

## ENVIRONMENTAL SUPERVISION IN PALM OIL INDUSTRY WASTE MANAGEMENT IN PELALAWAN REGENCY

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Received: 15/06/2026 | Revised: 25/06/2026 | Accepted: 15/07/2026 | Published: 20/07/2026

### Abstract

Environmental monitoring is a crucial instrument for ensuring industrial compliance with waste management, particularly in areas with high palm oil industry activity. This study aims to analyze environmental monitoring in palm oil industrial waste management in Pelalawan Regency. The study employed a descriptive qualitative approach involving twelve informants from the Pelalawan Regency Environmental Agency, palm oil companies, and communities surrounding the industrial area. Data were collected through in-depth interviews and documentation, tested through source triangulation, and analyzed interactively through data reduction, data presentation, and conclusion drawing. The results indicate that environmental monitoring is implemented through a series of preventive and repressive measures that include company guidance, administrative compliance checks, *land application*, field inspections, public complaint handling, and corrective actions. These two forms of monitoring do not occur separately but are interconnected in the process of maintaining company compliance. This study found that the main problem with monitoring lies not primarily in the lack of instruments, but in the inconsistent interconnection between monitoring instruments. Limited inspection frequency impacts the verification and early detection functions, some community information is not yet connected to the government monitoring system, and the dominance of the coaching approach requires more consistent follow-up monitoring. This study emphasizes the importance of integrating compliance information, inspection results, corrective action history, and public complaints to strengthen ongoing environmental oversight.

**Keywords:** environmental monitoring; environmental compliance; industrial waste; palm oil; Pelalawan Regency

### INTRODUCTION

The development of the palm oil industry has positioned this sector as a vital part of Indonesia's economic activity. In various palm oil-producing regions, the presence of processing plants not only supports production activities and the local economy but also generates large amounts of waste. One such waste that requires serious attention is *Palm Oil Mill Effluent* (POME), a liquid waste from the processing of fresh fruit bunches that contains high levels of organic matter. If not managed according to environmental standards, this waste has the potential to degrade water quality and pollute the surrounding environment (Yoeliarniza et al., 2025). This situation indicates that the growth of the palm oil industry requires environmental monitoring to ensure company compliance with waste management regulations.

Environmental oversight is a crucial component of regional environmental protection and management. Local governments are not only required to establish environmental regulations but also to ensure that industrial activities comply with applicable documents, technical approvals, and environmental management standards. In this context, the Environmental Agency (DLH) plays a strategic role in providing guidance, monitoring, inspections, and corrective action against business activities that have the potential to cause pollution. Therefore, oversight should not be solely carried out after violations occur, but should also be directed at preventative measures to control pollution risks from the outset. This oversight issue is particularly relevant in Pelalawan Regency, a region with growing palm oil industry activity in Riau Province. The presence of palm oil processing plants makes waste management an environmental issue requiring local government attention. Nationally, environmental management and oversight obligations are regulated by Law Number 32 of 2009 concerning Environmental Protection and Management and

Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management, which serve as the basis for local governments to carry out their oversight function over business activities that have the potential to cause pollution. At the regional level, Pelalawan Regency Regional Regulation Number 1 of 2023 concerning Control of Environmental Pollution and Damage authorizes local governments to carry out guidance, supervision, and enforcement of business activities that have the potential to cause pollution. However, the existence of regulations and oversight authority has not automatically eliminated the problem of industrial waste management.

A number of pollution issues remain prevalent in the palm oil industry in Pelalawan Regency. For example, a leak in a waste pipe at PT Sari Lembah Subur reportedly caused waste to overflow into the Tanglo River in Pangkalan Lesung District (Rafles, 2024). Furthermore, several palm oil mills are suspected of discharging liquid waste into rivers without the required Technical Approval (Pertek) and Operational Eligibility Letter (SLO) (RiauTribune.com, 2025). These cases highlight the gap between environmental management regulations and waste management practices at the company level. At this point, environmental issues are not only related to the company's ability to process waste, but also to how local government oversight is implemented to prevent, detect, and respond to non-compliance.

Studies on palm oil industry waste monitoring have revealed various challenges in the implementation of local government oversight functions. Mulyani and Ishak (2016) identified challenges in palm oil industry waste monitoring in Pelalawan Regency, while Indriyani and Sadad (2023) highlighted various obstacles faced by the Environmental Agency in monitoring palm oil waste management in Kuantan Singingi Regency. These studies provide insight into the challenges of environmental monitoring, but further elucidation is needed on how local governments implement a combination of preventive and corrective measures in their monitoring practices. Environmental monitoring is not solely determined by the intensity of inspections but also by company guidance, verification of administrative compliance, responses to public complaints, and actions taken when non-compliances are found.

Based on these issues, this study analyzes environmental oversight in the management of palm oil industrial waste in Pelalawan Regency. Supervision is understood through two forms of action: preventive supervision aimed at preventing deviations and repressive supervision carried out in response to detected non-conformities or violations. Through this perspective, this study seeks to explain how the Pelalawan Regency Environmental Agency (DLH) carries out environmental oversight amidst the complexity of palm oil industrial activities and various limitations in its implementation. This study emphasizes that environmental oversight needs to be understood as a series of actions that connect guidance, compliance verification, field inspections, response to complaints, and corrective actions in maintaining compliance with industrial waste management.

## RESEARCH METHODS

This study uses a descriptive qualitative approach to understand the implementation of environmental monitoring in the management of palm oil industry waste in Pelalawan Regency. This approach was chosen because the study focuses on monitoring practices carried out by the Environmental Agency (DLH), including preventive measures, compliance checks, responses to environmental issues, and corrective actions against companies. The study location is in Pelalawan Regency, Riau Province, with a focus on the Pelalawan Regency DLH as well as companies and communities involved in palm oil mill waste management.

The research informants were determined *purposively* based on their involvement and knowledge regarding the supervision and management of palm oil industrial waste. The study involved twelve informants consisting of four officials from the Pelalawan Regency Environmental Agency (DLH): an Environmental Health Administrator, a Junior Expert Environmental Supervisor, an DLH Secretary, and the Head of the Environmental Management and Maintenance Division. Informants from the company consisted of two people from PT Makmur Andalan Sawit and PT Serikat Putra. In addition, six community members living around the palm oil mill area were involved to obtain information regarding environmental conditions and community experiences with waste management practices.

Data were collected through in-depth interviews and documentation. Interviews were conducted to obtain information on oversight mechanisms, company development, environmental document review, field inspections, complaint handling, and actions taken against non-compliances in waste management. Information from DLH officials was compared with statements from the company and the community to determine whether there were any agreements or differences in views regarding the implementation of oversight. Documentation was used to supplement and corroborate the information obtained during the research process. Data validity was verified through source triangulation, comparing information from DLH officials, companies, and the public. This process ensured that interpretations of supervisory practices were based not only on the perspective of the government as the

supervisory implementer, but also took into account the experiences of the parties being monitored and the communities surrounding the industrial area. Data analysis was conducted interactively through a process of data reduction, data presentation, and conclusion drawing as developed by Miles and Huberman (1984). Interview data were first selected and grouped based on the patterns of supervisory actions found in the field. Next, the data were analyzed using Irawan's (2000) supervisory framework, which distinguishes between preventive and repressive supervision. Preventive supervision is used to identify actions aimed at preventing deviations before pollution occurs, while repressive supervision is used to analyze inspections, responses, and corrections after activities have taken place or when non-conformities are discovered. This framework serves as an analytical tool for understanding environmental monitoring practices carried out by the Pelalawan Regency Environmental Agency (DLH), not simply for classifying supervisory activities.

## RESULTS AND DISCUSSION

Environmental oversight of palm oil industry waste management in Pelalawan Regency demonstrates a series of actions that extend beyond the discovery of violations. Research shows that the Pelalawan Regency Environmental Agency (DLH) conducts oversight through company guidance, administrative compliance checks, waste management monitoring, field inspections, public complaint handling, and corrective action. In practice, preventive and repressive oversight do not always operate as separate processes. They are interconnected, forming a pattern of oversight that evolves based on company conditions and environmental issues encountered in the field.

### Coaching as an Initial Instrument for Environmental Compliance

Environmental oversight of the palm oil industry in Pelalawan Regency begins with guidance and outreach to companies. The Pelalawan Regency Environmental Agency (DLH) regularly communicates environmental management regulations and company obligations regarding waste management. This guidance is not limited to formal outreach activities but also occurs concurrently with field monitoring. When officers identify practices that do not comply with regulations, companies are provided with explanations and guidance on necessary actions to improve environmental management.

The Head of the Environmental Management and Maintenance Division of the Pelalawan Regency Environmental Agency (DLH) explained that the guidance was provided by providing companies with an understanding of permitted and prohibited actions in environmental management. Routine outreach programs were considered to have helped encourage companies to understand applicable regulations. These practices also included education, technical guidance, mentoring, and evaluation of the company's environmental management. From the company's perspective, an informant from PT Serikat Putra acknowledged that DLH officers frequently provided guidance on waste management during field inspections.

These findings demonstrate that coaching has become the initial instrument used by the Environmental Agency (DLH) to build corporate compliance. From Irawan's (2000) perspective, this practice reflects the nature of preventive supervision, as supervisory actions are aimed at reducing the likelihood of deviations before they develop into environmental pollution. However, research findings indicate that coaching in Pelalawan Regency does not occur as a complete prelude to supervision. Instead, coaching is embedded within the inspection process and the interaction between supervisory officers and companies. In other words, the preventive function is implemented through a recurring supervisory process.

This pattern demonstrates that environmental compliance is not always achieved solely through the existence of regulations and the threat of sanctions. Companies also require a process of translating environmental provisions into operational practices. In this context, coaching provides a space for DLH officers to explain standards, identify errors, and guide companies in making adjustments. This finding aligns with Santoso's (2017) view that environmental oversight needs to focus on prevention and monitoring to identify environmental issues before they develop into more serious pollution.

However, the predominance of coaching within the supervisory process also demonstrates the corrective-persuasive nature of the supervisory relationship. When non-compliances are discovered, the government's initial response is directed more toward providing explanations, mentoring, and opportunities for companies to make improvements. This approach can strengthen compliance if companies are committed to following up on the coaching results. Conversely, if not accompanied by verification of improvements made, coaching has the potential to cease as just directives without any certainty regarding changes to company practices. At this point, the research findings expand the understanding of preventive supervision proposed by Irawan (2000). Preventive supervision in palm oil industry waste management in Pelalawan Regency takes the form of actions not only before activities take place, but also develops into coaching embedded within the supervisory process. Prevention occurs through repeated

interactions between supervisors and companies to ensure waste management practices remain within environmental regulations. Therefore, the effectiveness of coaching as a compliance instrument is determined not only by the intensity of outreach but also by its connection to the inspection, evaluation, and verification of company follow-up actions.

### Administrative Compliance as a Gateway to Supervision

Environmental oversight of palm oil industry waste management in Pelalawan Regency also relies on audits of companies' administrative compliance. The Pelalawan Regency Environmental Agency (DLH) examines companies' environmental documents, such as AMDAL (Environmental Impact Assessment), UKL-UPL (Environmental Management Plan), and SPPL (Environmental Management Plan) according to the characteristics and scale of their business activities. The audit also includes Technical Approvals (Pertek) and Operational Feasibility Letters (SLO) related to pollution control and wastewater management. The completeness of these documents serves as the entry point for officers to assess each company's environmental obligations.

The research results show that the monitoring process begins with the issuance of a task order, which serves as the basis for officers to conduct inspections. Initially, officers review the company's environmental documents and technical approvals before verifying field conditions. The inspection results are then documented in a report signed by the officer and the company. If a company is found to have failed to meet the requirements, the Environmental Agency (DLH) issues a warning and requests that the company immediately complete the necessary documentation. Under certain circumstances, operational activities may be temporarily suspended until these requirements are met.

This practice demonstrates that environmental documents serve as both an administrative basis and a reference for implementing oversight. Through these documents, officers can identify the standards, obligations, and forms of environmental management that a company should implement. Within Irawan's (2000) preventive oversight framework, checking administrative requirements can be understood as a measure to prevent business activities from proceeding without a clear basis and standards for environmental management. Thus, administrative compliance is the initial step in establishing order in industrial waste management.

However, research also shows that the possession of environmental documents does not always directly correlate with compliance with waste management practices. Allegations of liquid waste discharge by several factories lacking Pertek and SLO demonstrate that compliance issues can persist even after a company's operations are underway. This situation highlights the gap between government-imposed administrative requirements and industry operational practices. Therefore, environmental oversight cannot stop at verifying the existence of documents but needs to ensure alignment between the obligations stated in the documents, company reports, and the actual state of waste management.

These findings demonstrate the limitations of a supervisory approach that relies too heavily on administrative compliance. Murhaini (2014) positions government oversight as an instrument to ensure that activities are carried out in accordance with legal norms and accountability principles. In environmental oversight, such compliance is not sufficiently demonstrated through complete documentation. Compliance acquires substantive meaning when a company actually implements environmental management standards in its operations. Therefore, environmental documents are more appropriately understood as a basis for verification rather than as final proof of a company's compliance.

This situation also demonstrates the crucial relationship between administrative oversight and field supervision. Document inspections provide information on what a company is supposed to do, while field inspections demonstrate how those obligations are implemented in practice. When these two instruments are not closely linked, oversight risks producing procedural compliance. A company may meet administrative requirements, but its waste management practices may not fully align with its established environmental commitments.

This research demonstrates that administrative compliance is the entry point, not the endpoint, of environmental oversight. This position broadens the understanding of preventive oversight, which is directed not only at checking requirements before activities begin, but also at continuously verifying the implementation of a company's environmental obligations. Thus, the strength of oversight lies in the DLH's ability to connect documents, reports, and field conditions as a single set of compliance checks. Without such a connection, administrative oversight has the potential to result only in formal compliance that does not fully reflect the quality of environmental management.

### Land Application and Shifting Waste Management Approaches

*Land application* has become a key practice in the management of liquid waste from the palm oil industry in Pelalawan Regency. This practice utilizes processed liquid waste and applies it to plantation land. Unlike the practice of discharging wastewater into water bodies, *land application* treats waste as a reusable material after meeting certain

technical requirements. This change demonstrates a shift in waste management approaches from disposal to more controlled utilization. The research results show that *land application* evolved from concerns about the risks of discharging liquid waste into water bodies. An informant from the Pelalawan Regency Environmental Agency (DLH) explained that the practice of discharging wastewater into rivers has the potential to degrade water quality and disrupt biota. Through *land application*, treated liquid waste can be channeled to the application area as long as it meets the required quality requirements. In practice, companies process wastewater through a series of ponds before using the waste on plantations.

This practice is evident at PT Makmur Andalan Sawit, which processes liquid waste through several treatment ponds, ranging from anaerobic to aerobic processes to sedimentation. The treatment process is carried out before the waste is discharged to the application area. From the company's perspective, this mechanism is part of the liquid waste management process, which is carried out to comply with environmental regulations. Meanwhile, the surrounding community has positively assessed the use of the treated waste, as it is considered to improve land fertility. One community informant also explained that the *land application process* was discussed with the community prior to implementation.

These findings demonstrate that preventive oversight does not always take the form of prohibitions on company activities. From Irawan's (2000) perspective, prevention aims to reduce the likelihood of deviations before they cause greater impacts. In the case of *land application*, the preventive function occurs through directing waste management practices toward more controlled mechanisms. The government not only monitors what companies are not allowed to do but also ensures that alternative waste management practices are implemented in accordance with environmental requirements.

This shift is significant because it demonstrates a shift in orientation in the relationship between oversight and waste management. Oversight is no longer solely positioned as a mechanism for detecting violations, but also plays a role in encouraging adjustments in company practices. In this context, *land applications* demonstrate that environmental compliance can be established through a combination of technical standards, waste treatment, and utilization of the resulting products. Waste is no longer positioned solely as residue to be disposed of, but as a material that can be utilized as long as its environmental risks are controlled.

However, the benefits of *land application* do not automatically eliminate the risk of pollution. Wastewater utilization is highly dependent on the quality of the processed product and the company's consistency in meeting technical requirements. The high organic content of palm oil industry wastewater can put pressure on the environment if the processing and application processes are not carried out properly. Therefore, the shift from disposal to waste utilization places increased importance on waste quality monitoring. Monitoring of the processing process, test results, and the condition of the application area is necessary to ensure that waste utilization does not transfer the risk of pollution from water bodies to other environmental media.

At this point, the research findings demonstrate a close relationship between waste management innovation and government oversight capacity. *Land application* offers a more adaptive management approach than direct discharge into water bodies, but its success still depends on the Environment Agency's ability to verify company compliance. Therefore, innovation in waste management does not diminish the need for oversight. On the contrary, the more complex the waste utilization mechanisms implemented, the greater the need for oversight that understands the administrative and technical aspects of environmental management.

This study confirms that *land application* represents a shift in the approach to waste management in the palm oil industry in Pelalawan Regency, from a disposal-oriented approach to controlled utilization. However, the significance of this shift lies not only in the utilization of waste for plantation land. The research findings indicate that changes in waste management practices simultaneously change the need for environmental monitoring. Monitoring is not sufficient to ensure that companies do not discharge waste into water bodies; it must also be able to verify waste quality, processing processes, and utilization practices on the land. Thus, *land application* expands the scope of supervision from controlling waste disposal to monitoring the entire waste utilization process.

## Field Inspections Amid Limited Supervision Reach

Field inspections are a crucial tool in monitoring waste management in the palm oil industry in Pelalawan Regency. Through inspections, the Pelalawan Regency Environmental Agency (DLH) assesses the condition of wastewater treatment plants and waste management facilities, as well as the alignment of environmental documents with company practices. Monitoring also includes wastewater and emissions sampling to obtain information on the company's environmental management practices. Thus, field inspections serve as a means of verifying information previously obtained through company documents and reports.

The research results show that inspections are conducted through supervisory teams with different functions. Regional supervisory teams conduct routine inspections of companies, while other teams handle public complaints. During field inspections, officers not only review the completeness of documents but also directly observe the condition of facilities and waste management practices. Information in company reports is then compared with actual conditions to identify potential discrepancies.

The existence of field inspections demonstrates that environmental oversight requires direct government presence at industrial sites. Company documents and reports provide information on environmental management obligations and implementation, but both still require verification. From Irawan's (2000) perspective, these inspections reflect a repressive oversight function because activity implementation is compared to established standards and serves as the basis for corrective action if deviations are found. However, research findings indicate that the function of inspections is not limited to identifying violations. Inspections also serve as an instrument for linking administrative compliance with waste management practices in the field.

The main issue arises from the intensity of inspections. Research shows that ideally, inspections should be conducted three times a year: at the beginning, middle, and end of the year. In practice, budget constraints mean that inspections are often only conducted once a year. The number of officers involved in a team also ranges from four to five. This situation is exacerbated by the numerous palm oil industry activities requiring oversight in Pelalawan Regency. As a result, existing oversight mechanisms are not always implemented with the planned intensity.

These findings demonstrate a gap between oversight design and implementation capacity. Procedurally, the Environmental Agency (DLH) has established inspection mechanisms, designated teams, and established oversight targets. However, its ability to conduct routine inspections is limited by budget and personnel availability. This aligns with findings by Indriyani and Sadad (2023), who found that industrial waste oversight can face challenges in terms of resources and scope. In the Pelalawan context, these limitations do not eliminate oversight, but rather reduce the intensity of government involvement in verifying companies' waste management practices.

Limited inspection frequency has important implications for the detection function of environmental oversight. When inspections are conducted only at long intervals, waste management non-compliances may not be immediately identified through routine monitoring. Environmental issues can develop between one inspection period and the next. Therefore, inspection frequency is not simply a matter of achieving annual activity targets, but also relates to the government's ability to detect changes and deviations in waste management practices early.

On the other hand, the limited scope of inspections also indicates that environmental oversight cannot rely solely on routine government visits. Santoso (2017) emphasized the importance of environmental inspections and monitoring as part of pollution prevention measures. However, when inspection capacity is limited, the government needs other sources of information that can help identify risks and determine oversight priorities. Company reports, environmental testing results, history of non-compliance, and community information can be used to direct oversight attention to companies or locations with greater potential for problems.

In this context, the research findings indicate the need for more risk-focused oversight. Findings regarding budget and personnel limitations suggest that increased oversight does not always translate into uniformly increasing the number of inspections across all companies. When oversight resources are limited, information about a company's compliance, its history of findings, and environmental complaints becomes crucial in determining the intensity of inspections. This approach allows available oversight capacity to be directed toward industry activities that require greater attention.

This research confirms that the problem with environmental inspections in Pelalawan Regency lies not in the absence of a monitoring mechanism, but rather in the gap between the need for monitoring and the capacity to implement it consistently. Limited inspection frequency and scope impact the Environmental Agency's ability to verify and detect early non-compliance with waste management. Therefore, strengthening inspections requires not only resource support but also access to information that can help determine monitoring priorities. Under limited capacity, the ability to select locations and activities that require more intensive monitoring is crucial for effective environmental oversight.

## Public Complaints as Oversight That Is Not Yet Fully Connected

The limited scope of inspections places public information as a crucial element in environmental monitoring. Communities living near industrial areas interact directly with changes in environmental conditions and can be the first to notice odors, changes in water conditions, or other environmental disturbances. In the context of palm oil industry waste management in Pelalawan Regency, public complaints are one source of information used by the Environmental Agency (DLH) to identify suspected environmental issues beyond routine monitoring activities.

The research results indicate that the Pelalawan Regency Environmental Agency (DLH) has a mechanism for following up on public complaints through field verification. DLH informants explained that reports received are followed up within three days at the latest by deploying a team to the location. Verification is conducted to confirm the reported conditions and determine necessary actions. For pollution issues related to other areas, the Pelalawan Regency Environmental Agency also coordinates with the Siak Regency Environmental Agency and the Riau Province Environmental Agency to conduct joint inspections. This practice demonstrates that complaints can stimulate oversight beyond the planned inspection schedule.

The role of complaints becomes increasingly important when routine inspections are not being implemented as frequently as needed. Under these circumstances, public information can expand the government's ability to understand environmental issues surrounding industrial activities. Nurhidayah (2022) positions public involvement as part of participatory environmental monitoring, as it can exercise social control over activities that have the potential to cause pollution. Research in Pelalawan Regency supports the importance of this function but also demonstrates that public information is not yet fully connected to the government's oversight system.

Some community complaints are still conveyed directly to the company. For example, residents near PT Serikat Putra once complained about odors emanating from waste management. The company responded by adding a retention pond, which resulted in improved odor control compared to the factory's initial operations. The company's response demonstrates that direct communication between the community and the company can lead to corrective action.

However, resolving complaints directly at the company level has implications for government oversight. When information about environmental disturbances is not submitted to the Environmental Agency's (DLH) complaint mechanism, the issue may not be recorded as part of the company's oversight record. The government may lose information about the types of complaints raised, the frequency of the issues, the company's remedial actions, and the likelihood of similar complaints occurring in the future. Thus, the problem lies not in direct communication between the community and the company, but in the disconnection of all this information to the government's environmental oversight system.

These findings indicate the existence of oversight that occurs outside the formal mechanisms of the Environmental Agency (DLH). Communities identify environmental disturbances, file complaints with companies, and the companies take corrective action without always involving the government in the process. On the one hand, this pattern demonstrates the company's ability to respond to issues in its environment. On the other hand, government oversight is less informed about the issues that arise and the process of resolving them. As a result, the DLH's knowledge of a company's compliance status may be largely shaped by inspection results and formal complaints, while issues resolved informally do not always become part of the oversight report.

From Irawan's (2000) perspective, repressive oversight is conducted to identify non-conformities and encourage corrective action after activities have taken place. The research findings show that this corrective function is not solely carried out through the actions of the Environmental Agency (DLH). Communities and companies also shape the response space to environmental issues. This finding broadens the understanding of repressive oversight by demonstrating that information about irregularities can emerge from outside the formal government oversight structure. However, the effectiveness of this information as part of public oversight depends on the government's ability to connect it to the processes of verification, recording, and follow-up monitoring.

This situation becomes even more relevant when the Environmental Agency's inspection capacity is limited. Public information should not only serve as a basis for responding to complaints after they are received, but can also be used to identify environmental risk patterns. Repeated complaints about a particular company or location can indicate activities requiring more intensive oversight. Thus, public complaints have the potential to connect community environmental experiences to government oversight priorities.

This study confirms that public complaints in Pelalawan Regency have served as a trigger for supervisory responses, but have not yet become a fully integrated part of the environmental oversight system. Some information on environmental issues still stops at the direct line between the community and companies. Given the limited scope of inspections, this disconnect can hinder the Environmental Agency's ability to build a more comprehensive picture of company compliance and waste management issues. Therefore, strengthening environmental oversight requires not only easily accessible complaint channels but also mechanisms for recording, verifying, and utilizing public information as part of determining oversight priorities.

### Corrective Action and the Dominance of the Coaching Approach

Corrective action becomes part of environmental monitoring when the Pelalawan Regency Environmental Agency (DLH) finds non-conformities in a company's waste management. Research shows that actions are

implemented in stages, depending on the nature and severity of the problems identified. These actions can include warnings, providing corrective notes, coaching, and even temporarily suspending operations under certain circumstances. This pattern demonstrates that the response to non-conformities does not always involve imposing severe sanctions, but begins with encouraging the company to make improvements.

Environmental Agency (DLH) informants explained that violations deemed minor are generally followed up with warnings and guidance. Companies are asked to correct non-compliances within a specified timeframe based on the inspection results. Meanwhile, more severe actions, including permit revocation or legal proceedings, are within the authority of the provincial or central government. Until the study was conducted, the Pelalawan Regency DLH's actions against companies mostly consisted of warnings, administrative warnings, and instructions for improvement.

This pattern is also evident in the company's experience. When officers discover non-conformities, the inspection results are presented in the form of notes that require follow-up. One example relates to the inadequate arrangement of hazardous and toxic waste storage facilities. Officers provide notes on areas that need improvement, and the company is given the opportunity to make adjustments. The level of improvement can vary depending on the severity of the issues identified during the inspection.

These findings indicate that corrective actions in environmental monitoring in Pelalawan Regency have a strong developmental character. From Irawan's (2000) perspective, repressive monitoring is conducted after activities are underway to compare implementation with standards and take corrective action when deviations are found. The research findings show that this repressive function is translated more into corrections to company practices than punishment. Thus, corrective actions serve as a mechanism to restore environmental management to established standards.

The predominance of a coaching approach indicates that the supervisory relationship between the Environmental Agency (DLH) and companies tends to be geared toward restoring compliance. Warnings and corrective actions provide companies with the opportunity to adjust operational practices before more severe measures are implemented. This approach can help expedite the remediation of technical and correctable non-compliances. In this context, corrective actions serve not only as a consequence for non-compliance but also as an instrument to encourage changes in environmental management practices.

However, the coaching approach has limited effectiveness. Reprimands and corrective notes do not necessarily guarantee that non-conformities have been resolved. The effectiveness of corrective actions depends on verification of the company's follow-up actions. Without follow-up inspections, it is difficult for the government to determine whether the monitoring results have translated into changes in waste management practices. This is crucial given the limited frequency of DLH inspections. Long monitoring intervals can impact the ability of officers to consistently monitor the completion of corrective actions.

These findings demonstrate the relationship between corrective action and supervisory capacity. When a coaching approach becomes the primary instrument, the ability to conduct follow-up monitoring becomes even more necessary. Murhaini (2014) emphasized that government oversight does not stop at identifying non-conformities, but rather involves corrective actions to ensure that activities are implemented in accordance with regulations. In the Pelalawan context, the success of a coaching approach is therefore not solely measured by the number of warnings or directives issued, but rather by the supervisor's ability to ensure that the company actually completes the requested improvements.

On the other hand, the predominance of guidance measures also needs to be interpreted in the context of the division of environmental oversight authority. The limited authority of the district government in implementing certain measures results in some of the more severe sanctions being imposed at other levels of government. This situation indicates that the effectiveness of compliance enforcement does not depend entirely on the actions of the Pelalawan Regency Environmental Agency (DLH). When issues require handling beyond the district's authority, the link between regional oversight and enforcement authority at the provincial or central level becomes crucial. Without clear follow-up coordination, regional-level oversight findings may not immediately translate into appropriate action commensurate with the severity of the violation.

At this point, the research findings indicate that the issue of corrective action is not solely about the severity of sanctions. More important is the continuity between supervisory findings, corrective action, follow-up verification, and escalation of action if non-conformities are not resolved. This sequence determines whether the coaching approach truly results in compliance or simply becomes a repetitive administrative response to the same problem.

This study confirms that corrective actions in monitoring palm oil industry waste management in Pelalawan Regency are predominantly directed at fostering and restoring company compliance. This approach allows companies to correct non-compliances, but its effectiveness depends heavily on the Environment Agency's ability to verify follow-up actions and link monitoring results to more stringent actions when corrections are not made. Therefore, the

strength of corrective actions lies not only in the existence of sanctions, but also in the consistency of the chain of custody from findings, corrections, verification, and escalation of action.

### Synthesis of Environmental Monitoring in Palm Oil Industrial Waste Management

The research findings demonstrate that environmental monitoring in Pelalawan Regency does not occur through a single, stand-alone instrument. Guidance, administrative audits, waste management through *land application*, field inspections, public complaints, and corrective actions form an interconnected monitoring framework. To demonstrate the relationship between the findings and their analytical significance, a synthesis of the research results is presented in Table 1.

**Table 1. Synthesis of Environmental Monitoring Findings in Palm Oil Industry Waste Management**

| Dimensions of Supervision | Key Findings                                                                                               | Analytical Problems                                                                                                      | Meaning for Environmental Monitoring                                                                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Corporate development     | Socialization, technical guidance, and direction take place simultaneously with field supervision.         | Coaching is not completely separate from the inspection process.                                                         | Preventive supervision develops through repeated interactions between the supervisor and the company.                                         |
| Administrative compliance | AMDAL, UKL-UPL, SPPL, Pertek and SLO examinations are the basis for supervision.                           | Completeness of documents does not always reflect compliance in practice                                                 | Documents are the entry point for verifying a company's substantive compliance.                                                               |
| <i>Land application</i>   | Processed liquid waste is used on plantation land                                                          | Utilization of waste still has risks if the quality and application process are not monitored.                           | The shift from disposal to utilization expands the scope for environmental oversight.                                                         |
| Field inspection          | Inspection of documents, facilities, field conditions and sampling is carried out by the supervisory team. | The target of three monitoring sessions per year is often only carried out once due to budget and personnel limitations. | Capacity limitations impact the verification and early detection functions of supervision.                                                    |
| Public complaints         | DLH verifies complaints, but some complaints are submitted directly to the company.                        | Environmental information is not entirely included in the government monitoring system.                                  | Public complaints have the potential to expand the scope of supervision if they are connected to the supervision information system.          |
| Corrective action         | Reprimands, coaching, improvement notes, and gradual actions are more dominantly used.                     | Corrective actions require verification and escalation if nonconformities recur.                                         | The effectiveness of corrective action is determined by the continuity between findings, corrections, verification, and escalation of action. |

Source: Researcher's Process, 2026

Table 1 shows that environmental monitoring in Pelalawan Regency essentially has instruments that encompass both prevention and corrective action. However, the problems identified are not primarily related to the lack of oversight instruments. Challenges arise from the interrelationships between these instruments. Administrative compliance requires field verification, limited inspections require public information support, and corrective action requires monitoring of company improvements.

The research results thus demonstrate that preventive and repressive supervision, as proposed by Irawan (2000), do not operate as two entirely separate forms of supervision. Guidance can occur during inspections, administrative audit results serve as the basis for field verification, and corrective actions are directed toward guidance and compliance restoration. This relationship demonstrates that environmental oversight practices evolve as a series of actions that move between prevention, inspection, correction, and re-monitoring of company compliance.

The main problem arises when the chain is not fully connected consistently. Limited inspection frequency impacts the DLH's ability to conduct routine verification, while some information regarding environmental

disturbances still stops at the direct contact between communities and companies. At the same time, the dominant coaching approach requires the ability to ensure that corrective actions are actually followed up. This situation suggests that the effectiveness of supervision is determined not only by the existence of regulations, the number of coaching activities, or the issuance of warnings, but also by the continuity of information and action throughout the entire supervision process.

This study confirms that environmental monitoring of palm oil industry waste management in Pelalawan Regency faces issues of interconnectedness among monitoring instruments. Oversight has shifted from administrative inspections to field verification and from waste disposal to utilization through *land application*. However, these developments have also expanded the government's information and verification needs. Given limited inspection capacity, information on company compliance, inspection results, corrective action history, and public complaints must be part of an interconnected monitoring framework.

Overall, strengthening environmental oversight cannot be achieved simply by increasing inspections or increasing sanctions. Oversight requires a link between guidance, administrative compliance, field verification, public information, and monitoring of corrective actions. This linkage is crucial to ensure that oversight is not a series of isolated administrative activities, but rather a continuous process to detect risks, ensure improvements, and maintain company compliance in the management of palm oil industry waste.

## CONCLUSION

This study shows that environmental monitoring of palm oil industry waste management in Pelalawan Regency is implemented through a series of interconnected preventive and repressive measures. Company guidance, administrative compliance audits, and *land application* form the basis for preventing pollution risks. Meanwhile, field inspections, public complaint handling, and corrective actions are used to identify and respond to non-compliances in waste management practices. In practice, these two forms of supervision do not occur separately. Guidance is embedded in the inspection process, environmental documents form the basis for field verification, and corrective actions are directed back toward improving company compliance.

This study confirms that the environmental oversight problem in Pelalawan Regency lies not primarily in the absence of oversight instruments, but rather in the inconsistent interconnectedness between these instruments. Limited inspection frequency impacts the Environmental Agency's (DLH) ability to conduct verification and early detection; some public information has not yet been entered into the government oversight system; and the dominant development approach requires monitoring capable of ensuring follow-up to company improvements. These conditions indicate that the effectiveness of oversight is determined by the continuity between information, inspections, corrective actions, and verification towards restoring compliance.

Therefore, strengthening environmental oversight needs to be directed at integrating company compliance information, inspection results, corrective action history, and public complaints as a basis for determining oversight priorities. Given limited oversight capacity, the connectivity of this information is crucial for strengthening early detection and ensuring follow-up on non-compliances. This way, environmental oversight can evolve from a series of separate administrative activities to a continuous oversight process to ensure compliance with palm oil industry waste management.

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