total long-term expenses associated with road infrastructure, such as construction, upkeep, and operation, to ensure that projects are economically feasible and sustainable throughout their duration.

To emphasize the incorporation of sustainability into the complete project life-cycle, according to Marche et al. (2022), there has been an increasing interest from universities and organizations in recent years to investigate the management of road verges as a way to reduce negative impacts and promote the diverse biodiversity in these regions. As per Suprayoga G.B., Bakker M., and Witte P. (2020), sustainability assessment in transportation projects is used to determine if a project "promotes economic growth and meets society's transportation demands in alignment with ecological and human values." According to Hardi, P. and Zdan, T. (1997), several key elements of assessment emerge from a holistic viewpoint. This approach requires an evaluation of individuals and their environment, taking into account both the beneficial and detrimental effects of human actions. When assessing human behavior in this way, it is essential to consider the entire life cycle and the full range of costs affecting not only individuals but also ecosystems. This presents a significant challenge since many factors needing attention cannot be easily quantified in economic terms. Therefore, both monetary and non-monetary valuation methods must be employed. Additionally, a reform in the financial system is necessary to encourage fair labor practices in the removal of road obstructions.

Social Acceptability Theory

As stated by Tenorio, A., et al., 2023, social acceptability refers to "the approval of a project by communities that are impacted, which is based on their timely and informed involvement in the EIA process, especially regarding environmental effects that are of particular concern to them." The idea of social acceptability primarily relates to how willing communities and individuals are to endorse, allow, or promote new initiatives, technologies, or policies. This willingness is shaped by various factors, including social norms, values, context, trust, and an individual's feeling of belonging. These elements are essential in domains such as public policy and healthcare initiatives. Key components of social acceptability encompass: (1) its reliance on context, (2) the significance of involving the community, (3) the impact of shared norms and values, and (4) trust and personal characteristics. As noted by Dvořáková et al. (2024), with the progression of society, there is a growing focus on environmental stewardship and conservation efforts. Initiatives and tools for protecting the environment are

increasingly being implemented in a more regular and effective manner. In light of this backdrop, and based on experiences from projects that have undergone Environmental Impact Assessment (EIA) and their subsequent application, it can be inferred that the EIA process will also adapt, enhance, and become more effective over time.

Stakeholder's Theory

According to DPWH (2021), Stakeholders' Participation. DAO 2017-15 provides the participation of various in the EIA, focusing on the public. Legitimate stakeholders are identified within the impact areas, designated as direct impact area (project footprint and immediate neighbor), and indirect (distance of significant influence). The stakeholders participate in the IEC and consultation at the project announcement, scoping of the EIA, data gathering, review of the EIA Report, public hearing, and project implementation monitoring and audit. Section 5.2 of DAO 2017-15 identifies the following groups as the target audience in the IEC: a) Local government units in regions where all project facilities are intended to be built and where all operations are set to occur. b) Government agencies with a relevant mandate concerning the project type and its impacts. c) Interest groups (NGOs/POs), ideally those with missions specifically connected to the type and effects of the proposed activities. d) Households, business operations, and industries that will face displacement. e) Individuals whose socio-economic well-being and cultural heritage could be impacted by the project, particularly vulnerable groups and indigenous communities. f) Local entities (schools, churches, hospitals).

Conceptual Framework

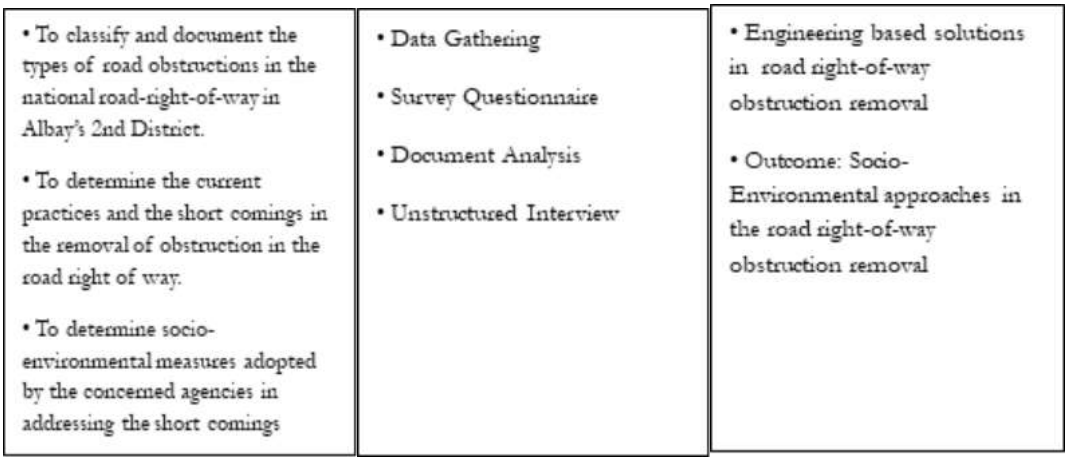

Figure 2 Conceptual Framework Model

Input

To effectively study road right-of-way obstruction removal, it is essential to gather inputs regarding various concepts. This includes identifying common types of obstructions, considering environmental impacts during road clearing, addressing social factors in the clearing process, and recognizing existing shortcomings and challenges. These elements will help determine the sources of obstructions, the socio-environmental considerations involved, and the current policies governing obstruction removal. Initially, identification of the types of road obstruction involves the allocation of documents gathered from the resolved problem areas included in the monthly reports mandated from DPWH DO.73. In addition, the information about the socio-environmental considerations will be gathered from other related studies,

frameworks, and systems, to determine the ideas, interconnections, and solutions relevant in the road right-of-way obstruction removal. In conclusion of identifying the shortcomings and challenges, relevant issues will be determined from the past years of practices and interviews.

Process

The evaluation of the current practices and the comparative of the best practices will be determined from the proactive management practices in the road right-of-way obstruction removal. Thus, evaluating current practices involves assessing the effectiveness and efficiency of existing processes, strategies, or initiatives against predetermined goals and standards. This procedure aids in pinpointing strengths and weaknesses, which ultimately results in more efficient and effective operations. Furthermore, stakeholder consultation is critical in road right-of-way obstruction removal because it ensures project success by minimizing conflict, identifying legal/technical hazards, and promoting transparency in the removal of illegal structures. As per Anne de Bortoli (2022), utilizing both analytical and systemic methods in road maintenance underscores all involved stakeholders, while a thorough array of sustainability indicators is suggested to measure the different impacts of maintenance initiatives. Subsequently, formulas for calculating these indicators are introduced, grounded in a comparison of current evaluation techniques. The concluding transdisciplinary approach draws on road engineering, industrial ecology, acoustics, and economics. Engineering-based intervention for road Right-of-Way (ROW) obstruction removal involves a technical, systematic approach to clearing unauthorized structures, vegetation, or utility lines that impede traffic flow or future road expansion. This process follows strict engineering standards and legal protocols to ensure the safety and functionality of national roads and highways. As noted by Schoonenberg, W.C.H. and Farid, A.M. (2022), these engineering systems feature a complex network of interactions both internally and with other systems. Additionally, their enduring nature implies that implementing any changes necessitates modifications to an existing legacy system rather than designing a completely new one from scratch.

Output

Dressler et al. (2022) explains that sustainability concerns within socio-environmental systems (SES) involve interactions across multiple scales. Global environmental and social changes are shaped by processes that take place in various organizational, temporal, and geographical contexts. SES models must therefore take into consideration these interrelated scales and use trustworthy methods for information sharing between them. As the global interconnectedness of SES continues to rise, the act of upscaling—either by broadening the model's scope or simplifying its resolution—has become increasingly important. Saleh B., Tjaronge M., Tumpu M., (2025), examined development from the perspective of the Provincial Road Management System (PRMS), highlighting its close relationship with government policy formulation. The authors emphasized that creating sustainable road management policies requires the integration of economic, social, and environmental considerations. These policies cover the planning, construction, and maintenance of roads that are efficient, safe, environmentally responsible, and supported by active community involvement. The research focused on two major objectives: first, to develop an appropriate framework for road management policies that support sustainable development, and second, to identify strategies for sustainable road development that generate positive effects on communities. To address these aims, the study adopted the PRMS framework and employed a literature review with descriptive analysis based on Gro Harlem Brundtland's Sustainable Development Theory. The findings identified nine key areas essential for sustainable road management: spatial planning, sustainable road development, sustainable road

maintenance, community participation, public awareness improvement, public transportation enhancement, technology utilization, local industry support, and environmental impact management. The study concluded that sustainable road policies should be established at an early stage and carefully designed with multiple considerations to ensure effective road management and long-term regional sustainability.

Problem in the Field

As part of the road maintenance feature inventory the act of removal of obstruction is important to provide the acceptable road condition and to ensure safety and uniformity. The local government project supported the maintenance, rehabilitations, betterment or for improvement of the national roads through infrastructure expenditure program. The obstruction unit complies with the requirements by monitoring the national roads by weekly inspection, issuance of notice of obstruction, and making monthly report outputs. Enforcement gaps in road obstruction removal frequently stem from internal and external observation of resource and logistical constraints, socio-political and behavioral barriers, and administrative & legal gaps. Firstly, resource and logistics constraints has tangible limitations for lack of equipment, inadequate manpower, and financial costs. Secondly, socio-political and behavioral barriers are deeply intertwined primary from systemic issues followed by the exterior obstacles in road obstruction removal like public non-compliance, resistance to enforcement, and conflicting interests. Thirdly, the impended administrative and legal process due to displacement issues, reporting, and monitoring. The main challenges encountered by the DPWH in Albay 2nd district based on the gathered data on monthly reports are the illegal road obstruction encroachments such as house & stores, business establishments, vehicle parking, junk items, construction materials, outpost and tree obstructions. These found obstructions was subjected to instant voluntary removal during the monitoring by the obstruction unit. The policy remains unfamiliar for some communities.

Objectives of the Study

- To classify and document the types of road obstructions in the national road-right-of-way in Albay's 2nd District;
- To determine the current practices and the short comings in the removal of obstruction in the road right of way;
- To determine socio-environmental measures adopted by the concerned agencies in addressing the short comings causing the road right of way obstructions; and
- To propose engineering-based solutions that upgrade social and environmental approaches in the sustainability of road right-of-way obstruction removal.

2. METHODOLOGY

This stage of study discusses the methodology which incorporates the discussion on research design, sources of data, respondents of the study, research instruments, data gathering procedures, data treatment and analysis as well as the ethical considerations. The research will present the Research Instrument (RI)used and the validation of same. The RI utilized is a Survey Questionnaire and Documentary Analysis.

Research Design

This study adopted a mixed-method approach combining qualitative and quantitative methods to ensure a comprehensive analysis of road obstruction removal practices. A conceptual method and descriptive-exploratory design are used to classify obstructions, assess existing approaches, identify gaps, and

develop engineering solutions. In defining the current practice in road obstruction removal, the activities in rectifying road obstruction and instruction of the policy of RROW law and data gathering by recording geographical information and photographs to be included by the DPWH 2nd district of Albay and records. The first part of this study is to conduct a descriptive analysis with the frequency of road obstruction by reviewing the 2023 to 2025 Inventory of Obstructions Within the Right-Of-Way of National Roads (D.O. 73, s.2014) from DPWH – Albay 2nd District of Albay and computing the percentage of each obstruction found on each road section of Albay 2nd district. The allocated reports must be tracked and employed thematic analysis by reviewing visual materials gathered from the problem areas in Albay 2nd District, by determining the type of obstruction, and by detailed analysis. To focus on the practices in road obstruction removal by determining the social and environmental aspects wherein indicators are crafted from the review of related literature and studies and that of DPWH Orders and Guidelines. On the shortcomings on such practices, indicators are also set to determine the social and environmental encountered. Likewise, the measures adapted in addressing these short comings by applying objective assessments of socio-environmental approach to measure the community's knowledge and understanding of illegal usurpation and obstruction within national roads is tackled. The proposed engineering-based solutions in the socio-environmental approaches, shortcomings were crafted to sustain the road right-of-way obstruction removal in the 2nd district of Albay.

Study Area

The research's locale is Albay's 2nd District, covering municipalities and cities under its jurisdiction. Key areas with recurring road obstructions are prioritized.

Sources of Data

The primary sources are from the survey questionnaire being provided by the respondents who have knowledge in the clearing of obstruction in the RROW within the national road of the 2nd district of Albay. The secondary sources of data are from the reports that are extracted from the Maintenance Section of the Department of Public Works and Highways - Albay 2nd District Engineering Office.

Respondents of the Study

The selection of respondents for this study is under the mixed-methods approach to take upscale socio-environmental perspective and engineering-based solutions. The selection of 25 classified respondents from the concerned agencies considered those who can provide in-depth information in the road right-of-way obstruction. The respondents are from DPWH-Albay 2nd DEO, DENR-EMB V, Barangay-Local Government Units, and the Project Affected Persons who have direct knowledge or experience with the road clearing projects shall indicate the scores in the social practice. The selected respondents from the DENR-EMB-V are those who have knowledge in the environmental aspects who shall indicate the scores in the environmental practice, and their recommendations were used for qualitative insights.

Department of Environment and Natural Resources – Environmental Management Bureau V	6	(Engineer & Staff)
DPWH Albay 2nd DEO	7	(Engineer & Staff)
Barangay - LGU	6	Those who are exposed in the road project nearby their areas.

Involved Civil Society Representative	6	Those who are collaborative in the project as recommended by the Punong - Barangay
TOTAL	**25**	

Research Instrument

A survey questionnaire is prepared as per APPENDIX B. Objective 1, deals with identification of objection of removal from 2023-2025 using documentary analysis. Whereas for Objectives 2 to 3, the survey questionnaire is utilized to determine the Environmental-Social Approaches being practiced at the removal of obstructions in the Road Right of Way (RROW) within the national road in the 2nd District of Albay. Likewise, the short comings and measures in addressing these shortcomings are considered in this research instrument which was validated through DPWH Engineers who are not part of the respondents but are knowledgeable in the process of road obstruction removal. Unstructured interview Guide is incorporated to clarify some vague responses, such as in the shortcomings and current practices.

Data Gathering Procedure

Letter(s) attached in the APPENDIX A are sent to the head office of DPWH 2nd District Engineering Office, Department of Environment and Natural Resources – Environmental Management Bureau V, Barangay – LGU and to the affected persons. Coordination is made to the concerned respondents. The data are gathered from the concerned entities; DPWH Albay 2nd DEO, DENR – EMB V, Barangay – LGU, and to other affected persons using the survey questionnaire as presented in the appendix. Likewise, the four-point Likert Scale was utilized for these variables using the indicators taken, referenced in the review of related literature.

Data Collection Methods

Classification and Documentation of Road Obstructions

On rectifying road obstruction with the aid of the RROW law (specially DPWH - Department Order No. 73) to conduct data gathering to the problem areas with obstruction, it applied field survey and site inspection to directly determine important information to be included to the reports, to collect photographic evidence and GIS mapping to identify obstruction patterns and hotspot areas, and to advocate the society about the removal of obstruction within the national roads, with respect to the current practices.

Evaluation of Current Removal Practices

The study evaluated the current practices and short comings in the removal of obstruction through consultation and conducting purposive sampling through the employee of Department of Public Works and Highways – Albay 2nd District Engineering Office – Maintenance Section, Department of Environment and Natural Resources - Environmental Management Bureau, Barangay Local Government Unit, and concerned entities and examined best practices of similar road-right-of-way (RROW) project.

Assessment of Current Mitigation Measures

The study evaluated the effectiveness of existing mitigation efforts on environmental sustainability and community acceptance through purposive sampling through the employee of Department of Public Works and Highways – Albay 2nd District Engineering Office – Maintenance Section, Department of

Environment and Natural Resources - Environmental Management Bureau, Barangay Local Government Unit, and concerned entities. And examine the legal and regulatory framework governing obstruction removal and its alignment with the sustainable practices.

Development of Engineering Solutions and Data Analysis Techniques

a. Descriptive Statistics – Summarize quantitative data from field surveys and impact assessments.

Data Treatment Analysis

The data gathered for Objective 1 came from the documents of DPWH-V, 2nd District Office on the identified The District Summary Of Status Report On Prohibited Uses Within The Right-Of-Way Of National Roads (D.O. NO. 73) from the CY 2023-2025. The data gathered for Objectives 2 and 3 are analyzed using weighted mean and interpreted result based in the descriptive provided for the current practices, short comings and measures, weighted mean using the four-point Likert Scale, this used the following scale, range and description:

Scale	Range	Description
4	3.5-4.00	Strongly Agree
3	2.50-3.49	Agree
2	1.50-2.49	Disagree
1	1.00-1.49	Strongly Disagree

Ethical Considerations

This study complied with the stringent ethical standards to guarantee respondent's protection and integrity. All respondents, including government employees, local government unit, non-governmental members, civil society representatives, and maintenance staff, were informed of the motive, extent, and the objective of the study. Permission was sought from the concerned offices in order to gather relevant data necessary for the attainment of the objectives set. The approval is reflected in the attachments to prove that data gathering was taken with utmost care to protect sensitive information obtained from the respondents.

3. RESULTS

This part of the study discusses the findings on the classification and documentation of the types of road obstruction being cleared in the national road right of way by DPWH in the 2nd District of Albay. Furthermore, results on the practices and shortcomings in undertaking the road obstruction clearing are gathered as well as the measures adapted in addressing the shortcomings on the context of soci0-environmental approaches. The recommended proposed engineering solutions are made based on the findings of the study on shortcomings and on measures being adapted in the road clearing of obstructions

Classification and Documentation of the types of Road Obstruction Cleared in the Road Right of Way within the National Road by DPWH in the 2nd District of Albay

Based on the documents gathered from DPWH-V- Maintenance Section's Reports and Records, the classification on the types of road obstruction cleared is tabulated in Table 1. Table 1 identified the classification based on the types or categories of obstruction removed from Calendar Years (CY) 2023-2025. Under DPWH DO 73 s. 2014 and DILG Memorandum Circular No. 2020-027 defines road

obstructions as any material or activity impending free, safe passage along the sidewalk, shoulder or carriageway. On The types or categories of obstruction under A. Doable Obstructions which includes: Category A represent Unfixed Objects which construction materials(I.e., sand and gravel, cement, lumber, steel bar, earth, spoil, waste materials, debris, embankments, heaps, or the like) , vehicle (working/stalled), junk items, household, commercial, industrial wastewater, and sewage, clothesline/drying of clothes, drying/stockfiling of crops, and similar items like plants or plant boxes that impede traffic or sidewalk use while Category B Pets and Livestocks which are prohibited in raising them or allowing them to roam within the ROW and Category C which includes temporary structures such as stall, canopy, small billboard, small signages, advertisement , light materials fence, railing, garbage receptacle, driveway, ramp, plant box, hump, shrub, and the like, and B.Long term(LT) Obstruction which includes building, house, shanties, stores, shops, sheds, outposts, large billboards, large signages, advertisements, fences, walls, basketball court, barangay hall/outposts and the like. However, this study looked into the cumulative numbers of each category and not as separate units as described. As shown on Table 1, in 2023 a total of obstructions cleared totaled to 293, broken down into category A is 176; Category B has 2 ; Category C has 105 and LT corresponds to 10 in number while in 2024 and 2025, the total number of obstruction cleared in all categories are 242(with Category A having 148; Category B is 0; Category C is 80 and LT is 14) and 179 (with Category A having 108; Category B is 0 and Category C is 37 and LT is 34). Table 1 shows that from CY 2023 up to CY 2025 most of the obstructions cleared from the road right of way within the national road in the 2nd District of Albay is dominated by Category A items having garnered 176 (60.07%) in 2023 ,got 148(61.34%) and in 2025 have 108(60.34 %) followed by Category C items having 105(33.84%) in 2023, got 80(33.06%) in 2024 and garnered 20.67% in 2025 and with LT items having 10(3.41%) in 2023, got 14(5.7%) in 2024 and garnered 34(20.67%), and the least on obstructions cleared is Category B having minimal number or zero from 2023 to 2025. Hence, mostly the efforts made by DPWH in the 2nd District of Albay are focused on the Unfixed Objects as defined under DO 73 series of 2014.

OBSTRUCTION TYPE:

DOABLE OBSTRUCTION:

Category A: Unfixed Objects - Construction materials (i.e., sand, gravel, cement, lumber, steel bar, earth spoil, waste material, debris, embankment, heap, etc.), vehicle (working/stalled), junk items, household, commercial, industrial wastewater and sewage, clothesline/drying of clothes, drying/stockpiling of crops, and similar items.

Category B: Pets and Livestock - Raising of animals or allowing them to road within the right-of-way

Category C: Temporary Structures - Stall, canopy. Small billboard, small signage, advertisement, light material fence, railing, garbage receptacle, driveway, ramp, plant box, hump, shrub, and the like.

LONG-TERM OBSTRUCTION: Building, house, shanty, store, shop, shed, large billboard, large signage, fence, wall, basketball court, barangay hall/outpost and the like.

NAME OF ROAD SECTION	2023				2024				2025			
	TOTAL				TOTAL				TOTAL			
	A	B	C	LT	A	B	C	LT	A	B	C	LT
Maharlika Highway (KO513+544-KO539+4	24.91%	0.68%	16.04%	3.41%	8.26%	0.00%	12.81%	4.13%	3.91%	0.00%	2.23%	16.76%
MH Jct.-Legazpi Sto. Domingo-Tabaco-Cam (K0527±877 - K0539+0	22.87%	0.00%	13.99%	0.00%	34.30%	0.00%	9.50%	0.83%	34.64%	0.00%	8.94%	0.00%
Camp Bagong Ibalong F (K0528±205 - K0528+8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%
Lakandula Drive (K0531±058 - K0532+7	6.14%	0.00%	3.41%	0.00%	10.33%	0.00%	2.48%	0.00%	12.85%	0.00%	7.26%	0.56%
Lakandula Drive Portion (Sta. 0+000 - Sta. 0+759)	0.68%	0.00%	0.34%	0.00%	0.00%	0.00%	1.65%	0.00%	0.00%	0.00%	0.00%	0.00%
Legazpi Airport Road (K0530±990 - K0530+9	1.37%	0.00%	0.68%	0.00%	2.89%	0.00%	2.89%	0.00%	2.79%	0.00%	0.56%	0.00%
Elizondo St. (Sta. 0+000 - Sta. 0+250)	0.68%	0.00%	0.00%	0.00%	2.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Legazpi Access Road (Sta. 0+000 - Sta. 0+415)	0.68%	0.00%	0.00%	0.00%	0.41%	0.00%	2.07%	0.00%	0.56%	0.00%	0.00%	0.00%
Quezon Avenue Wharf I (Ch. 0+000 – Ch. 0+118	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Quezon Avenue Wharf Road (Ch. 0+000 - Ch. 0+408)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rizal Avenue (Sta. 0±142)	0.00%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Legazpi City - Punta De Leon Rd (K0529±131 - K0581+5	2.05%	0.00%	1.37%	0.00%	2.48%	0.00%	1.65%	0.83%	4.47%	0.00%	1.12%	1.12%
Banquerohan-Bariis-Sogod-Sorsogon Bdry (K0544±605 - K0555+1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.56%	0.56%
Comun-Inarado-Peñafrancia Road (K0517±323 - K0531+3	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	60.07%	0.68%	35.84%	3.41%	61.16%	0.00%	33.06%	5.79%	60.34%	0.00%	20.67%	18.99%
	100.00%				100.00%				100.00%			
	176	2	105	10	148	0	80	14	108	0	37	34
	293				242				179			

Table 1 Percentage and Total of Inventory of the Removal of Road Obstruction within Road Right-of-Way in 2nd District of Albay CY 2023-2025

Current Socio-Environmental Practices in the Removal of Obstruction in the Road Right-of-Way within the National Road by DPWH 2nd District of Albay

The Social Practices in this study covered the notification to stakeholders', Awareness Campaigns provided, involvement of Non-Government Organizations (NGOs), conduct of Monitoring, reports submission of accomplishments or action on complaints if any, planting of Trees and other flowering

plants maintained. Table 2 shows the current social practices being adapted by DPWH in the 2nd District of Albay.

Environmental Practices	WM	Interpretation
• Environmental Impact Assessment is Conducted and ECCs are applied to DENR-EMB	**3.68**	**Strongly Agree**
• The Environmental Impact Assessment Project Office shall provide environmental and social assessment support to the ROW	**3.68**	**Strongly Agree**
• Obstructions or illegal structures are removed according to the procedures	**3.44**	**Agree**
• Removed materials or wastes are properly taken cared of through: (a) LGUs sanitary landfill (b)contracted out by administration of DPWH office	**3.36**	**Agree**
Average	**3.54**	**Strongly Agree**
Others: 1. Turn-over usable timber to the proper government agency such as the DENR on LGU. Non - Timber waste must be properly disposed avoid burning		

Table 2 Environmental Practices in Road Obstruction Removal

While environmental practices consider indicators on the conduct of Environmental Impact Assessment(EIA) and ECCs are applied to DENR-EMB, EIA Project Office shall provide environmental and social assessment support to the ROW, obstructions or illegal structures are removed according to procedures, Removed materials or wastes are properly taken cared of through its disposal at a) LGU Sanitary landfill b) Contracted out by Administration of DPWH Office in the 2nd District of Albay and others: Turnover of usable timber to the proper government agency such as DENR or LGU. Non-timber waste must be properly disposed. Avoid burning. Table 2 summarizes the results on Environmental Practices being done. This portion discusses the current environmental practices in the removal of obstruction in the road-right-of-way. This is illustrated in TABLE 2; Environmental practices in road obstruction removal. TABLE 2 shows the current environmental practice rate which is 3.54 (Strongly Agree). Two indices which are; Environmental Impact Assessment is Conducted and ECCs are applied to DENR-EMB; and The Environmental Impact Assessment Project Office shall provide environmental and social assessment support to the ROW; shows the highest weighted mean of 3.68 (Strongly Agree). The two indices is followed by; Obstructions or illegal structures are removed according to the procedure; which is represented by 3.44 (Agree). The index with the least percentage is; Removed materials or wastes are properly taken cared of through: (a) LGUs sanitary landfill (b)contracted out by administration of DPWH office; 3.36 percent (Agree). Added by the respondent's suggestions is; 1. Turn-over usable timber to the proper government agency such as the DENR on LGU. Non - Timber waste must be properly disposed avoid burning. The results consider the importance of the Environmental Impact Assessment in environmental practices and the proper procedure supported by different agencies in road obstruction removal.

Social Practices	WM	Interpretation
• Notice is given to LGUs and other entities	**3.24**	**Agree**
• Awareness campaigns are Provided	**3.24**	**Agree**
• NGOs and other concerned are involved	**3.08**	**Agree**
• Conduct monitoring	**3.40**	**Agree**
• Reports are submitted for each accomplishment or action on complaints	**3.28**	**Agree**
• Trees are planted and other flowers plants are maintained.	**2.58**	**Agree**
Average	**3.14**	**Agree**
Others: 1. Replanting condition may apply		

Table 3 Social practices in Road Obstruction Removal

This portion discusses the current social practices in the removal of obstruction in the road-right-of-way. This is illustrated in Table 3; Social practices in road obstruction removal. Table 3 shows the current social practice rate which is 3.14 (Agree). The index with the highest percentage is Conduct monitoring; with 3.40 percentage (Agree). This is followed by Reports are submitted for each accomplishment or action on complaints; which is represented by 3.28 (Agree). The next index is followed by the two indices which are: Notice is given to LGUs and other entities and Awareness campaigns are Provided; which is represented by 3.24 (Agree). The two indices are followed by; NGOs and other concerned are involved; 3.08 percent (Agree). The index with the least percentage is; Trees are planted and other flowers plants are maintained; 2.58 percent (Agree). The result considers the importance in the aspect of social practices of conducting monitoring, the submission of accomplishment reports, and the awareness of different agencies and the communities in road obstruction removal. In addition, the result also considers the plants/ flowers should be properly maintained. And further suggested by a respondent that replanting condition may also be implemented.

Current Socio-Environmental Practices in the Removal of Obstruction in the Road Right of Way within the National Road by DPWH 2nd District of Albay

The Social Practices in this study covered the notification to stakeholders, Awareness Campaigns provided, involvement of Non-Government Organizations (NGOs), conduct of Monitoring, reports submission of accomplishments or action on complaints if any, planting of Trees and other flowering plants maintained. Table 2 shows the current social practices being adapted by DPWH in the 2nd District of Albay. While environmental Practices consider indicators on the conduct of Environmental Impact Assessment(EIA) and ECCs are applied to DENR-EMB, EIA Project Office shall provide environmental and social assessment support to the ROW, obstructions or illegal structures are removed according to procedures, Removed materials or wastes are properly taken cared of through its disposal at a) LGU Sanitary landfill b) Contracted out by Administration of DPWH Office in the 2nd District of Albay and others: Turnover of usable timber to the proper government agency such as DENR or LGU. Non-timber waste must be properly disposed. Avoid burning.

Environmental Aspects	WM	Interpretation
• EIA not a requirement	**1.84**	**Disagree**
• ECC not usually applies or taken	**1.76**	**Disagree**

• Obstructions or illegal structures are removed according to the procedures	**2.84**	**Agree**
• No provisions to control dust emission	**2.16**	**Disagree**
• Equipment used for demolition not properly equipped with proper environment friendly provisions	**1.8**	**Disagree**
• No dumping place for demolished materials	**2.4**	**Disagree**
• Lack of storage facilities for removed obstruction materials	**2.1**	**Disagree**
Average	**2.13**	**Disagree**

Table 4 Environmental Aspects to the Short Comings in Road Obstruction Removal

This portion discusses the environmental aspects to the short comings in the removal of obstruction in the road-right-of-way. This is illustrated in Table on environmental aspects to the short comings in road obstruction removal. Table 4 shows the short coming in environmental aspect rate which is 2.13 (Disagree). The index that attained the least percentage is; ECC not usually applies or taken; that attained a 1.76 percentage (Disagree), followed by Equipment used for demolition not properly equipped with proper environment friendly provisions; which is represented by 1.80 (Disagree). This is followed by EIA not a requirement; which is represented by 1.84 (Disagree), then lack of storage facilities for removed obstruction materials; 2.10 percent (Disagree), No provisions to control dust emission which is represented by 2.16 (Disagree). The index with the most percentage is No dumping place for demolished materials which is represented by 2.40 (Disagree). The result shows a low proportion to the short comings in the environmental aspects in the road obstruction removal.

Social Aspects	**WM**	**Interpretation**
• Participation of concerned LGUs/ entities not fully given during meetings	**2.36**	**Disagree**
• Lack coordination among concerned entities	**2.44**	**Disagree**
• Lack of cooperation	**2.76**	**Agree**
• Funds not always sufficient	**2.92**	**Agree**
• Funds are usually delayed in its releases	**2.96**	**Agree**
• Document submission is not prompt	**2.64**	**Agree**
• Lack of trainings to those involved in the operation on road obstruction removal	**2.88**	**Agree**
Average	**2.71**	**Agree**

Table 5 Social Aspects to the Short Comings in Road Obstruction Removal

This portion discusses the social aspects to the shortcomings in the removal of obstruction in the road-right-of-way. This is illustrated in Table 5 on social aspects to the shortcomings in road obstruction removal. Table 5 shows the shortcoming in social aspect rate which is 2.71 (Agree). The index that attained the least percentage is Participation of concerned LGUs/ entities not fully given during meetings with 2.36 (Disagree). Followed by Lack of coordination among concerned entities which is

represented by 2.44 (Disagree). This is followed by Document submission is not prompt which is represented by 2.64 (Agree). This is followed by Lack of cooperation; 2.76 percent (Agree). This is followed by Lack of trainings to those involved in the operation on road obstruction removal which is represented by 2.88 (Agree). This is followed by Funds not always sufficient which is represented by 2.92 (Agree). The index that attained the most percentage is Funds are usually delayed in its releases; which is represented by 2.96 (Agree). The result shows more than half in proportion of the short comings in the social aspects in the road obstruction removal.

Socio-environmental Measures Adopted by the Concerned Agencies in Addressing the Shortcomings causing the Road Right of Way Obstructions

Social Aspects	**WM**	**Interpretation**
• Notices are disseminated on time say about 3 days before the meeting date.	**3.08**	**Agree**
• Awareness Campaigns should frequently be done to saturate stakeholders' participation and get their cooperation and participation	**3.12**	**Agree**
• Training Programs should be conducted to those involved to update them on the considerations to be undertaken for more effective and efficient performance	**3.2**	**Agree**
• Funds be allocated and release on time	**2.84**	**Agree**
Average	**3.06**	**Agree**
Others: 1. Strengthen monitoring specially during actual cutting operation 2. Enforce control over timber transport and disposal		

Table 6 Measures to Address these Short Comings in terms of Social Approach

This portion discusses the measures in terms of social approaches to address the short comings in the removal of obstruction in the road-right-of-way. This is illustrated in Table 6, measures to address these short comings in terms of social approach. Table 6 shows the social approach rate which is 3.06 (Agree). The index that attained the most percentage is Training Programs should be conducted to those involved to update them on the considerations to be undertaken for more effective and efficient performance; attained 3.20 (Agree) percentage.

Environmental Aspects	**WM**	**Interpretation**
• The EIA shall be incorporated by big or small activities.	**3.16**	**Agree**
• Dust should be prevented during activities.	**3.12**	**Agree**
• Noise shall be minimize.	**3.12**	**Agree**
• Vibration of Equipment's shall be minimize	**3.16**	**Agree**
• Proper disposal of removed materials shall be made on the LGUs sanitary landfill or DPWH storage facilities.	**3.16**	**Agree**
• Equipment or vehicles shall be properly equipped for the removal of obstruction	**3.24**	**Agree**

Average	**3.16**	**Agree**

Table 7 Measures to Address these Short Comings in terms of Environmental Approach

This is followed by Awareness Campaigns should frequently be done to saturate stakeholders' participation and get their cooperation and participation; which is represented by 3.12 (Agree). This is followed by Notices are disseminated on time say about 3 days before the meeting date which is represented by 3.08 (Agree). The index with the least percentage is; Funds be allocated and release on time; which is represented by 2.84 (Agree). Added by the respondent's suggestions are: 1. Strengthen monitoring specially during actual cutting operation; and 2. Enforce control over timber transport and disposal. The result showed the importance to focus on the measures to address the shortcomings in terms of social approach.

This portion discusses the measures in terms of environmental approaches to address the short comings in the removal of obstruction in the road-right-of-way. This is illustrated in Table 7, measures to address these shortcomings in terms of environmental approach. Table 7 shows the environmental approach rate which is 3.16 (Agree). The index with the highest percentage is Equipment or vehicles shall be properly equipped for the removal of obstruction; 3.24 (Agree). This is followed by three indices which are: The EIA shall be incorporated by big or small activities; Vibration of Equipment's shall be minimize; and Proper disposal of removed materials shall be made on the LGUs sanitary landfill or DPWH storage facilities; which are represented by 3.16 (Agree). This is followed by two indices with the least percentage, which are: Dust should be prevented during activities; and Noise shall be minimized which are represented by 3.12 (Agree). The result showed the importance to focus on the measures to address the short comings in terms of environmental approach.

From the stand point of the researches on the shortcomings and socio-environmental approaches engineering-based solutions are to be adapted for obstruction.

- **Precision Mechanical Clearing**

Utilizing advanced foresting machinery and scientific tree - harvesting equipment allowing the removal of only necessary vegetation obstructing the road while preserving surrounding habitats, and reducing deforestation impacts.

- **Automated Waste Management and Debris Removal**

Through implementing solar-powered automated trash intercepts and such trash wheels in water bodies provides a continuous low emission solution for clearing waterborne obstructions.

- **Zero Emission Equipment**

Through replacing desired powered bulldozers and excavators with electric or hybrid alternative that decreases noise pollutions and greenhouse gas emissions.

- **Circular Solid Material Reuse**

This applies Pre-requiring on-size recycling facilities and turn cleared green waste with arrangements, and crushed concrete aggregates, reduces transportation emissions and land fill works.

- **Real-time Environmental Monitoring**

Using IoT sensors to monitor noise, air, quality, and water turbidity, during clearing activities and ensure compliance with environmental standards and protect local communities.

These integrated approaches allow infrastructure projects to prove without causing permanent social and environmental harm.

Proposed Engineering Based Solutions in the improvement of the socio-environmental approaches in addressing shortcoming and measures are being adapted in the clearing of obstruction in the road right of way within the national road by DPWH in the 2nd District of Albay. To efficiently address the efficiency and minimize socio-environmental shortcomings encountered in the clearing of obstruction in the road right of way within the national road by the DPWH in the 2nd District of Albay the following are engineering based solutions are proposed:

- Integrated GIS Based Road Mapping to create a precise digital inventory of ROW limits in the National Road in the DPWH 2nd District of Albay
- Pre-cast Concrete Barriers: Instead of permanent fencing, use movable, pre cast concrete barriers to define and protect road shoulders in high traffic areas, reducing the need for destructive removal later.
- Improved Drainage Design: Rather than just clearing, redesign drainages to prevent siltation, such as installing silt traps, at culvert entrance.
- Structural Evaluation Tools: Utilization of Non-Destructive Testing (NDT) techniques such as falling weight deflectometer (FWD) to evaluate the impact of heavy traffic on road integrity near cleared areas, ensuring structural longevity.
- Sustainable Materials handling: implementing on-site crushing for concrete waste debris to reuse it as sub-base materials addressing environmental challenge of disposal.
- Noise and Dust Mitigation: Engineering Controls such as sound barriers, wet suppression of dust, selecting electric machinery to reduce the noise pollution that impacts local community.
- Smart Waste Management Planning: Developing Site Waste Management Plans (SWMP) that strictly define how waste is separate, stored, transported, ensuring compliance with environmental standard(aquabarrier.com).
- Waste Valorization: Engineering processes to convert cleared woody biomass into biochar or mulch, crushing concrete debris on-site for reuse as road sub-base, reducing the need for landfilling.
- GPS-Guided Machinery; Implementing machine control technology to ensure earthmoving equipment stays within strictly defined boundaries, reducing unintended damage.
- Digital Land Information Systems: Using high resolution imagery and digital databases to precisely map and engage with land occupants, reducing conflict over encroachment before clearing begins.
- Community Based Infrastructure Development engaging with local communities in designing pathways or structures, utilizing locally available materials to increase acceptance and reduce the “us -vs- them mentality(www.iied.org)

4. DISCUSSIONS

This portion of the study provides the interpretation and analysis of the results on the classification and documentation on the clearing of obstruction in the road right of way within the national road by DPWH in the 2nd District of Albay; the socio-environmental practices being done and shortcoming as well as the measures being considered and the engineering based solutions that may be proposed to improve the socio-environmental approaches in the clearing of obstruction in the road right of way within the national road by the DPWH in the 2nd District of Albay.

Classification and Documentation of the Types of Road Obstructions in Road-Right-of-Way in the National Road of 2nd District of Albay

This study aimed to classify and document the types of road obstructions in the national road-right-of-way in Albay's 2nd District. The classification of the type of obstruction based on 2025 baseline and directives from the Department of Public Works and Highways (DPWH), the district summary re-inventory of obstructions within the right-of-way (ROW) of national roads is a mandatory, ongoing monitoring process aimed at clearing illegal structures to ensure road safety and efficiency. It is mandated that district engineers are required to submit regular, updated inventories of all illegal structures, obstructions, and encroaching utility posts along sidewalks and shoulders to the bureau of maintenance. The type of obstruction is determined into two, the first one is the long-term obstruction, it covers long-term structures like building, house, shanty, store, shop, shed, large billboard, large signage, fence, wall, basketball court, and barangay hall/outpost. And the second type of obstruction is doable obstruction. Doable obstruction has been categorized into three types, unfixed objects, pets and livestock, and temporary structures. Primarily, unfixed objects are determined by construction materials (i.e., sand, gravel, cement, lumber, steel bar, earth spoil, waste material, debris, embankment, heap, etc.), vehicle (working/stalled), junk items, household, commercial, industrial wastewater and sewage, clothesline/drying of clothes, drying/stockpiling of crops, and similar items. In addition, pets and livestock are determined by the raising of animals or allowing them to road within the right-of-way. In conclusion, temporary structures are determined by stall, canopy, small billboard, small signage, advertisement, light material fence, railing, garbage receptacle, driveway, ramp, plant box, hump, shrub, and the like. Subsequently, the documentation of the gathered data from real time monitoring of the national roads, text brigade reports, and accident reports will be organized with respect to the road id, road stationing, action taken, and description of obstruction, with the attached justification photographs of before, during, and after the road obstruction removal, accordingly to the Department of Public Works and Highway's Inventory of obstructions within the right-of-way of national roads; D.O 73, s. 2014. Shown on Table 1: Percentage and total of inventory of the removal of road obstruction within road right-of-way in 2nd District of Albay CY 2023-2025 is the total number of the removed obstruction within the road-right-of-way in the national road of Albay 2nd District. In 2023, the total number of the removed obstruction is 293. In 2024, the total number of the removed obstruction is 242. And in 2025, the total number of the removed obstruction is 179. Table 1 also exhibits that in year 2023 the unfixed objects have the highest percentage of 60.07% which shows more than half of the sum total, followed by temporary structure has the percentage of 35.84%, followed by the long-term obstruction has the percentage of 3.41%, and pets and livestock has the percentage of 0.68%. Furthermore, in year 2024 the unfixed objects have the highest percentage of 61.16% which shows more than half of the sum total, followed by temporary structure has the percentage of 33.06%, and followed by the long-term obstruction has the percentage of 5.79%. In conclusion, in year 2025 the unfixed objects have the highest percentage of 60.34% which shows more than half of the sum total, followed by temporary structure has the percentage of 20.67%, and followed by the long-term obstruction has the percentage of 18.99%.

In practice, removal of road obstruction should consider community involvement because it enhances the mandatory requirements of the Presidential Decree 17: Revised Philippine Highway Act, Section 23 and the other policies that pertains to Road-Right-of-Way Act. These policies reflect the orderliness, safety, and cleanliness with the consideration of environmental and social interests for the affected communities. Through DPWH Department Order 73, in monitoring the national road with illegal

obstruction, we should focus on community awareness to clearly advocate for the affected communities about the mandate of the policy to lessen the illegal obstruction.

The Current Practices and the Shortcomings in the Removal of Obstruction in the Road Right of Way

The portion of environmental practices in road obstruction removal in the road right-of-way demonstrated the current environmental practice rate of 3.54 (Strongly Agree). The results highlight the importance of the Environmental Impact Assessment in environmental practices and the proper procedure supported by different agencies in road obstruction removal. According to National Environmental Policy Act (NEPA), environmental impact assessment principles provide the environmental consequences for decision making which promote social and sustainable development by identifying approaches alternative and integrating measures. This process typically includes a review of potential impacts, data collection and analysis, identification of integrating measures from input generated documents. The findings are consistent with the support of the environmental impact assessment through identifying the best practices in the removal of obstructions in the road right-of-way.

The portion of social practices in the removal of obstruction in the road right-of-way demonstrated the current social practice rate which is 3.14 (Agree). The result considers the importance in the aspect of social practices of conducting monitoring, the submission of accomplishment reports, and the awareness of different agencies and the communities in road obstruction removal. The result also considers the plants/ flowers should be properly maintained. And furtherly suggested by a respondent that replanting condition may also be implemented. According to Department of Public Works and Highways, Project operation and evaluation phase includes the assessment of the overall performance on the implementation of the environmental and social safeguards spill-over measures continue after construction (Social Environmental Management System Manual, 2021). Social and community dimensions of Right-of-Way (RROW) compliance involve ensuring that infrastructure projects, particularly road construction, respect the rights and well-being of affected communities and incorporate measures to mitigate negative impacts and maximize benefits. This includes ensuring just compensation for land acquisition, providing resettlement policies for those displaced, and engaging in meaningful consultations with affected communities throughout the project lifecycle.

The portion of environmental aspects to the shortcomings in the removal of obstruction in the road right-of-way demonstrated the short coming in environmental aspect rate which is 2.13 (Disagree). The result shows a low proportion to the short comings in the environmental aspects in the road obstruction removal. According to Suprayoga G.B., Bakker M., and Witte P. (2020), In transportation projects, sustainability assessment is applied to evaluate whether a project “contributes to favor economic development and fulfill the transportation needs of the society in a manner consistent with ecological and human values” (Bueno P.C., Vassallo J.M., & Cheung K., 2015, Sustainability assessment of transport infrastructure projects: A review of existing tools and methods. Transport Reviews, 35(5) p. 642). Sustainable development theory emphasizes environmental protection by minimizing ecological impact, this could be resolved by resource efficiency, pollution reduction, habitat preservation, and climate change mitigation.

The portion of social aspects to the shortcomings in the removal of obstruction in the road right-of-way demonstrated the short coming in social aspect rate which is 2.71 (Agree). The result signals more than half in proportion of the short comings in the social aspects in the road obstruction removal. According to Macayan R., Saguban L., Macayan W., (2025), upfront costs, lack of training, and interoperability

challenges often hamper technical innovation. This reluctance, especially in provincial or rural settings, can delay the modernization of traffic systems that are vital for both efficiency and public safety. These layered challenges call for a collaborative, multi-stakeholder approach to road safety and traffic management—one that involves not only engineers and contractors but also local government units, enforcement agencies, and the commuting public. There is also a clear need for capacity-building programs, site-specific training modules, and resource allocation frameworks that take into account the unique needs of regional infrastructure projects, which are often overlooked in national urban-centric planning (Awareness and Compliance of Site Engineers with Road Safety and Traffic Management: The Case of 2nd District, Negros Oriental).

Socio-environmental Measures Adopted by the Concerned Agencies in Addressing the Shortcomings causing the Road Right of Way Obstructions

This portion, measures in terms of social approaches to address the shortcomings in the removal of obstruction in the road-right-of-way demonstrated the social approach rate which is 3.06 (Agree). Added by the respondent's suggestions are; 1. Strengthen monitoring specially during actual cutting operation; and 2. Enforce control over timber transport and disposal. The result shows the importance to focus on the measures to address the short comings in terms of social approach. The implementation of the socio-environmental management system in 2021 considered the right of way in the environmental impact assessment process; this should integrate the procedures in the removal of illegal usurpation and obstruction within the road-right-of-way by proactive mitigation and management, enhanced public participation, identification of vulnerable groups, and long-term monitoring & evaluation. The integration extends by viewing a solution in monitoring tree-cutting activities and environmental compliance certificates, but because of the same challenges experienced in the right of way, it is also needed to examine the mandatory pre-requisite before operations, the need for strict adherence to mitigation measures, enforcement of replacement ratios, stringent verification of permits, and inter-agency coordination.

This portion measures in terms of environmental approaches to address the shortcomings in the removal of obstruction in the road-right-of-way demonstrated the environmental approach rate which is 3.16 (Agree). The result shows the importance to focus on the measures to address the short comings in terms of environmental approach. According to John Glasson (2005), According to John Glasson (2005): 1) The description of the environmental baseline involves establishing both the current and future state of the environment, excluding the effects of the project. This analysis considers changes resulting from natural events and other human activities. 2) Identifying the main impacts integrates the earlier steps to ensure that all potentially significant environmental impacts, both adverse and beneficial, are recognized and taken into account during the process. 3) The prediction of impacts aims to determine the magnitude and other dimensions of the identified changes in the environment caused by a project or action, comparing it with the situation that would exist without that project or action. 4) The evaluation and assessment of significance focus on assessing the relative importance of the predicted impacts, enabling a concentration on the most significant adverse effects.

5. CONCLUSION

In view of the findings, the following conclusions were drawn:

- That the clearing of obstruction is classified and documented according to the DPWH guidelines and the District Summary Report. Mostly, the obstructions removed are for Category A which

corresponds to unfixed objects. This finding will provide the focus on the priority action on removal of obstruction within the RROW in the 2nd District of Albay.

- That there are current practices being done in the clearing of such obstructions. However, shortcomings are also experienced.
- There are socio-environmental measures being adopted by the concerned agencies in encountering the shortcomings caused by clearing obstructions.
- There is a recommended engineering intervention in upscaling socio-environmental approaches in the road obstruction removal.

6. RECOMMENDATIONS

Engineering-based solutions integrates social and environmental sustainability on road right-of-way obstruction removal:

- The improvement of the reporting system on the classification of the categories of obstruction by putting all the type of obstruction, providing legends on letters are used to identify the top most concerns on problem areas in obstructions and provided already the recommended solutions on getting rid of these obstructed materials/structures, so that it will not be merely wants to be disposed has become an end product that covered or utilized by either the DPWH 2nd district of Albay or the stakeholders who might need it.
- The strengthening of coordination among stakeholders so that cling proactive complaints could already be resolved through proper channels. The managing of information and educated campaigns on the road right-of-way obstruction removal, and clean participation of stakeholders in sustaining and clearing of obstructions.
- The adaption of the proposed engineering-based solutions as enumerated in the result and discussion must be enhanced by the DPWH.

Areas for further study are:

The assessment of the management of infrastructure in the 2nd district of Albay. the integration of socio-economic-environmental approaches in the implementation of the infrastructure projects in Albay. Based on the findings and obstructions the following recommendations are crafted:

- The classification and photo documentation of clearing of obstructions shall be fully digitalized per easy access of the information required in the provisions of steadfast actions.
- The socio-environmental practices shall be given attention to provide better implementation required safeguards in the sustainability of the clearing operations.
- The shortcomings and measures be given focus to fully address the requirements of a safe and sustainably clearing of road obstructions.
- The proposed engineering-based solutions on the integrated socio-environmental approaches be given utmost attention to bettering the implementation of a balanced and sustainable clearing of road right-of-way obstructions.

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