Evaluating *Joint Operations* as a Managerial Intervention to Improve Cost Reduction and Governance Effectiveness

An Action Research Study of PT X and PT Y, Berau, East Kalimantan

INDIVIDUAL PROJECT

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MASTER OF BUSINESS ADMINISTRATION

IPMI INSTITUTE

JAKARTA

2026

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AN INDIVIDUAL PROJECT THESIS

Submitted in partial fulfilment of the requirements for the degree of

Master of Business Administration

CERTIFICATE OF APPROVAL

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We hereby declare that this Thesis is from student's own work, has been read and presented to IPMI Institute's Board of Examiners, and has been accepted as part of the requirements needed to obtain a Master of Business Administration Degree and has been found to be satisfactory.

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This Individual Project Thesis is a presentation of our original research work. Wherever contribution of others is involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussion.

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Jakarta, June 29, 2026

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ABSTRACT

This study evaluates the effectiveness of *Joint Operations* (JOs) as a managerial intervention to improve structural cost saving and governance effectiveness in natural forest concession companies (PBPH) in Indonesia. The research focuses on two adjacent PBPH entities, PT X and PT Y, operating under the same holding structure and facing structural cost pressures arising from duplicated support functions and increasing regulatory and sustainability compliance requirements. Using an *Action Research* approach, the study integrates four analytical instruments: *Functional Overlap Analysis (FOA), Structural Cost Analysis (SCA), Joint Operations Financial Analysis (JOFA), and Governance Effectiveness Index (GEI).* The findings indicate that the JOs structure can reduce duplication in planning, compliance, administration, logistics, and sustainability functions. The SCA simulation shows a reduction in the overhead cost ratio from 8% under standalone operations to 5% under the JOs scenario, while JOFA results demonstrate structural cost savings of 12.8%, equivalent to approximately IDR 7.43 billion. Governance assessment results indicate improved *reporting-line clarity*, *coordination efficiency*, and *transparency of cost accountability* while maintaining regulatory compliance. The novelty of this study lies in the development of an integrated managerial evaluation framework combining FOA, SCA, JOFA, and GEI to assess both financial and governance implications of JOs in natural forest concessions, a context that has received limited attention in prior research. However, the study is limited to an *ex-ante assessment* operating under a single holding company and may not fully represent conditions in other forestry organizations or actual post-implementation outcomes.

***Keywords**: Joint Operations, Structural Cost, Governance Effectiveness, Action Research, PBPH.*

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CHAPTER 1
INTRODUCTION

1.1 Industry Background

Indonesia's natural forest concession (formerly known as HPH/IUPHHK-HA and currently called as PBPH [1]) industry is undergoing a structural transition. Historically, timber harvesting from PBPH relied on *selective logging* under a cost structure primarily driven by field operations. Today, however, concession holders operate under increasing sustainability obligations, including *sustainable forest management* (SFM) certification, *Reduced Impact Logging* (RIL), compliance monitoring, and *social safeguards*. These obligations are not optional, yet they are embedded in regulatory and market expectations.

For companies operating under the PBPH framework, this shift creates a practical dilemma, how to comply with regulations and sustainability standards while maintaining financial viability. Unlike plantation forestry (HTI[2]), where rotation cycles and production planning are more predictable, natural forest harvesting is inherently selective and geographically dispersed. Operational intensity is lower, but coordination and compliance requirements are higher. As a result, structural and overhead costs have become increasingly high relative to production output.

Nevertheless, PBPH's natural forest concession remains essential for supplying *high-value hardwood*, supporting rural livelihoods development, protecting biodiversity and maintaining *landscape-level forest functions*, despite the growing dominance of HTI in industrial pulpwood production (FAO, 2023). Furthermore, Indonesian policy increasingly expects forestry companies to function as *multi-function landscape* managers rather than *single-purpose timber producers* (MoEF, 2021). This is reflected in the *Multi Usaha Kehutanan (MUK)* framework, which integrates timber harvesting with ecosystem service delivery (MoEF, 2021).

Regulatory developments such as Ministry of Environment and Forestry (MoEF) Regulation No. 8/2021 and Presidential Regulation No. 110/2025 highlight a strategic shift toward *market-based* forest management, carbon financing, and sustainability performance (MoEF, 2021; Government of Indonesia, 2025).

[1] HPH/IUPHHK-HA is abbreviation from Hak Pengusahaan Hutan/Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Alam. PBPH is abbreviation from Perizinan Berusaha Pemanfaatan Hutan
[2] HTI is abbreviation from Hutan Tanaman Industri (*plantation forestry*)

Historically, PBPH natural forest concession operators in Indonesia face structural cost pressures:

- Rising operational costs, particularly for compliance, inventory planning, and enforcement of sustainability standards (World Bank, 2019).
- Selective extraction economics (*selective logging-RIL*), resulting in lower wood volumes per hectare compared to HTI (FAO, 2022).
- Fixed overhead related to sustainability requirements, including biodiversity and vegetation monitoring, forest protection, social-conflict mitigation programs, social safeguard and certification processes (MoEF, 2021; FSC, 2023).

Compared with HTI, timber harvesting in natural forests consistently exhibit higher cost per unit of output (m3), primarily due to structural and operational characteristics inherent to selective logging systems. HTI benefits from homogeneous stands, planned rotations, and mechanized harvesting. In contrary, PBPH natural forest operate under low extraction intensity, complex terrain, and dispersed timber distribution, resulting in higher planning, harvesting, and logistics costs per cubic meter (FAO, 2022; World Bank, 2019).

Empirical studies and industry assessments indicate that logging intensity in natural forests is typically below 10 m^3 per hectare, compared to plantation forests that may yield several times that volume in a single harvesting cycle. This low yield density increases the cost burden associated with road construction, pre-harvest inventory, supervision, and forest protection when calculated on a per-unit basis (FAO, 2022). In addition, PBPH's natural forest operations are mostly located in remote areas with limited infrastructure, leading to higher transportation costs, longer hauling distances, and increased fuel consumption—factors that further elevate unit costs (World Bank, 2019).

Cost disparities are further widened by sustainability and compliance requirements that disproportionately affect PBPH natural forest concession. Moreover, RIL practices, Sustainable Forest Management (SFM) certification, biodiversity protection, and social obligations give additional costs that are largely independent of annual production volume. Empirical evidence suggests that the adoption of RIL practices alone can increase operational harvesting costs by approximately 15–30%, depending on site conditions and implementation intensity, particularly during the early stages of adoption (Pinard & Putz, 1996). While such practices deliver long-term ecological benefits, their short- to medium-term financial impact places pressure on concession cash flows.

These conditions underscore a core business challenge for PBPH, notably financial viability is no longer shaped solely by forest productivity but increasingly depends on managerial capability to manage overhead efficiently, minimize functional duplication, and redesign operational arrangements. Accordingly, approaches such as JOs, shared service mechanisms, and organizational integration have become increasingly relevant as practical managerial responses to sustained cost pressures within natural forest concessions.

Furthermore, on Economic Performance and Cost Structure issues, there are some prominent issues that emerged as follow:

- *Cost of Goods Sold (COGS)* for natural forest harvesting has increased due to labour, fuel, spare part, planning, operations and compliance costs (FAO, 2022; World Bank, 2019).
- Operating costs per cubic meter (m3) in natural forests often outpace plantation harvesting due to selective logging intensity and remote access (FAO, 2022).
- *Profit margins* for many PBPH holders have narrowed Highly, impacting to stagnant profitability in recent years (MoEF, 2021; FAO, 2023).

These conditions create financial pressure that motivates managerial experimentation such as JOs or *cost-sharing* across concessions. Joint operational arrangements—especially among companies under single corporate groups in adjacent concession landscapes are expected to provide a pragmatic approach to improve *cost reduction*, *governance*, and *operational performance* without relinquishing sustainability commitments. This business project positions JOs as a managerial intervention, aiming to produce evidence-based insights that support strategic decision-making in natural forest concession.

1.2 Company Background

PT Z is a forestry holding company that manages two adjacent PBPH—PT X and PT Y—located within the *Kelay–Segah landscape*, Berau Regency, East Kalimantan. Both subsidiaries operate under business permits for natural forest utilization within the *Multi Usaha Kehutanan (MUK) framework*, which allows the integration of timber harvesting with environmental services and sustainability-related activities (MoEF, 2021). *The Kelay–Segah landscape* is recognized as a forest area with high ecological value and active forestry operations, making it subject to stringent regulatory oversight and sustainability requirements (MoEF, 2023). The adjacency of PT X and PT Y results in similar ecological conditions, regulatory obligations, and operational challenges. This shared context

provides a relevant and controlled setting for analysing organizational and operational integration strategies.

Table 1 Location and Size Areas of the Project

Subsidiary	Location	Area (ha)
PT X	Berau Regency	± 44,402
PT Y	Berau Regency	± 43,600

Source: MoEF, 2023; PT Z internal data, 2024).

As the holding company, PT Z is responsible for defining group-level strategic direction, governance principles, and sustainability commitments for its subsidiaries. PT X and PT Y operate as separate legal entities with their own operational teams, budgets, and accountability structures, while remaining subject to strategic coordination and oversight from PT Z at the group level.

This structure reflects a common governance model in Indonesia's forestry sector, where holding companies manage multiple PBPH units that operate independently to comply with *permit-specific* regulatory requirements. While such separation supports regulatory compliance, it may also lead to duplicated organizational functions, parallel cost structures, and fragmented decision-making. PT X and PT Y are comparable in terms of concession scale, operational scope, and business model orientation. Each concession manages an area of average 44,000 hectares and focuses on selective timber harvesting under SFM principles (MoEF, 2023). Both subsidiaries are required to comply with similar obligations related to forest planning, harvesting operations, environmental protection, social programs, and sustainability certification as well as incur substantial fixed and variable costs related to those obligations.

This dilemma becomes more pronounced when multiple concessions under a single holding operate independently. While legal separation can ensure regulatory clarity, it can also result in duplicated roles, parallel operational systems, and overlapping cost centres across subsidiaries. In the case of PT X and PT Y, the similarity of operational contexts raises questions regarding whether certain functions, resources, and business processes could be managed jointly without compromising accountability and governance integrity.

The core issue faced by the holding and the subsidiaries are not merely whether JOs can reduce operational costs, but whether such integration can be managed in a manner that maintain *accountability, decision clarity, and risk control* across subsidiary entities. This organizational challenge forms the empirical foundation for examining JOs as a managerial intervention in this project.

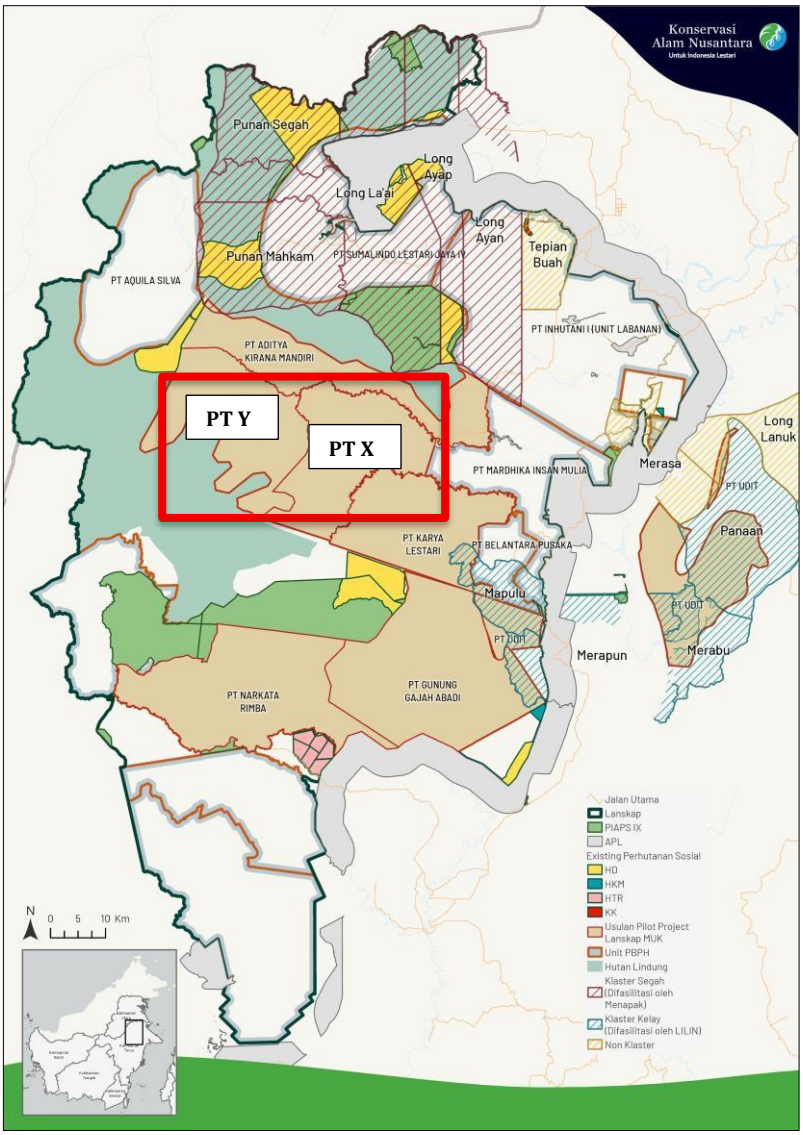

Figure 1 PT. X and PT Y (red box) within broader landscape (YKAN, 2025)

1.3 Problem Background

In the context of Indonesia's upstream natural forestry industry, there are several problems identified as follow:

1. PBPH natural forest concession holders increasingly face a structural mismatch between rising operational costs and constrained revenue streams.
2. The implementation of SFM requirements—such as PHPL[3], FSC certification, RIL, forest protection, and social obligations—has highly increased fixed and

[3] PHPL is abbreviation from Pengelolaan Hutan Produksi Lestari, a mandatory SFM certification in Indonesia

overhead costs that are independent to annual production target volume (FAO, 2022; FSC International, 2023).

3. Timber prices from natural forest harvesting remain volatile and, in many cases, insufficient to fully absorb these additional cost burdens (World Bank, 2019).
4. PT X and PT Y operate independently despite having similar operational characteristics, creating potential duplication in planning, compliance, logistics, administration, and sustainability-related functions.

1.4 Research Question

This project seeks to evaluate Joint Operations (JOs) as a managerial intervention in improving cost reduction and governance within upstream natural forestry concessions. The study addresses the following research questions:

1. How does the implementation of JOs between PT X and PT Y reshape the structure and level of operational and overhead costs compared to *single-entity operations*?
2. Which cost components (*fixed, variable, and overhead*) are most responsive to JO, and through what operational mechanisms do these changes occur?
3. How does the implementation of JOs influence governance arrangements, particularly in terms of *clarity of authority, cost accountability, and decision-making processes* across subsidiaries?
4. What governance risks and managerial challenges emerge from JOs, and how can these risks be mitigated through structured organizational and governance design?

1.5. Research Objectives

Hence, the research objectives determined as follows:

1. To evaluate changes in operational and overhead cost structures resulting from the implementation of JOs between PT X and PT Y.
2. To identify specific cost components and operational mechanisms through which JOs generate efficiency or inefficiency.
3. To assess the impact of JOs on governance arrangements, particularly in relation to accountability, authority, and decision-making structures.
4. To synthesize managerial lessons learned from the design and evaluation of JOs as an organizational intervention in PBPH companies.

1.6. Gap and Novelty

1.6.1. Research Gap

Previous studies on organizational integration, shared services, mergers, and collaborative operating models have predominantly focused on financial performance, operational efficiency, or post-merger organizational outcomes. Similarly, studies within the forestry sector have generally concentrated on sustainable forest management, reduced impact logging (RIL), certification compliance, and operational productivity. For PBPH Natural Forest Concessions, management approach such as *Joint operations (JOs*) have also been implemented by some of business owners, however, limited research has examined *JOs* as a managerial intervention within natural forest concession companies (PBPH), particularly from the combined perspectives of structural cost reduction (cost saving) and governance effectiveness. Existing studies also tend to assess financial and governance dimensions separately, resulting in limited guidance for managerial decision-making regarding organizational integration.

1.6.2. Research Novelty

This study contributes to the literature by proposing an integrated evaluation framework that combines *Functional Overlap Analysis (FOA), Structural Cost Analysis (SCA), Joint Operations Financial Advantage (JOFA), and Governance Effectiveness Index (GEI)* within a single decision-support framework.

To the best of the researcher's knowledge, no previous study has applied these four analytical instruments simultaneously to evaluate Joint Operations in the context of Indonesian natural forest concession companies (PBPH). The study therefore extends both managerial and practical understanding of how organizational integration can be assessed prior to implementation through an ex-ante intervention assessment approach.

The novelty of this study lies in the development of an integrated managerial evaluation framework that simultaneously assesses organizational overlap, structural cost efficiency, financial advantage, and governance effectiveness to support Joint Operations decision-making in natural forest concession companies.

1.7. Limitation

Several limitations should be considered when interpreting the findings of this study, as follow:

1. The study is conducted within two natural forest concession companies (PT X and PT Y) operating under the same holding structure, which may limit the generalizability of the findings to other industries or organizational settings.
2. The study adopts an ex-ante intervention assessment approach. Consequently, the results represent projected outcomes derived from organizational analysis, budget simulations, and stakeholder assessments rather than actual post-implementation performance.
3. Governance effectiveness is partially evaluated using qualitative perceptions obtained from key informants. Although triangulation procedures were applied, subjective assessments may influence the interpretation of governance outcomes.

The study focuses on structural efficiency and governance dimensions and does not assess broader strategic outcomes such as organizational culture, employee engagement, long-term productivity, or market competitiveness following Joint Operations implementation.

CHAPTER 2

PROJECT DESCRIPTION AND EVIDENCE REVIEW

2.1 Action Research as a Theoretical Lens

Action Research (AR) is a well-established research approach designed to study and improve organizational practice *through iterative cycles of diagnosis, action, evaluation, and reflection*. Originally articulated by Kurt Lewin, AR was conceived to bridge the persistent gap between social theory and real-world problem solving, emphasizing that knowledge is most valuable when it is generated through purposeful action within the system being studied (Lewin, 1946). Instead of viewing organizations as merely passive subjects of analysis, AR conceptualizes them as dynamic social systems where learning and change take place concurrently.

Action Research has been widely adopted in situations characterized by complexity, contextual specificity, and managerial intervention, where problems cannot be meaningfully examined through detached or purely positivist research designs (Reason & Bradbury, 2008). Organizational phenomena such as *cost inefficiency, governance fragmentation, and coordination failures*—particularly in multi-unit or multi-entity settings—are embedded in institutional, regulatory, and behavioural contexts that evolve over time. In such environments, causal relationships are not easily isolated, and experimental control is neither feasible nor desirable.

In operations and *process-oriented contexts*, AR is especially appropriate because it enables researchers and practitioners to *co-design* interventions while simultaneously generating actionable knowledge (Coughlan & Coghlan, 2002). This approach recognizes the dual role of the researcher as both *an analyst and a change agent*, that allowing managerial decisions, organizational constraints, and stakeholder considerations to be incorporated directly into the research process. As a result, the validity of AR is derived not from statistical generalization, but from *practical relevance, learning outcomes, and the robustness* of the intervention logic.

This positioning aligns closely with the nature of this project. The implementation of JOs between PT X and PT Y is not to be examined merely as an observed organizational phenomenon, but as a deliberate managerial intervention intended to address rising operational and overhead costs under sustainability-driven forestry management. The

project research seeks to evaluate whether JOs can improve cost reduction and governance effectiveness within the specific institutional context of natural-forest concession's companies, rather than to test a universal theory of organizational integration.

Furthermore, AR is particularly suitable for studies in which the primary objective is managerial learning and decision support. As emphasized by Reason and Bradbury (2008), AR prioritizes "*knowledge-in-action*," enabling organizations to reflect on planned or ongoing changes and refine their strategies accordingly. In the case of PT X and PT Y, the research is designed to inform strategic decisions regarding *organizational design, cost allocation, and governance arrangements* under JOs.

The use of AR also reflects the realities of sustainability-oriented industries such as aimed by PT X and PT Y, where operational decisions are constrained by regulatory requirements, certification standards, and long-term environmental commitment and responsibilities. In such contexts, interventions often cannot be fully implemented or experimentally tested within short research timeframes. Therefore, AR allows for the use of analytical simulation and scenario-based evaluation as legitimate forms of action, provided they are grounded in real organizational data and managerial processes (Coughlan & Coghlan, 2002).

2.2 Operational Cost reduction in Natural Forest Concession Operations

Operational cost reduction refers to an organization's capability to deliver outputs using the minimum level of resources required to meet defined performance and compliance standards. In management and operations literature, cost reduction is commonly assessed through indicators such as *unit cost, cost structure, and cost predictability* rather than absolute cost levels alone (Drury, 2018). This distinction is particularly important in regulated and sustainability-oriented industries, where *higher absolute costs* may be unavoidable, but *inefficient cost structures* can still undermine financial viability.

In practice, efficiency analysis differentiates between *fixed and overhead costs*—including administrative, coordination, and structural expenses—and variable costs, which are directly linked to production activities (Horngren, Datar, & Rajan, 2015). The managerial levers available to improve efficiency differ substantially across these cost categories. While variable costs are largely influenced by biological, technical, and site-specific factors, fixed and overhead costs are more directly shaped by organizational design, coordination mechanisms, and resource allocation decisions.

This distinction is particularly relevant in resource-based operations such as PBPH. Overhead and indirect costs tend to increase as regulatory, sustainability, and coordination demands intensify (Kaplan & Cooper, 1998). In the context of sustainable forestry, additional requirements—including pre-harvest inventories, detailed operational planning, training, certification audits, environmental monitoring, and social engagement—introduce cost elements that are largely independent of annual production volume. Empirical studies have shown that the adoption of RIL and related best management practices can increase short-term operational costs, particularly during the initial implementation phase (Pinard & Putz, 1996). When such costs are not offset by efficiency gains elsewhere in the organization, overall unit costs can increase significantly.

For this reason, cost reduction in natural forest operations must be evaluated not only through total cost levels, but also through cost per cubic meter (or comparable output unit) and changes in the proportion of overhead versus variable costs. JOs are expected to primarily affect cost reduction through reductions in duplicated functions, shared use of resources, and improved coordination, rather than through changes in biological harvesting constraints (Horngren *et al*., 2015; Kaplan & Cooper, 1998). Consequently, the assessment of cost reduction in this project focuses on how JOs arrangements alter the structure and allocation of overhead and operational costs across PT X and PT Y, rather than on production volume optimization alone.

2.3 Governance and Organizational Structure

Corporate governance concerns the structures and processes through which organizations are directed and controlled, including *decision rights, accountability mechanisms, oversight arrangements, and performance monitoring systems* (Tricker, 2019). In organizational design, ineffective governance often reflects in unclear roles, overlapping responsibilities, fragmented authority, and weak accountability, all of which can contribute to operational inefficiencies and inflated overhead costs (Galbraith, 2014).

In multi-unit and multi-entity organizations, governance challenges are amplified by increased coordination complexity. While the separation of legal entities can enhance accountability at the permit or subsidiary level, it can also create duplication of control functions, parallel reporting lines, and misaligned incentives if not supported by clear role definitions and cost accountability mechanisms (OECD, 2015; Galbraith, 2014). These governance challenges are particularly relevant in holding structures managing multiple operating subsidiaries within the same industry and regulatory environment.

From a governance perspective, JOs introduce a *trade-off* between efficiency and control. On one hand, JOs can reduce redundancy, streamline decision-making, and improve resource utilization by consolidating shared functions. On the other hand, if governance arrangements are inadequately designed, JOs may introduce new risks, including blurred authority, weakened accountability, disputes over cost sharing, and reduced transparency in performance evaluation (Tricker, 2019; OECD, 2015). As a result, governance effectiveness cannot be assumed as an automatic outcome of operational integration.

In the context of PT X and PT Y, the implementation of JOs raises critical governance questions related to decision rights, reporting lines, and cost accountability between the holding company and its operating subsidiaries. This project therefore treats governance outcomes—such as *clarity of authority, accountability mechanisms, and organizational control*—as core evaluative dimensions, together with cost reduction, in assessing the overall effectiveness of JOs.

2.4 JO as an Organizational Mechanism

JOs can be conceptualized as an organizational mechanism that enables two or more legally distinct entities to collaborate operationally by sharing resources, coordinating activities, and capturing synergies while maintaining separate legal identities (Gulati, 1998). Unlike mergers or full organizational integration, JOs allow participating entities to retain permit-level accountability and regulatory compliance while selectively integrating functions where coordination and scale efficiencies are expected to be highest. In the case of PT X and PT Y, this *hybrid structure* becomes particularly relevant because legal separation is required under PBPH regulation, yet operational realities (shared access roads, *workforce pool*, certification obligations) create natural interdependencies.

In the context of PBPH, JOs are commonly applied to operational domains characterized by high fixed and overhead costs, including logistics, planning, equipment (*heavy machines)* utilization, certification management, environmental monitoring, and administrative support. JOs therefore serve as an organizational response to structural inefficiencies arising from parallel operations within similar ecological, regulatory, and geographical contexts. There are 3 (three) rationales why JOs are worth to be adopted, namely *transaction cost economics, resources-based view and alliance governance.*

From the perspective of *Transaction Cost Economics (TCE*), JOs can reduce duplicated coordination and contracting costs when activities across entities are highly interdependent

(Williamson, 1985). In forestry operations, interdependencies are evident in shared access roads, overlapping supply chains, common labour markets, and similar compliance requirements. When each concession independently manages these interdependent activities, transaction costs—such as contracting, monitoring, and coordination—tend to increase. JOs can mitigate these costs by internalizing coordination within a shared operational arrangement, if governance mechanisms are sufficiently robust to limit opportunistic behaviour.

The Resource-Based View (RBV) further explains the rationale for JOs by emphasizing the pooling of complementary resources and capabilities to improve efficiency and performance (Barney, 1991). In natural forest management, critical resources—such as skilled forestry planners, certified sustainability personnel, specialized equipment, and institutional knowledge of certification systems—are often scarce and costly to maintain at the individual concession level. JOs allow these resources to be shared across entities, increasing utilization rates and reducing per-unit cost without compromising operational standards. From an RBV perspective, the efficiency gains from JOs stem not from scale alone, but from improved deployment and leverage of existing organizational capabilities.

However, both TCE and RBV perspectives recognize that JOs do not automatically produce efficiency gains. Outcomes depend critically on the design of governance arrangements. *Alliance governance* emphasizes that collaborative outcomes are shaped by how *roles, decision rights, control mechanisms, and incentive structures* are defined and enforced (Das & Teng, 2001). Inadequate governance design can result in *blurred authority*, cost allocation disputes, and weakened accountability—risks that are particularly salient in JOs involving shared assets and joint decision-making.

These governance challenges are amplified in forestry concessions, where legal accountability remains tied to individual permits, while operational integration occurs across entities. Without clear governance structures, JOs may inadvertently dilute responsibility for compliance, cost control, or operational performance. As such, JOs in natural forest management must be supported by explicit mechanisms *governing cost-sharing, decision authority, reporting lines, and dispute resolution*.

Consequently, JOs should be understood not merely as an operational arrangement, but as an organizational design choice that balances efficiency and control. Efficiency gains are most likely to materialize when (i) operational functions genuinely overlap, (ii) cost allocation mechanisms are transparent and accepted by participating entities, and (iii) governance controls effectively prevent ambiguity and opportunism (Williamson, 1985;

Das & Teng, 2001; Gulati, 1998). In the absence of these conditions, JOs may generate coordination costs that offset potential efficiency benefits.

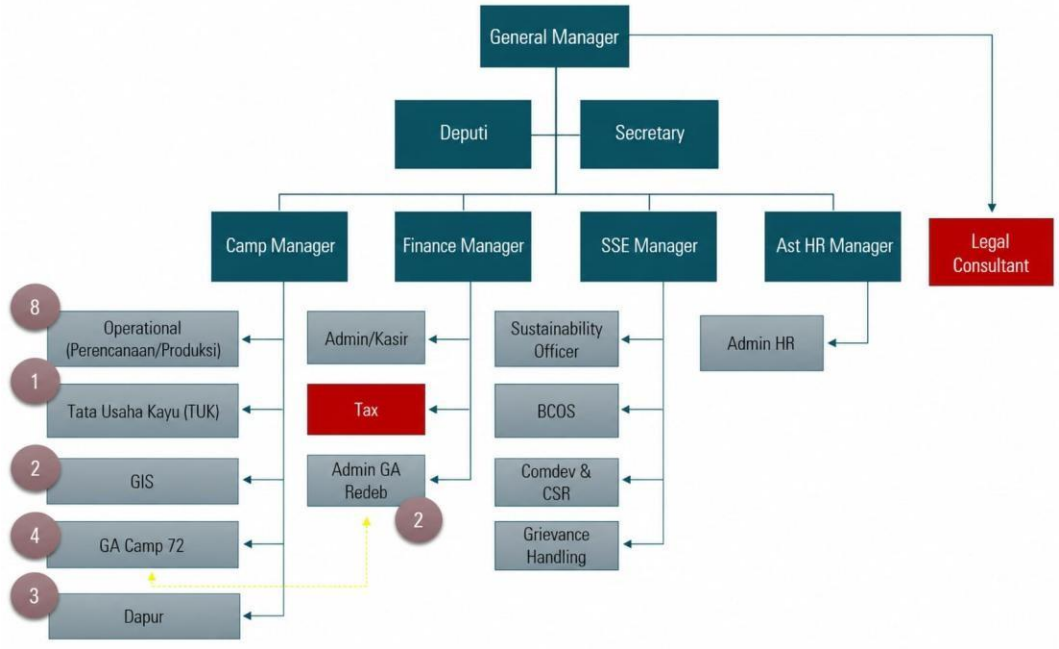

Figure 2 Organization Structure of *JOs* PT X and PT Y (*Internal Data*, 2026)

In this research project, JOs between PT X and PT Y are conceptualized as a deliberate organizational mechanism designed to address rising cost pressures and governance complexity under sustainability-driven forestry management. Instead of presuming that efficiency improvements will automatically result, this project examines JOs as a managerial intervention whose success is contingent upon both financial cost outcomes and governance effectiveness within the institutional framework of PBPH. The organizational structure of JOs can be seen in **Figure 2.**

2.5 Integrated Conceptual Framework

Based on the literature discussed above, this project views JOs as a practical managerial intervention that may improve both structural Cost reduction and governance effectiveness. To translate these concepts into measurable analysis, the study applies four complementary analytical tools.

1. *Functional Overlap Analysis (FOA)* is used to identify areas where functions between entities overlap and to assess the degree of similarity, interdependence, and potential for integration, following established organizational design principles (Galbraith, 2014).

2. *Structural Cost Analysis (SCA)* evaluates how overhead and structural costs are allocated across functions. Using *cost-driver* logic, SCA helps identify duplication of cost components and estimate the potential for structural Cost reduction (Kaplan & Cooper, 1998; Horngren et al., 2015).

3. *JO Financial Analysis (JOFA)* converts the structural changes identified in FOA and SCA into financial terms, to estimate cost savings, efficiency improvements, and changes in unit cost.

4. *Governance Effectiveness Index (GEI)* is applied to assess whether JOs affects governance quality. The GEI assessment is based on expert judgement supported by qualitative evidence and organizational analysis (Galbraith, 2014; OECD, 2015).

These four instruments provide an integrated basis to evaluate whether JO represents a viable managerial solution within the PBPH organizational context.

Table 2 Analytical Instruments Used in Research

No	Analytical Instruments	Purposes	Data Input	Analytical steps
1	FOA	To identify duplicated functions across the companies under single-entity operations. The analysis focuses on functions that are structurally similar, governed by comparable regulations, and capable of being jointly managed without undermining permit-level accountability.	• Organizational structures and job descriptions • Functional responsibility matrices • Management interviews and structured questionnaires	• List core and support functions (e.g., planning, logistics, certification, administration). • Identify whether each function exists independently in both entities. • Assess the degree of overlap and the feasibility of consolidation.
2	SCA	SCA reallocates overhead and structural costs from single-entity operations to a JOs structure using cost-driver logic, enabling comparison of cost structures before and after integration.	• Approved budget 2025 stand alone for each PT • Approved 2026 JOs budget • FOA results and cost-driver questionnaires	• Identify overhead cost pools (e.g., administration, compliance, logistics). • Define cost drivers for each pool (e.g., number of staff, hectares managed, activity intensity). • Allocate costs based on proportional driver usage.

No	Analytical Instruments	Purposes	Data Input	Analytical steps
3	JOFA	To translates organizational and cost-structure changes into financially interpretable outcomes, enabling management to assess whether JOs improve financial feasibility.	• Budget approved PT X and PT Y for FY 2025 under single operations • Approved 2026 JOs budget • Production volume assumptions (if applicable)	• Review SCA budget 2025 under single operations. • Compare the costs with approved 2026 JOs budget. • Estimate cost savings (nominal and percentage) and unit cost changes (if production volume is available). • Assess financial feasibility based on cost reduction and structural efficiency indicators.
4	Governance effectiveness index (GEI)	To evaluates whether the proposed JOs improves managerial control and accountability between PT X and PT Y. The analysis focuses on decision rights clarity, cost accountability transparency, and reporting line simplification to ensure that operational integration strengthens coordination without undermining permit-level responsibility.	• Current organizational structures and reporting lines • Proposed JOs organizational structure. • Management interviews and governance assessment questionnaires. • Cost allocation rules and financial accountability mechanisms. • Internal SOPs related to decision authority and operational coordination	• Map current governance arrangements (authority, reporting, accountability) • Assess governance conditions under single-entity operations using three governance dimensions. • Collect managerial scoring using a 5-point Likert scale • Calculating GEI • Evaluate governance under proposed JOs structure • Triangulate governance findings with FOA and SCA results

Source: Developed by the author based on Galbraith (2014); Kaplan & Cooper (1998); Horngren et al. (2015); OECD (2015); Coghlan & Brannick (2014).

The analysis begins with *FOA*, which identifies duplicated functions across entities and assesses the feasibility of consolidating overlapping roles. The results of FOA inform the second stage, *SCA*, where overhead cost pools are mapped and reallocated using cost-driver logic to simulate a JOs structure. The third stage, *JOFA*, translates structural cost adjustments into financial metrics by comparing cost structure from the 2025 single-entity costs with the proposed 2026 JOs budget to estimate potential cost savings and feasibility. The final step is managerial decision and learning, where efficiency gains and governance implications are evaluated to support strategic choices.

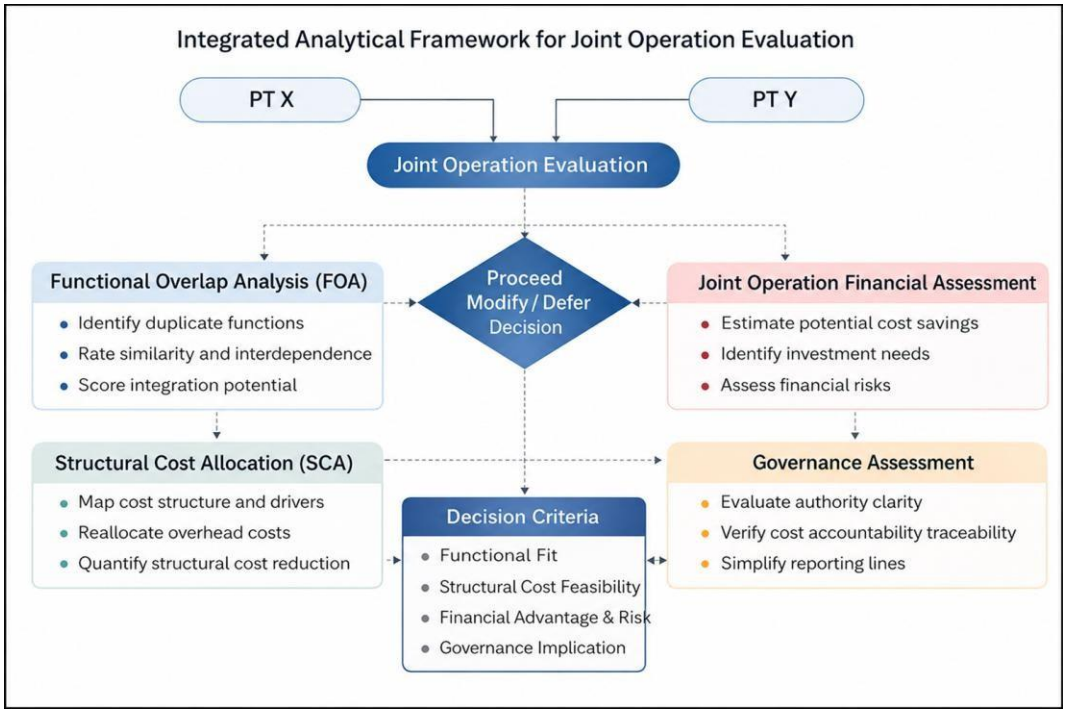

Figure 3 Integrated analytical framework FOA, SCA, JOFA and GEI (source)

(*Source*: developed by author Based on Galbraith (2014); Kaplan & Cooper (1998); Horngren et al. (2015); OECD (2015); Coghlan & Brannick (2014))

Figure 3 shows the analytical logic which is translated into a broader theoretical model that situates JOs within the organizational realities. This framework clarifies *why* such intervention is necessary by positioning both PT X and PT Y within a shared holding structure facing common cost pressure drivers. The model shows the contrasts of the continuation of single-entity operations—characterized by redundant functions and structural inefficiencies—with a deliberately designed JOs mechanism incorporating functional consolidation (FOA), cost reallocation (SCA), financial advantage translation (JOFA), and coordinated governance arrangements.

The theoretical framework illustrates how PT X and PT Y, operating under Holding Company PT Z (**Figure 4**), face common cost pressures in natural forest concession (PBPH) operations, particularly from structural overheads and sustainability-related activities. Under a standalone operating model, these pressures may lead to duplicated functions, resource inefficiencies, and redundant activities.

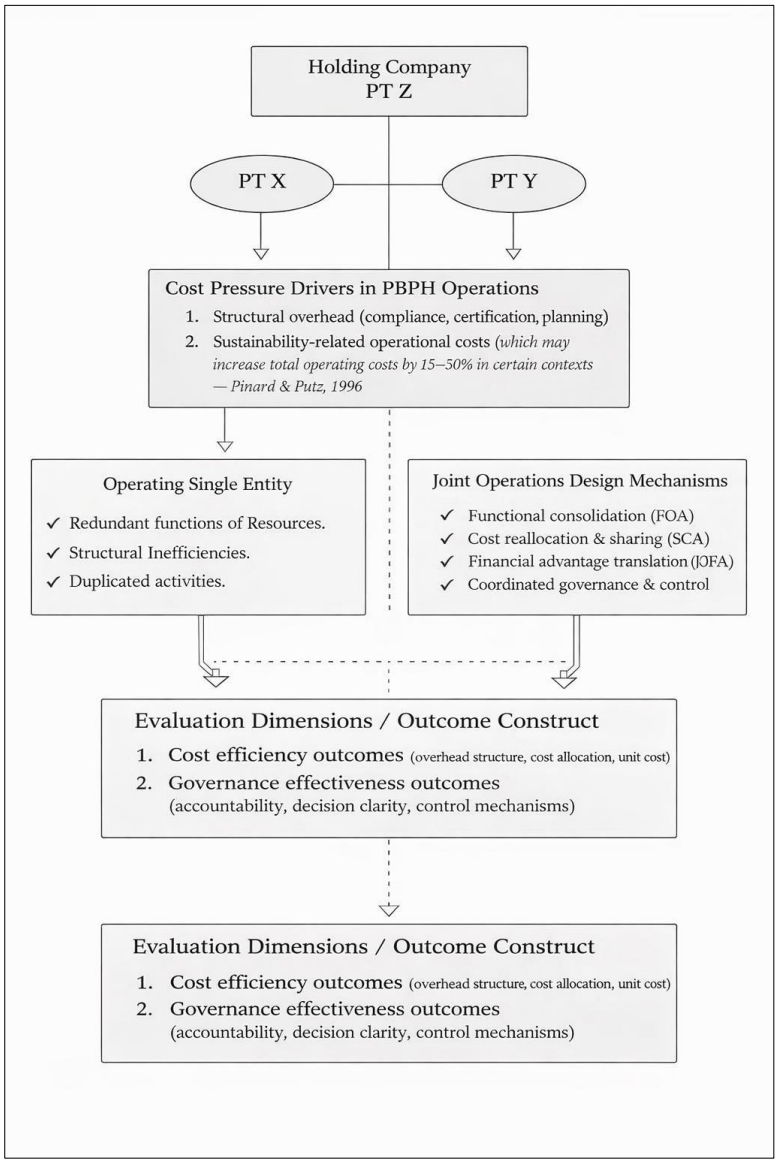

Figure 4 Theoretical research framework

Source: Developed by researcher, based on Pinard and Putz (1996), Galbraith (2014), and Coughlan and Coghlan (2002).

To address these challenges, the study evaluates a Joint Operations (JOs) approach that integrates selected functions, reallocates costs, captures financial synergies, and strengthens governance coordination. The effectiveness of the JOs model is assessed through two key outcome dimensions: cost efficiency (overhead structure, cost allocation, and unit cost performance) and governance effectiveness (accountability, decision clarity, and control mechanisms). This framework provides the basis for examining whether JOs can serve as a viable managerial intervention to improve organizational performance in PBPH operations

CHAPTER 3

METHODOLOGY

3.1 Project Planning: Design of the JOs Intervention

The planning phase focuses on designing *Joint operations* (JOs) as a structured managerial intervention. Two alternative operational configurations are developed notably:

- *Single-entity operations*, reflecting the existing organizational arrangement; and
- *Joint Operations (JOs)*, where selected functions are consolidated under coordinated governance or consolidation and comparison of cost allocation (fixed and variable costs) between single operations versus JOs models.

The intervention design draws on organizational design and cost management principles, which emphasize the importance of aligning structure, processes, and accountability mechanisms (Galbraith, 2014). The types and sources of data used in this project consist of both primary and secondary data, collected to ensure comprehensiveness and validity of the analysis. Primary data obtained directly from internal senior management teams, managers, officers, and relevant parties within PT X and PT Y through *in-depth interviews*, *structured questionnaires for FOA* and SCA, as well as expert judgments related to operational efficiency and JOs.

Table 3 The Type and Sources of Data for Analysis

No	Type of Data	Sources of Data
1	Qualitative	1) Organizational structure, 2) Listing of activities for each work function. 3) Job descriptions, and 4) Information on overlapping functions
2	Quantitative	1) Operating costs. 2) Sustainability costs (FSC, RIL-C, Conservations and Social Activities etc.). 3) Production data, and 4) Financial assumptions
3	Primary	1) Interviews. 2) FOA, SCA and GEI questionnaires
4	Secondary	1) Company approved budget. 2) Sustainability cost literature. 3) Government regulations

Source: Author's compilation based on Saunders et al. (2019) and Creswell (2014).

Data collection includes qualitative interviews with Directors, Managers, and operational personnel to understand current organizational arrangements and coordination challenges. Structured questionnaires are used to support FOA and SCA assessments, particularly in

identifying functional overlaps and shared cost assumptions. Historical financial data (Budget 2025 and 2026) are utilized to establish the baseline cost structure, which is then compared with a scenario-based financial simulation applying the JOFA framework. **Table 4** outlines the types and sources of data required for the study. Data collection conducted through interviews and discussions:

Table 4 Data collection methods for project research

Analysis	Source of Data	Status	Methodology	Description
Quantitative	Approved Budget 2025 for PT X and PT Y	Single Operations	1. Direct data analysis refers to relevant documents. 2. SCA questionnaires	Baseline Planning Data
	Approved Budget 2026 for PT X and PT Y, using JO's scenario	Joint operations (JOs)		Intervention Scenario Data
Qualitative	In-depth interview regarding responsibilities for each position, referring to the job description of the key person and potential overlaps	Joint operations (JOs)	FOA questionnaires and in dept interview to assess functional similarities between units.	Actual data
	Surveying samples of employees to assess the effectiveness of governance implementation	Joint operations (JOs)	Questionnaire distribution	Actual data

Source: Author's compilation based on Creswell (2014); Saunders et al. (2019); Likert (1932); Coghlan & Brannick (2014).

Table 5 List of Respondents for Interview

No	List Respondent	Job Position	Organization
1	Ruslandi	Director	PT X
2	Frilla Elnando	Director	PT Y
3	Delon Marthinus	General Manager	PT Y
3	Khornaylius Ervin	Finance Manager	PT Y
4	Teddy Christianto	Camp Manager	PT X
5	Rocky M Panjaitan	HR Manager	PT X
6	Ilham Yakin	Grievance Handling	PT X
7	Dwi Purwanto	Certification and Compliance	PT X
8	Ananda Mikola	HSE	PT X
9	Heny Dian	Community Development/CSR	PT Y
10	Fitrianto Faiz	GIS Specialist	PT X
11	Purwanto	Head of Planning	PT X
12	Ali Syopyan	Head of Planning	PT Y

Source: Internal Data reprocessed in Excel

3.2. Project Implementation: Analytical Simulation of JOs

Simulation and analytical modelling within action research project are considered acceptable forms of intervention when direct implementation is not yet feasible, if the results provide practical insight for managerial decision-making (Coughlan & Coghlan, 2002; Coghlan & Brannick, 2014). In this project, the implementation stage is carried out

through a combination of qualitative inquiry and budget analysis to evaluate the potential impact of Joint Operations.

Through this approach, the integrated FOA–SCA–JOFA framework is applied in a practical and decision-oriented manner, enabling the study to assess potential efficiency improvements and financial implications of the proposed JOs structure. A summary of scoring approaches, cost allocation logic, and financial indicators used in the analysis is presented in **Table 6**.

Table 6 The Scoring Methods and Formula to Evaluate JOs

<table>
<tr><th>Instrument</th><th>How to analyze</th></tr>
<tr><td>FOA Scoring Logic</td><td>
The formula for FOA:
$$FOA_i = O_i \times (w_1 S_i + w_2 I_i + w_3 P_i)$$
S_i= Similarity score, the level of similarity of activities between work units
I_i= Interdependence score, the level of cross-unit coordination dependency
P_i= Integration Potential score, the level of feasibility of integration both technically and organizationally
O_i= Overlap indicator (i = function index, i = 1,2, 3, n (number of overlapped function)
w1 + w2 + w3 = weight that most relevance for PT X and PT Y

Notes: The weighting scheme was determined based on managerial judgment that the degree of interdependence and integration feasibility exerts a greater influence on the realization of efficiency gains than mere similarity of activities alone.

Interpretation
Higher FOA values indicate greater potential for efficiency gains through JOs, subject to governance safeguards.

FOA Score Interpretation Framework:
<table>
<tr><th>Score Range</th><th>Interpretation</th><th>Descriptive Narrative</th></tr>
<tr><td>1.0 – 2.0</td><td>Low Feasibility</td><td>The activity demonstrates limited operational interdependence and low integration practicality. Although structural similarity may exist, the expected efficiency gains from JOs are minimal. Integration is not recommended unless supported by strong strategic considerations.</td></tr>
<tr><td>2.1 – 3.0</td><td>Medium Feasibility</td><td>The activity shows partial interdependence and medium integration potential. JOs may generate efficiency improvements; however, benefits are likely incremental rather than transformative. A phased or coordination-based approach is recommended.</td></tr>
<tr><td>3.1 – 4.0</td><td>High Feasibility</td><td>The activity exhibits substantial operational interdependence and integration practicality. JOs is likely to generate meaningful efficiency gains through consolidation or shared services. Structural integration is strategically justifiable.</td></tr>
<tr><td>4.1 – 5.0</td><td>Very High Feasibility</td><td>The activity demonstrates strong interdependence and high integration readiness. Consolidation is expected to Highly enhance efficiency, reduce duplication, and improve governance structure. Immediate integration should be prioritized.</td></tr>
</table>
</td></tr>
</table>

Structural Cost Allocation (SCA)	Basic Allocation Formula to be used: For cost pool *j* allocated to function/entity *i*: $$Allocated\ Cost_{ij} = Total\ Cost_j \times \frac{Driver_{ij}}{\sum Driver_j}$$ **Notes:** i = entity index (PT X or PT Y) j = cost pool index (HRGA, Planning, Compliance, etc.) where i denotes function index (i = 1…n), and j denotes cost pool category (j = 1…m).
Cost Structure Indicators:	Total overhead cost Overhead ratio: $$Overhead\ Ratio = \frac{Overhead\ Cost}{Total\ Cost}$$ **Interpretation** A reduction in overhead ratio under JOs indicates structural efficiency gains attributable to shared functions rather than production volume changes.
JO Financial Analysis (JOFA)	Core JOFA Metrics 1. Cost Saving (Nominal): $$Cost\ Saving = Average\ Actual\ Cost_{Single} - Planned\ Cost_{Joint}$$ 2. Cost Saving Percentage: $$Cost\ Saving\ (\%) = \frac{Cost\ Saving}{Average\ Actual\ Cost_{Single}} \times 100$$ 3. Unit Cost Comparison: $$Unit\ Cost = \frac{Total\ Cost}{Production\ Volume}$$ 4. JOFA Index (Composite Indicator – Optional): $$JOFA = w_1(\Delta Total\ Cost) + w_2(\Delta Overhead\ Ratio) + w_3(\Delta Unit\ Cost)$$ where w_1–w_3 are managerial weights reflecting strategic priorities. **Interpretation** Positive JOFA outcomes indicate that JOs improve financial feasibility primarily through overhead rationalization and structural efficiency, rather than through increased production intensity.
Governance Effectiveness Index	To summarize governance conditions, this project constructs a **Governance Effectiveness Index (GEI)** based on the average score of the three governance dimensions. The index is calculated using the following formula: **Per respondent:** $$GEI_r = \frac{CDR_r + CAT_r + RLS_r}{3}$$ **Overall average:** $$\bar{GEI} = \frac{\sum GEI_r}{n}$$

Where:
CDR = Clarity of Decision Rights
CAT = Cost Accountability Transparency
RLS = Reporting Line Simplification

The GEI is calculated for both governance scenarios:

- current governance structure
- proposed JO structure

The difference between these two scores represents the **governance improvement resulting from JO**.

$$\Delta GEI = GEI_{JO} - GEI_{Current}$$

Interpretation of Governance Scores

The governance effectiveness scores are interpreted using the following ranges:

GEI Score	Interpretation
1.0 – 2.0	Weak governance effectiveness
2.1 – 3.0	Medium governance effectiveness
3.1 – 4.0	Strong governance effectiveness
4.1 – 5.0	Very strong governance effectiveness

The governance improvement resulting from JO is interpreted as:

ΔGEI	Interpretation
< 0	Governance effectiveness decreases
0 – 0.5	Marginal improvement
0.6 – 1.0	Medium improvement
> 1.0	High improvement

Keterangan:

- positive delta = governance improves
- zero = no material governance change
- negative delta = governance worsens

Source: Adapted from Galbraith (2014); Thompson (1967); Horngren et al. (2015); Porter (1985); OECD (2008)

3.3. Observation and Evaluation

The observation and evaluation phase represents the assessment stage of the AR cycle following diagnosis, planning, and JOs simulation. At this stage, FOA, SCA, and JOFA results are interpreted against the initial problem formulation to evaluate whether the proposed JOs structure addresses structural inefficiencies from duplicated functions, rising overhead burdens, and fragmented governance across subsidiaries. Evaluation compares the baseline condition (single-entity 2025 cost structure) with the JOs scenario based on 2026 budget assumptions, focusing on structural cost changes, overhead ratio movement, and governance implications from interviews. Consistent with AR principles, evaluation is treated as an evidence-based managerial assessment rather than statistical hypothesis testing (Lewin, 1946; Reason & Bradbury, 2008).

3.4. Reflection and Learning

The reflection and learning phase constitute the final stage of the AR cycle and ensures methodological rigor through critical interpretation of findings. In this phase, the researcher synthesizes analytical results and organizational insights to derive managerial learning. Reflection focuses on three integrative questions:

1. To what extent does the JOs model improve structural cost reduction without compromising permit-level accountability?
2. What governance trade-offs emerge from consolidating selected functions under a shared operational structure?
3. Under what organizational and regulatory conditions is JOs sustainable as a managerial mechanism within PBPH?

This reflective process connects empirical findings with the theoretical lenses introduced in Chapter 2, including organizational design, *Transaction Cost Economics*, and governance theory (Coghlan & Brannick, 2014). The outcome of this phase is not a claim of universal causality, but a set of context-specific managerial insights and design principles that inform decision-making within PT Z and potentially similar PBPH organizations. The conclusions and recommendations presented in subsequent chapters are therefore grounded in iterative learning derived from structured intervention, evaluation, and reflection.

CHAPTER 4

FINDINGS, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents the findings and discussion according to the four research questions stated in Chapter 1. The analysis integrates evidence generated from *Functional Overlap Analysis (FOA), Structural Cost Analysis (SCA), Joint Operations Financial Analysis (JOFA), and Governance Effectiveness Index (GEI)* to evaluate Joint Operations (JOs) as a managerial intervention within PT X and PT Y.

The chapter synthesizes the results according to the managerial questions being analysed. This approach ensures that the findings directly address the research objectives and provide a coherent basis for managerial decision-making regarding the implementation of JOs in PBPH natural forest concessions, within PT X and PT Y.

4.2 Structural Cost Implications of Joint Operations

4.2.1 Standardization of Cost Structure

To ensure comparability across entities and analytical scenarios, all cost components were standardized into 3 (three) primary cost categories commonly used in managerial cost analysis notably: 1). *Direct Production Cost* (*Biaya Langsung* – L), 2). *Indirect Operational Cost* (*Biaya Tidak Langsung* – TL) and 3). *Overhead Cost* (*Biaya Overhead* – OH). Direct Production Cost represents costs directly attributable to timber production and field operations, including planning activities, operational preparation, and production support activities that vary with operational scale. While Indirect Operational Cost includes supporting operational expenditures necessary to enable production activities but not directly tied to specific output units, such as road maintenance, camp operations, and supporting technical activities. Furthermore, the Overhead Cost represents organizational and administrative expenditures related to governance, management, finance, human resources, and coordination functions required to operate the concession.

Compliance and sustainability related activities, including FSC preparation, High Conservation Value (HCV) management and monitoring, stakeholder engagement, and environmental monitoring, are distributed within Direct Cost, Indirect Cost, and Overhead Cost depending on the nature of the activity. This approach taken as sustainability functions are embedded within operational structures rather than treated as separate cost categories.

Capital expenditure (CAPEX), such as heavy equipment purchases, was excluded from Structural Cost Analysis to avoid distortion of operational efficiency indicators. CAPEX reflects investment decisions related to capacity expansion rather than structural cost reduction and therefore is analysed separately from operational structural cost. This standardization ensures that the comparison between standalone and integrated structures (JOs) reflects genuine efficiency improvement attributable to organizational design rather than differences in investment timing or classification treatment.

Table 7 presents structural cost components that demonstrate potential for cost reduction under the JOs scenario. These cost items are primarily associated with core production activities and essential technical functions that must be maintained regardless of organizational structure. Most of these costs fall under direct cost (L) and certain indirect cost (TL) categories that are directly linked to harvesting operations, field readiness, and compliance requirements.

Table 7 Structural Cost Component Reduction Mapping under JOs

No	Cost Item	Category (L/TL/OH)	Cost Reduction Potential	Efficiency Driver
1	Preparation of RKUPH / RKTPH Documents	L	Medium reduction	Shared planning team
2	Forest Inventory (IHMB)	L	Medium reduction	Coordinated technical planning
3	Topographic Survey	TL	Medium reduction	Integrated survey team
4	Road Alignment Survey	TL	Medium reduction	Shared technical resources
5	Road Network Planning	TL	Medium reduction	Joint infrastructure planning
6	Log pond Planning	TL	Medium reduction	Integrated logistics planning
7	Road maintenance planning	TL	Medium reduction	Shared infrastructure management
8	Camp Site Survey	TL	Medium reduction	Shared camp facilities
9	Silviculture Site Survey	TL	Medium reduction	Reduced duplicated supervision
10	Environmental Documentation Prep.	TL	Medium reduction	Shared compliance preparation
11	Forestry Licensing and Permit Management	TL	Medium reduction	Centralized licensing coordination
12	Survey Equipment Procurement	TL	Medium reduction	Shared technical equipment
13	GPS Procurement	TL	Medium reduction	Shared asset utilization
14	Procurement of Field Communication Equip.	TL	Medium reduction	Shared communication infrastructure
15	Forest Area Security and Protection	TL	Medium reduction	Integrated security system
16	Forest Patrol	TL	Medium reduction	Shared patrol team
17	Patrol Equipment Procurement	TL	Medium reduction	Shared equipment procurement

No	Cost Item	Category (L/TL/OH)	Cost Reduction Potential	Efficiency Driver
18	Environmental Monitoring	TL	Medium reduction	Integrated monitoring system
19	Biodiversity Monitoring	TL	Medium reduction	Shared ecological team
20	HCV Assessment	TL	Medium reduction	Joint HCV assessment
21	HCV Reporting	TL	Medium reduction	Integrated reporting
22	FSC Documentation Preparation	TL	High reduction	Single certification framework
23	FSC Gaps assessment	TL	High reduction	Unified certification preparation
24	FSC Certification	TL	High reduction	Centralized certification process
25	HRGA Salaries and Benefits	OH	High reduction	Elimination of duplicated roles
26	Recruitment cost	OH	High reduction	Centralized hiring process
27	Administration Training	OH	Medium reduction	Shared capacity dev.
28	Stationery	OH	Medium reduction	Shared office supply
29	Laptop Purchasing	OH	Medium reduction	Shared IT infrastructure
30	Software procurement	OH	Medium reduction	Unified software license
31	Senior Management Travel	OH	Medium reduction	Integrated management coordination
32	Management consultant	OH	High reduction	Reduced duplication of advisory roles
33	Financial audit	OH	High reduction	Single audit engagement
34	Tax consultation	OH	High reduction	Centralized tax advisory
35	Accounting system	OH	High reduction	Unified accounting platform
36	SOP Development	OH	High reduction	Single governance framework
37	Corporate legal cost	OH	High reduction	Centralized legal management
38	CSR implementation	OH	Medium reduction	Integrated community programs
39	Community engagement	OH	Medium reduction	Joint stakeholder engagement
40	Conflict resolution	OH	Medium reduction	Centralized grievance handling
41	FPIC gates	OH	Medium reduction	Unified FPIC framework
42	Grievance handling	OH	Medium reduction	Centralized grievance system
43	IT Corporate cost	OH	High reduction	Shared digital infrastructure
44	Database/Storage fees	OH	Medium reduction	Integrated data management
45	Server acquisition	OH	Medium reduction	Shared IT hardware
46	Monitoring system development	TL	Medium reduction	Shared monitoring platform

Source: Internal Data reprocessed in Excel

Activities such as preparation of *production road, operational preparation, field technical equipment, technical workforce, trees-inventory surveys, and harvest planning* represent fundamental components of timber production processes. These cost elements are largely volume-driven and operationally necessary, meaning their magnitude is influenced more by production targets and field conditions than by organizational design structure. Similarly, infrastructure-related costs such as log pond facilities and routine operational supervision are required to ensure continuity of harvesting activities and regulatory compliance. The limited reduction potential in direct cost components indicates that SCA shows only marginal efficiency improvement in this category. This is consistent with the logic that JOs primarily enhances efficiency through rationalization of duplicated support functions rather than reducing core production costs, which tend to remain relatively stable due to their operational necessity.

Table 8 Structural Cost Components with Limited Reduction Potential

No	Cost Item	Category	Expected Impact	Explanation
1	Production Road Development	TL	Stable	Directly tied to harvest volume
2	Production Preparation Activities	L	Stable	Required for field readiness
3	Field Technical Equipment	L	Stable	Needed regardless of structure
4	Field Technical Workforce	L	Stable	Essential operational workforce
5	Forest Stand Assessment Survey	L	Stable	Necessary for harvest planning
6	Harvest Planning	L	Stable	Core production requirement
7	Log pond Infrastructure Development	L	Stable	Tied to production volume
8	Production Technical Costs	L	Stable	Core operational cost
9	Field Operations Supervision	TL	Stable	Required for operational control
10	Routine Compliance and Monitoring Activities	TL	Stable	Necessary compliance activity

Source: Internal Data reprocessed in Excel

4.2.2 Structural Cost Analysis (SCA) Findings

Structural Cost Analysis (SCA) translates organizational overlap into cost structure implications by comparing the estimated structural costs under two scenarios as stated earlier, notably 1). *Standalone scenario,* where each entity maintains its own organizational structure and support functions and 2). *Joint Operations (JOs) scenario*, where overlapping functions are rationalized and shared across entities. The SCA focuses on structural cost components that are relevant to organizational design efficiency, including *direct structural*

costs, indirect operational costs, and overhead costs. Cost components related to purely technical production processes are treated conservatively, recognizing that such costs are often influenced by field conditions and operational constraints rather than organizational duplication.

Prior to performing the detailed SCA, an initial diagnostic comparison was conducted to understand how the composition of structural cost drivers changes between the standalone scenario (2025 baseline) and the JOs intervention scenario (2026). The analysis focuses on the proportional distribution of key cost drivers, namely *Planning, Production, Sustainability Compliance (including HRGA-related governance functions), and Finance and Accounting*, across both entities. By examining the percentage composition of each cost component, the analysis aims to identify structural patterns of cost concentration and to detect areas where duplication of support functions may exist.

Figure 5 shows comparison that production cost remains the dominant cost driver under both scenarios, accounting for approximately 69–70% of total structural cost in the baseline scenario and slightly increasing to approximately 72–74% under the JOs scenario. This increase in proportional share does not indicate rising production cost in absolute terms but rather reflects the relative reduction of non-core structural costs due to organizational integration. In contrast, cost components related to planning, HRGA, sustainability compliance, and finance functions show a decreasing proportional share under the JOs scenario. These functions are typically categorized as indirect and overhead cost components, which are more sensitive to organizational restructuring and consolidation.

The observed shift in cost composition provides an early indication that JOs primarily improves efficiency through rationalization of support and governance functions rather than through high changes in core operational cost drivers. Because technical production activities remain largely volume-dependent, their cost proportion tends to remain stable even when organizational integration is implemented. Meanwhile, reductions in administrative duplication and improved coordination efficiency lead to a smaller relative share of overhead and indirect cost components in the post-intervention scenario.

It confirms that JOs is expected to improve structural cost reduction by reducing duplication in support functions, consistent with the view that organizational integration enhances efficiency through simplified managerial structures and consolidation of shared services.

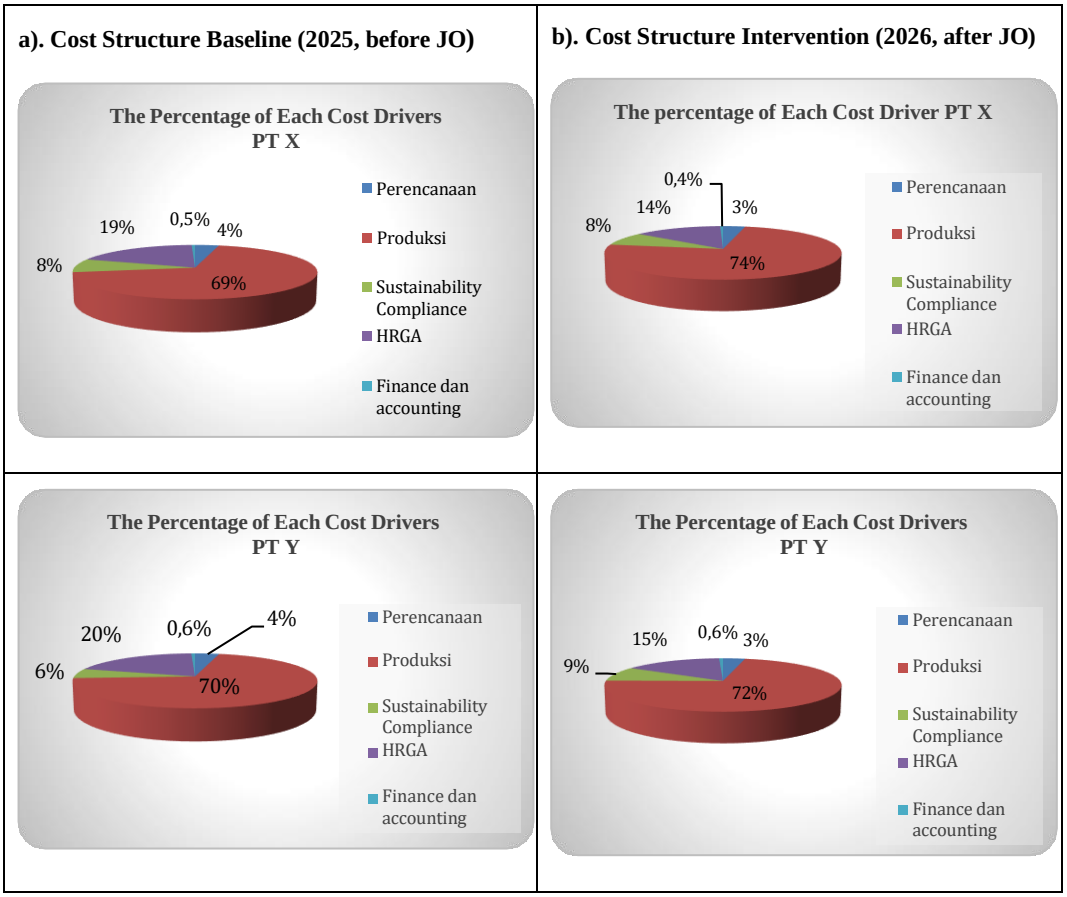

Figure 5 Comparison of cost structure under 2 scenarios (a. Before JOs and b. After JOs)

The results mentioned in the appendix 4 show that the total in-scope structural cost under the standalone scenario amounts to approximately IDR 58.03 billion, while under the JOs scenario the structural cost decreases to approximately IDR 50.61 billion. This represents a total potential structural saving of approximately IDR 7.43 billion, equivalent to 12.8% cost reduction relative to the standalone baseline. These findings indicate that the primary economic benefit of JOs lies in the rationalization of support structures, rather than in substantial reductions of core production costs. Direct production costs remain relatively stable because they are largely determined by operational realities such as terrain conditions, heavy equipment requirements, fuel consumption, contractor rates, and production volumes.

Table 9 Cost Saving/Reduction Contributed from the Integration (JOs)

Category	Standalone	JOs 2026	Saving	Saving %
Direct Cost	37.225.594.561	36.479.400.786	746.193.775	2%
Indirect Cost	16.364.054.040	11.518.005.859	4.846.048.181	30%
Overhead	4.444.780.000	2.612.010.267	1.832.769.733	41%

Source: Internal Data reprocessed in Excel

The substantial reduction in indirect and overhead costs as shown in the **Table 10**, reflects the streamlining overlapping managerial responsibilities and integrating support services such as procurement, compliance administration, and planning coordination. These improvements are consistent with the theoretical expectation structural integration may lower coordination burden and administrative friction, consistent with transaction cost theory (Williamson, 1985; Galbraith, 2014).

The results of SCA therefore confirm that the proposed JOs structure can generate meaningful structural efficiency without requiring significant changes in core operational processes. This is particularly relevant in the context of PBPH, where operational cost structures are inherently constrained by environmental conditions and regulatory requirements. Based on the findings, it strengthens the managerial perspective that JOs should be viewed as a structural efficiency strategy, focusing on simplification of organizational layers, reduction of duplicated support functions, and improvement of coordination effectiveness.

Table 10 Cost Ratios Comparison Between *Single Operation* and *Joint Operation*

Indicator	Standalone	JO 2026
Overhead ratio	8%	5%
Direct cost ratio	64%	72%
Indirect cost ratio	28%	23%

Source: Internal Data reprocessed in Excel

The comparison between the standalone and JOs scenarios indicates that the primary impact of JOs occurs within the organizational cost structure rather than within core production activities. Under the standalone structure, total in-scope structural cost amounted to IDR 58.03 billion. Under the JOs scenario, structural cost declined to IDR 50.61 billion, resulting in estimated savings of IDR 7.43 billion or approximately 12.8%.

The most significant change is observed in overhead and indirect cost components. The overhead ratio decreases from 8% under the standalone structure to 5% under JOs, while indirect cost ratio decreases from 28% to 23%. In contrast, direct production costs remain relatively stable because these costs are driven primarily by harvesting volume, field conditions, regulatory requirements, and operational necessities.

The findings suggest that JOs does not fundamentally alter the economics of timber production itself. Rather, JOs improves structural efficiency through the consolidation of

duplicated support functions and more effective utilization of shared organizational resources.

The implementation of JOs, therefore assumed to reshapes the cost structure by reducing duplicated support and governance functions, lowering overhead and indirect costs while maintaining operational capability at the permit level. The resulting structural cost reduction of 12.8% demonstrates that JOs can improve organizational efficiency without materially affecting core production activities

4.3 Functional Integration and Sources of Cost Efficiency

4.3.1 Functional Overlap Analysis (FOA) Findings

The purpose of FOA is to provide an analytical basis for evaluating whether a JOs arrangement can improve organizational efficiency through functional integration, shared services, and reduction of duplicated roles. The FOA instrument measures three primary dimensions of organizational relationship: *(1) similarity of activities, (2) interdependence of operational processes, and (3) integration potential*. Each activity was evaluated using a *Likert scale* ranging from 1 (very low overlap) to 5 (very high overlap), to enable systematic comparison across functional areas. The analysis covers both core operational functions and supporting organizational activities. The FOA results are summarized in Appendix 1, which presents the average scores of three FOA dimensions as stated above.

The data analysis results indicate that the overall FOA Index reached an average value of approximately 3.73, suggesting a *medium-to-high degree* of functional overlap across the assessed organizational activities. This finding indicates that a substantial proportion of functions share similarities in objectives, processes, or required resources, thereby providing a structural basis for integration under a JOs scheme. Further classification of activities based on their FOA scores reveals a differentiated pattern of integration potential. Out of the total assessed activities:

- 21 activities fall under the category of *High overlap*
- 39 activities fall under the category of *medium overlap*
- 3 activities fall under the category of *low overlap*

The distribution of scores suggests that while full consolidation of all functions may not be appropriate, selective integration of highly overlapping functions is both feasible and strategically justified. Activities with high overlap typically relate to *planning, administrative coordination, compliance documentation, procurement support, and managerial supervision*. These activities are characterized by standardized procedures and

similar resource requirements across entities, making them suitable candidates for shared service arrangements.

Table 11 Summary of Function Overlap Analysis (FOA)

FOA Dimension	Average Score	Interpretation	Implication for JOs
Similarity	4.63	Very high similarity of activities between PT X and PT Y	activities performed using comparable procedures and competencies
Interdependence	2.41	Medium functional interdependence	coordination required but manageable under shared structure
Integration Potential	4.08	high potential for integration	strong feasibility for shared services and centralized coordination
FOA Index	**3.73**	**high overlap**	**JOs structurally feasible**

Source: Author's analysis based on FOA questionnaire results, adapted from Galbraith (2014).

Conversely, activities with low overlap are generally associated with specialized technical or *compliance-related* tasks that require entity-specific knowledge, operational independence, or regulatory differentiation. Maintaining separation in these functions may be necessary to preserve operational effectiveness and ensure regulatory compliance.

From an organizational design perspective, this FOA results suggest that the optimal structure for JOs is not full structural merger but rather selective functional integration, whereby overlapping support functions are consolidated while specialized operational roles remain differentiated. This approach aligns with organizational design theory, which emphasizes the importance of balancing efficiency gains from integration with the need to preserve functional specialization (Galbraith, 2014).

4.3.2 Interpretation of FOA Score

Based on the FOA analysis, it's identified that most activities show FOA Index values between 3.0 and 4.5, indicating strong integration potential. The scoring interpretation applied in this project is shown in the **Table 12.** Using this classification logic, FOA results show that most activities fall into high overlap category, indicating strong structural similarity between PT X and PT Y organizational functions.

Table 12 Distribution of FOA Results by Overlap Category

Overlap Category	FOA Index Range	Interpretation	Number of Activities	% of Total Activities	Interpretation
High overlap	> 3.50	High overlap	52	83%	strong candidate for JO integration
Medium overlap	3.00 – 3.50	Medium overlap	9	14%	integration possible with adjustment

Low overlap	< 3.00	Low overlap	2	3%	requires further assessment
Total			**63**	**100%**	

Source: Internal Data reprocessed in Excel

4.3.3 Activities with *High Overlap*

Activities categorized as High overlap generally have FOA Index above 3.5, indicating that the activity is: 1). Performed using similar procedures, 2). Requires comparable competencies and 3). Can be coordinated efficiently under shared structure. Examples include a). Production planning activities such as forest inventory (ITSP), Working area determination (PAK), Road production preparation (PPWH), and Road's construction (PWH), b). Core timber production activities including felling, skidding, hauling, c). Certification preparation activities (PHPL/FSC), HCV monitoring and biodiversity management, and d). Grievance mechanism and stakeholder engagement, HR, GA, and organizational development functions.

These activities show high similarity scores (generally above 4.5), indicating that both PT X and PT Y perform these functions using similar technical and administrative procedures. High integration potential scores indicate that these activities can be executed jointly without highly increasing coordination complexity. For instance, the activities F09–F14[4] (core harvesting processes) show FOA Index of 4.33, indicating very high structural compatibility. Similarly, sustainability-related functions such as HCV management (F41–F43) also show FOA Index of 4.33, indicating that environmental governance activities can be centralized efficiently. These results suggest that integration of both operational and sustainability functions can be implemented without disruption to operational performance.

4.3.4 Activities with Medium Overlap

Some activities show FOA Index between 3.0 and 3.5, indicating medium overlap. These activities generally: 1). require site-specific adjustment, 2). contain partial differences in implementation procedure and 3). It may depend on local operational context. Some of activities are notably HSE (*Health, Safety and Environment*) inspection activities, environmental monitoring & reporting, social impact monitoring and administrative reporting processes. Although these activities show slightly lower interdependence scores, they still demonstrate integration potential. Lower interdependence scores often indicate

[4] Code F41-F43 are referring to the list activities from the business activities and mentioned in the appendix 1.

that these activities are executed locally but can still benefit from standardized governance framework.

4.3.5 Average FOA Index Across All Activities

The majority of FOA Index values fall between 3.3 and 4.3, indicating consistently high overlap across operational and support activities. The overall average FOA Index across all activities is approximately 3.70 – 3.90. This indicates strong *structural compatibility* between PT X and PT Y. From organizational design perspective, this level of overlap indicates: 1). high potential for shared services; 2). high potential for centralized governance functions and 3). low structural barrier to integration (JOs).

Table 13 FOA Result by Functional Group

Functional Area	Average FOA Index	Overlap Level	Implication
Production planning	3.75 – 4.33	High	shared planning team feasible
Harvesting operations	4.33	High	high operational compatibility
Certification & compliance	3.17 – 4.00	High	centralized sustainability management feasible
HCV & biodiversity	4.33	High	integrated environmental governance feasible
Social & stakeholder engagement	3.22 – 3.78	Medium–high	shared stakeholder engagement possible
HR & General Affairs	3.67	High	strong candidate for shared services
HSE (K3)	3.00 – 3.50	Medium	requires coordination adjustment
Environmental infrastructure	2.67	low–Medium	requires case-specific implementation

Source: Internal Data reprocessed in Excel

4.3.6. Link between FOA and SCA

The results of FOA indicate that the highest degree of functional similarity and integration potential occurs primarily within organizational support and governance-related functions. The highest overlaps were identified in the following functional areas: *Human Resources and General Affairs (HRGA), Finance and Accounting, Planning and Reporting, Sustainability Compliance Management and Stakeholder Engagement.* These functional areas are characterized by standardized procedures, recurring administrative processes, and similar competency requirements across organizational entities. As reflected in the FOA results, these activities demonstrate relatively high similarity, strong interdependence, and substantial integration potential, resulting in an overall FOA Index average of approximately 3.73, which indicates a *Medium-to-high* level of functional overlap.

When interpreted alongside the SCA, the pattern of functional overlap provides a clear structural explanation for the distribution of cost reduction improvements observed under

the JOs scenario. The functions identified above correspond predominantly to cost components classified as Indirect Cost (TL) and Overhead Cost (OH) in the SCA framework. These cost categories typically include *administrative support, coordination activities, reporting processes, compliance management, and corporate governance functions*, which are often duplicated when separate organizational entities maintain parallel structures.

The SCA results demonstrate that the largest efficiency gains from the JOs scenario occur precisely within these cost categories, with estimated reductions of approximately 29.6% in indirect costs and 41.2% in overhead costs, compared to only marginal reduction in direct production costs (approximately 2.0%). This pattern confirms that the primary source of inefficiency in the standalone structure arises not from technical production activities, but rather from duplicated organizational arrangements that support operational activities.

The consistency between FOA and SCA results strengthens the internal validity of the analysis. FOA identifies the presence of overlapping functions from an organizational perspective, while SCA quantifies the financial implications of maintaining separate structures for those functions. The convergence of findings from both analytical instruments suggests that the observed cost reduction potential is not driven by arbitrary financial assumptions but rather reflects underlying structural characteristics of the organization.

Furthermore, the concentration of overlap within *governance-related functions* such as *planning, compliance, reporting, and stakeholder coordination* indicates that JOs can improve not only cost reduction but also organizational alignment and *decision-making coherence*. Integration of these functions can reduce coordination complexity, improve information flow, and strengthen consistency in policy implementation across entities. The results confirm that functional overlap constitutes a structural driver of cost duplication, and that rationalization of overlapping support functions represents a logical and evidence-based pathway for improving organizational efficiency.

Table 14 The FOA and SCA Cost Duplication Mapping

Functional Area	FOA Overlap Level	Type of Duplication Identified	Cost Category (SCA)	Expected JO Treatment	Expected Cost Impact
Strategic planning	High	Parallel planning processes	Indirect cost	integrated planning unit	medium reduction
Annual workplan preparation	High	duplicated technical preparation team	Indirect cost	shared technical team	medium reduction

GIS and mapping support	Medium	duplicated spatial analysis capacity	Indirect cost	shared specialist role	low reduction
Functional Area	**FOA Overlap Level**	**Type of Duplication Identified**	**Cost Category (SCA)**	**Expected JO Treatment**	**Expected Cost Impact**
Compliance documentation	High	parallel reporting structure	Overhead	shared compliance system	high reduction
Certification preparation (FSC/PHPL)	High	duplicated audit preparation resources	Overhead	centralized certification coordination	high reduction
Procurement administration	High	separate procurement process	Overhead	centralized procurement function	high reduction
HR administration	Medium	duplicated HR support activities	Overhead	shared HR services	medium reduction
Finance and accounting support	Medium	parallel bookkeeping and reporting	Overhead	shared finance support	medium reduction
Stakeholder engagement coordination	Medium	duplicated coordination processes	Indirect cost	integrated communication coordination	low reduction
Biodiversity monitoring support	Low	site-specific ecological requirements	Direct cost	remain separated	minimal reduction
Operational supervision	Medium	overlapping supervision roles	Direct cost	selective integration	low reduction
Training coordination	High	duplicated training administration	Indirect cost	shared training system	medium reduction
Data management and reporting	High	parallel reporting database	Overhead	integrated data system	high reduction
Contract management support	Medium	duplicated contract administration	Overhead	centralized contract registry	medium reduction
Logistics coordination	Medium	duplicated logistics planning	Indirect cost	shared coordination platform	medium reduction

Source: Internal Data reprocessed in Excel

The FOA and SCA analyses indicate that efficiency gains are concentrated within functions exhibiting high levels of duplication and integration potential. The overall FOA Index of 3.73 demonstrates substantial functional overlap between PT X and PT Y, particularly in planning, compliance, certification, administration, procurement, finance support, HRGA, and sustainability coordination.

The largest cost reductions occur within indirect and overhead cost categories. Indirect costs decrease by approximately 30%, while overhead costs decrease by approximately 41%. Key contributors include FSC certification management, compliance administration, HRGA support, procurement administration, accounting systems, legal support, and information technology infrastructure.

Conversely, direct production activities such as harvesting operations, forest inventory, field supervision, technical workforce, and production road development show limited reduction potential. These activities remain largely volume-dependent and operationally necessary regardless of organizational structure.

The primary mechanisms generating efficiency improvements include shared services, centralized administration, integrated planning processes, consolidated reporting systems, unified certification management, and shared use of technical and administrative resources.

The cost components most responsive to JO are indirect and overhead functions where duplication exists. Efficiency improvements occur through consolidation of support services, shared resource utilization, centralized governance activities, and reduction of parallel organizational structures.

4.4 Governance Effectiveness under Joint Operations

Governance effectiveness was evaluated through the *Governance Effectiveness Index* (GEI), which examined three dimensions: clarity of decision rights, cost accountability transparency, and reporting-line simplification. The assessment indicates that JOs has the potential to improve governance effectiveness through more structured coordination arrangements and reduced organizational duplication. Decision authority is currently understood at the permit level; however, ambiguity remains when shared resources or cross-entity activities are involved. Similarly, financial accountability exists but is weakened by inconsistent allocation of indirect costs across entities.

4.4.1 Governance Effectiveness Index (GEI)

Governance effectiveness was assessed to understand how the proposed Joint Operations (JOs) structure may influence managerial clarity, accountability, and coordination across PT X and PT Y. The results show that clarity of decision rights obtained an average score of 3.50, indicating that authority structures are generally defined at the entity level, particularly for budgeting and operational planning. However, interview responses indicates that *ambiguity still occurs in cross-entity decisions*, especially in relation to the use of shared resources such as heavy equipment, sustainability programs, and certain planning functions. In practice, coordination between PT X, PT Y, and the holding entity PT Z often relies on informal communication or *case-by-case alignment.* This condition indicates that although basic decision authority is relatively clear, overlapping operational responsibilities may still create coordination inefficiencies when activities require joint execution.

Table 15 The Governance effectiveness Index

Dimension	Score (1–5)	Evidence / explanation
Clarity of decision rights	3,5	Authority is mostly defined at entity level, but ambiguity remains in cross-entity decisions involving shared resources.
Cost accountability transparency	3,75	Core costs are traceable, but shared and indirect costs lack clearly defined allocation drivers.
Reporting line simplification	2,87	Functions remain duplicated across entities, creating dual reporting lines and weak coordination.

Source: Internal Data reprocessed in Excel

For cost accountability transparency, the average score of 3.75 indicates that financial information is generally traceable within each entity, particularly for direct operational costs. Historical financial records show that most production-related expenditures can be clearly identified and monitored. However, transparency becomes *less consistent* for shared or indirect costs, such as administration, logistics coordination, and sustainability-related activities. Interview responses suggest that allocation practices between entities are not always supported by clearly defined cost drivers, which may reduce comparability and limit management's ability to evaluate Cost reduction across units. While this condition does not prevent financial control, it indicates an opportunity to improve cost allocation consistency under a more integrated structure.

The lowest score is observed in reporting line simplification, with an average value of 2.87, suggesting that the current structure still reflects fragmented coordination patterns. Similar functional roles exist in both PT X and PT Y, and interaction across entities often requires multiple layers of communication. Several respondents noted that operational staff frequently need to coordinate across parallel reporting lines when dealing with shared activities such as planning, certification compliance, and sustainability monitoring. The absence of a shared service structure results in duplicated roles and limits the potential for streamlined decision-making processes. This dimension therefore represents the main governance challenge identified in the current organizational arrangement.

Overall, the *Governance Effectiveness Index (GEI)* results indicate that governance structures across PT X and PT Y are functional but not yet fully optimized for integrated operations. Decision authority is generally understood, and financial accountability mechanisms are in place, but coordination complexity remains relatively high due to duplicated functions and parallel reporting structures. These findings are consistent with the FOA results, which indicate a high degree of functional overlap between entities, particularly in support functions and compliance-related activities.

From an Action Research perspective, the GEI findings provide supporting evidence that JOs has the potential to improve governance effectiveness primarily through simplification of reporting relationships, clarification of decision rights for shared activities, and more consistent allocation of shared costs. Integration of overlapping functions into coordinated structures may reduce ambiguity in responsibility boundaries and improve managerial oversight across entities.

However, the results also suggest that structural integration alone may not automatically resolve all governance challenges. Clear definition of authority boundaries, standardized cost allocation principles, and formal coordination mechanisms will remain necessary to ensure that integration leads to improved accountability rather than increased organizational complexity. Therefore, the implementation of JOs should be accompanied by clear governance design principles, particularly regarding decision rights for shared resources, responsibility for indirect costs, and reporting relationships across operational and sustainability functions.

The proposed JOs structure offers opportunities to improve reporting clarity, simplify coordination mechanisms, and strengthen accountability for shared activities while preserving legal accountability at the permit level. As conclusion, JOs improves governance effectiveness by creating clearer reporting relationships, strengthening accountability for shared resources, reducing duplicated decision-making processes, and improving coordination across entities without compromising permit-level responsibility.

4.5 Governance Risks and Mitigation Strategies

4.5.1. JO Financial Analysis (JOFA) Interpretation

JOs Financial Analysis (JOFA) synthesizes the findings from FOA and SCA to assess whether the proposed JOs structure provides adequate economic justification as a managerial intervention. JOFA is derived from the difference in structural costs between the standalone and JOs scenarios identified through the SCA analysis and it's calculated through dividing the structural cost saving obtained upon the JOs scenario with standalone structural cost.

Based on the SCA results, standalone structural cost amounts to IDR 58.03 billion, while the JOs scenario reduces structural cost to IDR 50.61 billion, resulting in total savings of IDR 7.43 billion or equal to 12,7 %.

4.5.2 JOFA Quantitative Financial Assessment

The resulting JOFA score is 12.8%, indicating that the JOs structure provides a *medium-to-strong* level of economic feasibility. This level of efficiency improvement is considered as material in the context of natural forest concession management, where cost structures are often characterized by high operational rigidity and limited opportunities for rapid cost reduction. The ability to reduce structural costs by more than ten percent suggests that JOs can meaningfully improve organizational efficiency while maintaining operational continuity.

Table 16 Comparison of Structural Cost for Two Operation Scenarios

Item	Calculation	Result
Standalone structural cost per m^3	58,034,428,601 / 25,000	2,321,377
JOs structural cost per m^3	50,609,416,912 / 25,000	2,024,377
Saving per m^3	7,425,011,689 / 25,000	297,000

Source: Internal Data reprocessed in Excel

Further interpretation of the JOFA results shows that structural cost per unit production decreases from approximately IDR 2.32 million per m3 under the standalone scenario to approximately IDR 2.02 million per m3 under the JOs scenario. This represents an estimated efficiency gain of approximately IDR 297 thousand per m3. Despite the high structural efficiency improvement, the financial projection indicates that total structural cost remains higher than projected revenue under current assumptions. Using an estimated combined revenue of IDR 45 billion, the structural margin remains negative in both scenarios.

Table 17 The Structural Margin Comparison between Standalone and Joint operations

Scenario	Structural Margin
Standalone	– IDR 13.03 billion
Joint operation	– IDR 5.61 billion

Source: Internal Data reprocessed in Excel

This finding suggests that while JOs substantially improves financial performance, it does not fully resolve structural margin pressure when implemented in isolation. Therefore, JOs should be interpreted as an enabling intervention that improves Cost reduction and governance structure, rather than as a standalone solution to overall profitability challenges. The results have also indicated that JOs is financially viable and capable of improving structural efficiency.

4.5.3 JOFA Qualitative Scorecard

Respondents representing key managerial functions were asked to evaluate five dimensions of JOs impact using a *Likert scale* from 1 (very low) to 5 (very high). The dimensions include *Cost reduction improvement, potential revenue enhancement, reduction of duplicated functions, improvement of management effectiveness, and implementation risk.* The inclusion of risk as a separate dimension ensures that feasibility assessment considers not only efficiency gains, but also organizational challenges associated with structural change.

The results show that respondents generally perceive JOs as having a positive impact on Cost reduction and reduction of duplicated functions. Scores for reduction of duplicated functions consistently reached a value of 4 across respondents, indicating strong agreement that JOs can address structural overlap identified in FOA. This finding is consistent with the FOA results which demonstrate a medium to high degree of similarity and integration potential across several support functions. Perceptions regarding Cost reduction are also relatively positive, with most respondents assigning scores of 3 or 4. This assessment aligns with the SCA findings which indicate structural cost savings of approximately 12.8%, primarily derived from reductions in indirect and overhead cost components.

On the other hand, respondents provided relatively low scores for potential revenue improvement, with most responses indicating a score of 1. This suggests that JOs is not expected to directly increase revenue in the short term but rather functions primarily as a structural efficiency intervention. This perception is consistent with the analytical logic of the study, where JOs is positioned as a cost rationalization strategy rather than a market expansion strategy.

Perceived management effectiveness received medium scores of 3, indicating that JOs is expected to improve coordination and governance, although the magnitude of improvement may depend on implementation design and clarity of roles and responsibilities. The risk dimension received scores between 2 and 3, indicating Medium perceived implementation risk. These risks may include transitional organizational complexity, adjustment of reporting lines, and the need to harmonize procedures across entities.

Nevertheless, the average respondent score ranges between 2.60 and 2.80, indicating a medium level of support for JOs implementation. The qualitative findings suggest that JOs is generally perceived as beneficial in improving structural efficiency, although careful implementation planning remains necessary to manage organizational risks and maintain alignment of management processes.

Although JOs offers significant efficiency potential, the findings indicate several governance and implementation risks. The primary risks include ambiguity in cross-entity authority, disputes regarding cost allocation, inconsistent accountability for shared activities, and transitional coordination complexity during implementation. The JOs Impact Scorecard indicates that management generally views implementation risk as moderate. Respondents recognize the potential efficiency benefits but emphasize the importance of governance clarity and organizational alignment.

To mitigate these risks, formal governance mechanisms are required. These include explicit decision-right structures, transparent cost allocation methodologies, simplified reporting arrangements, and clearly defined accountability boundaries for shared resources and activities.

The study further indicates that JOs should not be implemented as a full organizational merger. Instead, a selective integration model is more appropriate, where support functions are consolidated while operational functions remain decentralized. The principal risks associated with JOs relate to governance ambiguity and coordination complexity. These risks can be mitigated through formal governance instruments, including a Joint Operations Charter, Delegation of Authority Matrix, Cost Allocation Manual, and structured monitoring mechanisms

4.6 Synthesis of Findings

The findings indicate that JOs generate efficiency primarily through consolidation of support functions rather than operational functions. FOA identifies substantial overlap across planning, compliance, certification, and administrative activities, while SCA quantifies the resulting cost reduction potential. GEI results further demonstrate that organizational integration can improve accountability and reporting clarity, although governance risks remain if authority boundaries are not formalized. Taken together, the findings suggest that a selective integration model provides the most appropriate balance between efficiency and operational responsiveness.

CHAPTER 5

CONCLUSION, RECOMMENDATION, FUTURE WORK

5.1 Conclusion

This project evaluates Joint Operations (JOs) as a managerial intervention to address structural cost pressure and governance inefficiencies in PBPH natural forest concessions, using PT X and PT Y as the case study. The findings show that JOs is considered effective in improving structural efficiency, but only within a specific scope.

1. JOs reshapes the cost structure by reducing duplication in support and overhead functions. The analysis shows a reduction in overhead ratio from 8% to 5% and total structural cost savings of 12.8% (IDR 7.43 billion). This confirms that JOs is an effective lever for addressing structural inefficiency.
2. The efficiency gains are not uniform across all cost components. The impact is concentrated in indirect and overhead costs—particularly in planning, compliance, administration, logistics, and sustainability coordination. In contrast, direct production costs remain largely unchanged, indicating that JOs improves organizational efficiency rather than operational productivity.
3. JOs improves governance effectiveness. The results indicate clearer reporting lines, better cost accountability, and more structured coordination mechanisms. Importantly, these improvements are achieved without compromising permit-level accountability, which remains critical under PBPH regulatory requirements.

However, JOs is not a complete solution. Despite cost improvements, structural margin remains negative under current assumptions. This indicates that JOs should be positioned as a cost-efficiency enabler, not as a standalone strategy for profitability. In addition, JOs introduces implementation risks. Key challenges include ambiguity in *cross-entity decision-making, lack of standardized cost allocation mechanisms, and transitional coordination complexity*. Without proper governance design, these risks may reduce or even offset the expected efficiency gains.

Therefore, the study concludes that JOs is a viable managerial intervention, but its success depends on selective implementation, clear governance design, and alignment with broader operational and financial strategies.

5.2 Practical Implications for PBPH Natural Forest

The findings of this study demonstrate that Joint Operations (JOs) can serve as a practical organizational mechanism for addressing structural cost pressures commonly experienced by natural forest concession companies operating under the same ownership structure. The analysis indicates that the greatest efficiency opportunities originate from the consolidation of duplicated support and governance functions rather than from reductions in core production activities. Consequently, organizations seeking to improve cost efficiency should prioritize the integration of planning, compliance, certification, finance support, procurement, information management, and administrative functions while maintaining operational activities at the permit level.

For PBPH companies facing increasing sustainability compliance requirements, JOs offers an alternative to full organizational merger by enabling resource sharing without altering permit ownership or regulatory accountability. The findings further suggest that efficiency improvements can be achieved without compromising operational performance, if integration is implemented selectively and supported by appropriate governance arrangements. Therefore, JOs may represent a practical organizational model for forestry companies seeking to balance operational efficiency, regulatory compliance, and sustainability performance under increasingly constrained business conditions

5.3 Managerial Implications for PT X, PT Y and PT Z

From a managerial perspective, the study provides evidence that organizational efficiency should be viewed not only as a function of production performance but also because of organizational design. The findings suggest that management attention should focus on eliminating duplicated organizational structures that no longer create additional value when multiple entities operate within the same business environment.

For PT X and PT Y, the results support the implementation of a selective shared-services model in which planning, compliance, sustainability management, procurement, finance support, information technology, and administrative functions are coordinated jointly. At the same time, operational functions directly related to harvesting activities, field supervision, production control, and permit-specific responsibilities should remain decentralized to preserve operational responsiveness and regulatory accountability.

For PT Z as the holding company, the study highlights the importance of establishing governance mechanisms capable of coordinating shared functions across subsidiaries. The successful implementation of JOs requires clear authority structures, transparent cost

allocation principles, formal coordination procedures, and performance monitoring mechanisms. Without these governance instruments, structural integration may create ambiguity and coordination challenges that offset expected efficiency gains.

More broadly, the findings suggest that JOs may serve as a strategic alternative to merger or full organizational consolidation within the forestry sector, particularly where multiple concession entities operate within the same geographic landscape and ownership structure. Management should therefore evaluate organizational integration not solely as a financial initiative but as a strategic governance intervention designed to improve both efficiency and accountability.

The findings provide several clear managerial implications for PBPH companies, notably:

1. The main source of inefficiency is structural, not operational. Cost pressure in PT X and PT Y is driven more by duplicated organizational functions and compliance burden than by field operations. Therefore, management should focus on redesigning organizational structure rather than attempting to reduce core production costs.
2. JOs should be applied selectively. Not all functions should be integrated. The strongest candidates are support functions with high overlap—such as planning, compliance, administration, and sustainability coordination. Core operational activities should remain independent to preserve flexibility and site responsiveness.
3. Governance design is critical. Efficiency gains from JOs will only materialize if decision rights, cost allocation rules, and reporting structures are clearly defined. Without this, JOs can create more coordination problems instead of solving them.
4. JOs should be positioned as part of a broader strategy. While it improves Cost reduction, it does not fully resolve profitability challenges. Companies must combine JOs with other initiatives such as production optimization, cost control discipline, and revenue enhancement strategies.

5.3 Recommendations for JOs Implementation

Based on the findings of this study, the implementation of Joint Operations (JOs) between PT X and PT Y should be pursued through *a phased and selective integration strategy*.

1. The first phase should prioritize support functions with the highest degree of functional overlap and the lowest implementation risk, including administrative services, Human Resources (HR), Procurement, finance support, certification

preparation, compliance management, information systems, and selected sustainability functions.

2. Subsequent phases may gradually expand integration to planning, sustainability functions, and coordination activities once governance arrangements and operating procedures have been established and tested.
3. Core operational functions (e.g., harvesting and field execution) should remain under decentralized control at the entity level, while execution may be selectively outsourced to contractors under strict supervision, performance-based contracts, and compliance control mechanisms to ensure operational responsiveness and regulatory accountability.
4. To support implementation, management should formalize the governance architecture of JOs through the development of a *Joint Operations Charter* that clearly defines objectives, scope, responsibilities, and accountability mechanisms. A *Delegation of Authority (DOA) Matrix* should be established to clarify decision rights for shared resources and cross-entity activities, while a *Cost Allocation Manual* should be developed to ensure transparency and consistency in the allocation of shared costs. In addition, management should establish a *JO Performance Dashboard* containing financial, operational, and governance indicators to monitor implementation effectiveness and support continuous improvement.
5. The findings further suggest that JOs should not be viewed as a standalone solution for profitability improvement. While JOs significantly improves structural cost saving, long-term financial sustainability will also depend on production scale optimization, operational productivity improvements, market development, certification value realization, and the development of complementary revenue streams such as ecosystem services and carbon-related opportunities.

5.4 Governance Design

Successful JOs requires clear governance rules from the beginning. Decision authority must be explicitly defined, especially for shared resources and cross-entity activities. Cost allocation mechanisms must be standardized and based on clear drivers (e.g., volume, activity level, or headcount) to avoid disputes and improve transparency. Reporting structures should be simplified to eliminate dual reporting lines and reduce coordination complexity. Without these elements, JOs risks creating ambiguity rather than efficiency.

5.5 Strategic Positioning of JOs

JOs should not be treated as a standalone solution. Management must recognize that JOs improves cost structure, but it does not automatically improve profitability. Therefore, JOs should be integrated with production scale optimization, operational efficiency improvement, revenue and pricing strategies and sustainability value creation (e.g., FSC, carbon).

5.6 Future Research

Future research should evaluate the actual post-implementation performance of Joint Operations after the organizational design has been fully implemented. Since this study adopts an ex-ante intervention assessment approach, the findings primarily represent projected efficiency and governance outcomes derived from organizational analysis, financial simulations, and managerial assessments. A longitudinal study conducted after implementation would provide valuable evidence regarding the extent to which projected benefits are realized in practice.

Future studies may also expand the scope beyond two PBPH entities operating under a single holding structure. Comparative studies involving multiple concession companies, different ownership arrangements, and varying operational scales would improve the generalizability of findings and strengthen understanding of the conditions under which JOs creates value. In addition, future research could examine the effects of JOs on broader organizational outcomes, including employee engagement, organizational culture, innovation capability, sustainability performance, and long-term competitiveness. Finally, the integrated framework developed in this study combining FOA, SCA, JOFA, and GEI may be tested and refined in other natural-resource industries to assess its applicability as a managerial decision-support tool for organizational integration initiatives.

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Appendix 1 FOA Result

FOA – Ringkasan Otomatis per Aktivitas									
Activity_ Code	**Activity_Name**	**N**	**Avg_ Similarity**	**Avg_ Interdependence**	**Avg_ Integration**	**Avg_FOA_ Index**	**Kategori (auto)**	**Avg_FOA_ PT X**	**Avg_FOA_ PT Y**
F01	Inventarisasi Tegakan Sebelum Tebangan (ITSP)	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F02	Penataan Areal Kerja (PAK)	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F03	Persiapan Pembukaan Wilayah Hutan (PPWH)	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F04	Pembukaan Wilayah Hutan (PWH)	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F05	Monitoring Tutupan Lahan	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F06	Penerbitan RKUPH	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F07	Penerbitan RKTPH	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F08	Pembuatan trace jalan (jalan sarad, jalan cabang dan jalan utama)	4	4,75	2,25	4,25	3,75	Layak JO	3,89	3,33
F09	Pembuatan Jalan Sarad	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F10	Penebangan (Felling)	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F11	Penyaradan (Skidding)	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F12	Pengangkutan (Hauling)	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F13	Deaktivasi	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F14	Tata Usaha Kayu (TUK)	3	5,00	3,67	4,33	4,33	Layak JO	4,67	3,67
F15	Pengumpulan data untuk kegiatan pemenuhan sertifikasi (PHPL/FSC)	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F16	Pengembangan dashboard arsip terkait data2 untuk pemenuhan sertifikasi	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F17	Mengkoordinir penutupan gap temuan dari kegiatan sertifikasi PHPL/FSC	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F18	Memastikan kegiatan operasional berjalan sesuai dengan standar PHPL/FSC	2	4,50	3,50	4,00	4,00	Layak JO	4,00	

F19	Mengidentifikasi resiko ketidakpatuhan dan rekomendasi merujuk dari standar PHPL/FSC	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F20	Menyusun laporan hasil kegiatan sertifikasi PHPL/FSC	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F21	Mendampingi dan terlibat dalam kegiatan Research and Development (RnD)	2	4,50	3,50	4,00	4,00	Layak JO	4,00	
F22	Melakukan patroli dan monitoring kegiatan K3	2	4,50	1,00	4,50	3,33	Layak JO	3,33	
F23	Melakukan Inspeksi APD, Inspeksi K3 & Lingkungan pada Kegiatan Operasional	2	4,50	1,00	4,50	3,33	Layak JO	3,33	
F24	Melakukan sosialisasi dan promosi K3	2	4,50	1,00	4,50	3,33	Layak JO	3,33	
F25	Pemeriksaan Peralatan dan Perlengkapan K3	2	5,00	1,00	4,50	3,50	Layak JO	3,50	
F26	Melakukan meeting P2K3	2	4,50	1,00	3,50	3,00	Layak JO	3,00	
F27	Penyusunan Dokumen Rintek & Pertek	2	4,50	1,50	3,00	3,00	Layak JO	3,00	
F28	Pembangunan TPS LB3 dan instalasi pengelolaan air limbah (IPAL)	2	4,00	1,00	3,00	2,67	Perlu Kajian lanjutan	2,67	
F29	Melaksanakan pemantauan lingkungan	2	5,00	1,50	3,00	3,17	Layak JO	3,17	
F30	Menyusun laporan pengelolaan limbah dan sampah domestik	2	4,00	1,00	3,00	2,67	Perlu Kajian lanjutan	2,67	
F31	Melaporkan kegiatan pengelolaan lingkungan (RKL/RPL)	2	5,00	1,00	3,50	3,17	Layak JO	3,17	
F32	Melaporkan hasil inspeksi K3 & lingkungan pada kegiatan operasional kepada pimpinan MU	2	5,00	1,00	3,50	3,17	Layak JO	3,17	
F33	Simulasi Tanggap Darurat (Pertolongan Pertama Pada Kecelakaan Kerja/P3K Karyawan & Pekerja Pemanenan), Simulasi Tanggap darurat kebakaran & Simulasi tanggap darurat Tumpahan B3/LB3	2	5,00	1,00	3,50	3,17	Layak JO	3,17	
F34	Mengkoordinir pelaksanaan MCU karyawan	2	5,00	1,00	3,50	3,17	Layak JO	3,17	
F35	Pelaporan dan pengurusan izin kepada dinas terkait	2	5,00	1,00	3,50	3,17	Layak JO	3,17	

F36	Menyusun rencana kegiatan penanaman setiap tahun berjalan (merujuk dari blok RKT)	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F37	Persemaian (pengadaan bibit dan pemeliharaan bibit)	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F38	Persiapan penanaman	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F39	Penanaman	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F40	Monitoring penanaman secara berkala	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F41	Menyusun rencana pengelolaan dan pemantauan area HCV	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F42	Melakukan kegiatan pengelolaan dan pemantauan merujuk dokumen ManPlan HCV	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F43	Menyusun dan mendistribusikan dokumen laporan hasil pengelolaan dan pemantauan HCV	2	5,00	3,00	5,00	4,33	Layak JO	4,33	
F44	Mengelola dan mengoperasikan sistem grievance mechanism perusahaan sesuai SOP yang berlaku	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F45	Menerima, mencatat, mengklasifikasikan, dan memverifikasi setiap pengaduan atau potensi konflik yang muncul	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F46	Memastikan respon awal atas pengaduan diberikan dalam batas waktu maksimal 20 hari kalender	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F47	Memfasilitasi proses mediasi, dialog, dan penyelesaian konflik secara partisipatif dan berbasis bukti	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F48	Mendokumentasikan seluruh proses dan hasil kesepakatan dengan para pihak secara tertulis dan terdokumentasi dengan baik	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F49	Melakukan pemetaan risiko konflik sosial (conflict risk mapping) dan memperbaruinya setiap triwulan	2	4,50	3,00	3,50	3,67	Layak JO	3,67	
F50	Sosialisasi terkait kegiatan operasional	3	4,33	3,00	3,33	3,56	Layak JO	3,67	3,33
F51	Engagement dengan stakeholder	3	4,33	3,33	3,33	3,67	Layak JO	3,67	3,67

F52	Menyusun rencana kegiatan terkait dengan dampak sosial (SIA)	3	4,33	3,33	3,67	3,78	Layak JO	3,67	4,00
F53	Melakukan monitoring dampak sosial	3	4,33	3,33	3,67	3,78	Layak JO	3,67	4,00
F54	Mendampingi masyarakat dalam pemanfaatan HHBK	3	3,33	3,00	3,33	3,22	Layak JO	3,67	2,33
F55	Monitoring kegiatan pemanfaatan HHBK oleh masyarakat	3	3,33	3,00	3,33	3,22	Layak JO	3,67	2,33
F56	HR: Menyusun panduan rekrutmen staff/karyawan, SOP, administrasi ke HR an, skala upah dan Comben dll	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F57	HR: Melakukan proses rekrutmen (Hiring process)	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F58	HR: Melakukan penginputan BPJS Kesehatan dan TK	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F59	IR: Pelaporan Disnaker, Badan Pengawas, HI dll)	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F60	GA: Aset inventory, purchase dll	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F61	GA: Handling untuk kebutuhan operasional office dan Camp (BAMA, BBM dll)	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F62	OD: Monitoring performance staff/karyawan merujuk dari job desk, KPI dan performance	1	5,00	1,00	5,00	3,67	Layak JO	3,67	
F63	TM: Mengkoordinir kegiatan training, sosialisasi di level kebijakan perusahaan, sertifikasi, peningkatan mutu, engagement staff/karyawan	1	5,00	1,00	5,00	3,67	Layak JO	3,67	

Notes:

1. **Appendix 1** presents separate average FOA scores for PT X and PT Y. Some rows show missing values under Average FOA of PT Y because: 1). the activity is currently performed only by PT X; 2). PT Y has not yet established the corresponding function and 3). There was no respondent representing the work unit. This condition does not indicate absence of integration potential. Instead, missing values indicate that the function has not yet been fully operationalized within PT Y.
2. From an Action Research perspective, this strengthens the case for JO, because: 1). shared structure can accelerate organizational maturity and 2). PT Y does not need to duplicate all support functions independently. Therefore, missing FOA scores for PT Y can be interpreted as evidence that integration (JO) can reduce the need to build parallel organizational structure.

Appendix 2 Structure Cost Budget FY 2025 (Baseline)

No		Kode	Cost_Component	Kategori (L/TL/OH/CAPEX)	PT X (IDR)	PT Y (IDR)	Shared? (Y/N)
1			**Perencanaan**		**1.345.831.400**	**1.232.848.260**	
	1,1		Penataan Area Kerja (PAK) 2026 + 2027	L	109.600.000	98.640.000	Y
	1,2		Inventarisasi Tegakan Sebelum Penebangan (ITSP)	L	492.310.000	443.079.000	Y
	1,3		Pengesahan RKT 2025	TL	16.000.000	16.000.000	N
	1,4		Penyusunan RKU (revisi)	TL	300.000.000	300.000.000	Y
	1,5		Tata Batas Konsesi	TL	40.000.000	0	N
	1,6		Update Citra Landsat	TL	20.000.000	20.000.000	Y
	1,7		PPWH (Rencana pembuatan jalan untuk produksi; jalan angkutan, sarad, buffer zone dan TPN)	L	227.921.400	205.129.260	Y
	1,8		Pengukuhan batas konsesi (ijin pengukuhan batas konsesi)	TL	140.000.000	150.000.000	N
2			**Produksi**		**25.011.838.632**	**23.288.794.769**	
	2,1		**Operational Logfisher + alat berat (BBM, oli, service dll)**			**0**	**Y**
		2.1.1	BBM	L	6.872.000.000	6.184.800.000	Y
		2.1.2	Oli	L	274.000.000	246.600.000	Y
		2.1.3	Sparepart	L	772.800.000	695.520.000	Y
	2,2		**Operational mobil produksi (BBM, oli, service dll)**			**0**	**Y**
		2.2.1	BBM	L	422.400.000	506.880.000	Y
		2.2.2	Biaya sewa mobil (2 unit)	L	552.000.000	662.400.000	Y
		2.2.3	Sparepart	L	29.400.000	35.280.000	Y
	2,3		Pengurusan ijin (tersus dll)	TL	100.000.000	100.000.000	Y
	2,4		Kontraktor logging (operational cost, manpower, fee kayu dll)	L	3.936.123.632	3.542.511.269	Y
	2,5		**Road maintenance**			**0**	**Y**
		2.5.1	BBM	L	211.200.000	253.440.000	Y
		2.5.2	Upah tenaga	L	19.800.000	23.760.000	Y
	2,6		Pajak PBB	TL	750.000.000	750.000.000	N

	2,7		Pajak DR PSDH	L	5.027.000.000	5.027.000.000	N
	2,8		Pajak lainnya	TL	0	0	N
	2,9		RIL - C Implementasi	L	200.000.000	0	Y
	2.10		Purchase alat berat (12 unit) -- CAPEX	L	5.845.115.000	5.260.603.500	Y
	2.11		Purchase mobil 4WD (2 unit) -- CAPEX	L	0	0	Y
3			**Sustainability Compliance**		**2.904.850.000**	**1.859.900.000**	
	3,1		Binhut -- survey lokasi	L	1.000.000	1.000.000	N
	3,2		Binhut -- pembangunan persemaian	TL	85.000.000	76.500.000	Y
	3,3		Binhut -- persiapan penanaman (pembuatan kompos, penyediaan bibit, pemeliharaan dll)	L	80.000.000	72.000.000	Y
	3,4		Binhut -- penanaman	TL	200.000.000	180.000.000	N
	3,5		Lingkungan -- penyusunan dokling RKL/RPL	TL	18.000.000	18.000.000	N
	3,6		Lingkungan -- monitoring untuk pemenuhan mandatory dan voluntary	TL	190.000.000	190.000.000	N
	3,7		Lingkungan -- analisa tanah	TL	47.000.000	47.000.000	N
	3,8		Lingkungan -- pengurusan limbah B3	TL	150.000.000	150.000.000	N
	3,9		Lingkungan -- pencegahan dan penanggulangan kebakaran	TL	40.000.000	40.000.000	Y
	3.10		Lingkungan -- Pembelian alat monitoring	TL	18.000.000	18.000.000	Y
	3.11		K3 -- kesehatan dan keselamatan kerja	TL	0	0	Y
	3.12		K3 -- Pengadaan APD	TL	45.000.000	45.000.000	Y
	3.13		Litbang -- umum	TL	50.000.000	30.000.000	Y
	3.14		Sosial -- Sosialisasi kegiatan operasional	TL	10.000.000	12.000.000	Y
	3.15		Sosial -- Fasilitasi pertemuan para pihak	TL	30.000.000	32.000.000	Y
	3.16		Sosial -- Pendampingan kelola sosial	TL	40.000.000	40.000.000	Y
	3.17		Sosial -- Pengembangan komoditas lestari	TL	3.000.000	3.000.000	Y
	3.18		Sosial -- Pengadaan peralatan patroli	TL	89.000.000	89.000.000	Y

	3.19		Social conflit resolution	TL	500.000.000	600.000.000	Y
	3.20		Social CSR -- masyarakat	TL	52.000.000	62.400.000	Y
	3.21		Sertifikasi -- Biaya audit (PHPL, FSC)	TL	220.000.000	154.000.000	N
	3.22		Sertifikasi -- Pelaksanaan pemenuhan kegiatan untuk mendapatkan sertifikasi FSC	TL	1.036.850.000	0	Y
4			**HRGA**		**6.983.491.600**	**6.550.592.440**	
	4,1		Salaries dan benefit karyawan	TL	4.982.791.600	4.484.512.440	N
	4,2		Industrial Relation	OH	64.000.000	64.000.000	Y
	4,3		Travel staff (all)	OH	212.000.000	190.800.000	Y
	4,4		Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Kantor Redeb	OH	656.200.000	590.580.000	Y
	4,5		Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Camp	OH	849.500.000	1.019.400.000	Y
	4,6		Sewa Office -- Virtual office Jakarta	OH	7.000.000	7.000.000	Y
	4,7		Sewa Office -- Tj Redeb	OH	35.000.000	35.000.000	Y
	4,8		Staff development (training dll)	OH	177.000.000	159.300.000	Y
5			**Finance dan accounting**		**189.000.000**	**189.000.000**	
	5,1		Biaya pengurusan dokument legal perpajakan, dll	OH	109.000.000	109.000.000	N
	5,2		Biaya audit keuangan	OH	80.000.000	80.000.000	N
GRANDTOTAL					**36.435.011.632**	**33.121.135.469**	

Appendix 3 Structure Cost Budget FY 2026 (JO Intervention)

No			Cost_Component	Kategori (L/TL/OH/CAPEX)	PT X (IDR)	PT Y (IDR)	Shared? (Y/N)
1			**Perencanaan**		**1.149.395.787**	**819.577.051**	
	1,1		Penataan Area Kerja (PAK) 2026 + 2027	L	97.762.580	68.433.806	Y
	1,2		Inventarisasi Tegakan Sebelum Penebangan (ITSP)	L	759.884.502	531.919.151	Y
	1,3		Pengesahan RKT 2025	TL	40.000.000	40.000.000	N
	1,4		Penyusunan RKU (revisi)	TL	0	0	Y
	1,5		Tata Batas Konsesi	TL	0	0	N
	1,6		Update Citra Landsat	TL	10.000.000	10.000.000	Y
	1,7		PPWH (Rencana pembuatan jalan untuk produksi; jalan angkutan, sarad, buffer zone dan TPN)	L	241.748.705	169.224.094	Y
	1,8		Pengukuhan batas konsesi (ijin pengukuhan batas konsesi)	TL	0	0	N
2			**Produksi**		**24.396.748.632**	**17.157.179.316**	
	2,1		**Operational Logfisher + alat berat (BBM, oli, service dll)**				
		2.1.1	BBM	L	7.329.750.000	5.130.825.000	Y
		2.1.2	Oli	L	380.900.000	266.630.000	Y
		2.1.3	Sparepart	L	935.000.000	654.500.000	Y
	2,2		**Operational mobil produksi (BBM, oli, service dll)**				
		2.2.1	BBM	L	174.000.000	121.800.000	Y
		2.2.2	Biaya sewa mobil (2 unit)	L	138.000.000	138.000.000	Y
		2.2.3	Sparepart	L	14.700.000	14.700.000	Y
	2,3		Pengurusan ijin (tersus dll)	TL	50.000.000	50.000.000	Y
	2,4		Kontraktor logging (operational cost, manpower, fee kayu dll)	L	4.095.773.632	2.047.886.816	Y
	2,5		**Road maintenance**				
		2.5.1	BBM	L	0	0	Y
		2.5.2	Upah tenaga	L	107.625.000	75.337.500	Y
	2,6		Pajak PBB	TL	750.000.000	750.000.000	N
	2,7		Pajak DR PSDH	L	7.540.500.000	5.027.000.000	N

	2,8		Pajak lainnya	TL	88.000.000	88.000.000	N
	2,9		RIL - C Implementasi	L	42.500.000	42.500.000	Y
	2.10		Purchase alat berat (3 unit) -- CAPEX	L	2.550.000.000	2.550.000.000	Y
	2.11		Purchase mobil 4WD (2 unit) -- CAPEX	L	200.000.000	200.000.000	Y
3			**Sustainability Compliance**		**2.619.035.000**	**2.043.935.000**	
	3,1		Binhut -- survey lokasi	L	500.000	500.000	N
	3,2		Binhut -- pembangunan persemaian	TL	40.000.000	40.000.000	Y
	3,3		Binhut -- persiapan penanaman (pembuatan kompos, penyediaan bibit, pemeliharaan dll)	L	195.000.000	136.500.000	Y
	3,4		Binhut -- penanaman	TL	255.000.000	229.500.000	N
	3,5		Lingkungan -- penyusunan dokling RKL/RPL/HCV report	TL	160.500.000	160.500.000	N
	3,6		Lingkungan -- monitoring untuk pemenuhan mandatory dan voluntary	TL	187.000.000	190.000.000	N
	3,7		Lingkungan -- analisa tanah	TL	0	0	N
	3,8		Lingkungan -- pengurusan limbah B3	TL	125.000.000	125.000.000	N
	3,9		Lingkungan -- pencegahan dan penanggulangan kebakaran	TL	103.000.000	40.000.000	Y
	3.10		Lingkungan -- Pembelian alat monitoring	TL	47.400.000	47.400.000	Y
	3.11		K3 -- kesehatan dan keselamatan kerja	TL	39.500.000	39.500.000	Y
	3.12		K3 -- Pengadaan APD	TL	75.000.000	75.000.000	Y
	3.13		Litbang -- umum	TL	10.000.000	10.000.000	Y
	3.14		Sosial -- Sosialisasi kegiatan operasional	TL	61.650.000	61.650.000	Y
	3.15		Sosial -- Fasilitasi pertemuan para pihak	TL	62.150.000	62.150.000	Y
	3.16		Sosial -- Pendampingan kelola sosial	TL	274.550.000	274.550.000	Y
	3.17		Sosial -- Pengembangan komoditas lestari	TL	33.500.000	33.500.000	Y
	3.18		Sosial -- Pengadaan peralatan patroli	TL	0	0	Y
	3.19		Social conflit resolution	TL	185.785.000	185.785.000	Y
	3.20		Social CSR -- masyarakat	TL	45.000.000	45.000.000	Y
	3.21		Sertifikasi -- Biaya audit (PHPL, FSC)	TL	327.500.000	131.000.000	N

	3.22		Sertifikasi -- Pelaksanaan pemenuhan kegiatan untuk mendapatkan sertifikasi FSC	TL	391.000.000	156.400.000	Y
4			**HRGA**		**4.550.659.559**	**3.662.186.567**	
	4,1		Salaries dan benefit karyawan	TL	3.396.654.426	2.494.181.433	N
	4,2		Industrial Relation	OH	51.855.000	51.855.000	Y
	4,3		Travel staff (all)	OH	220.000.000	234.000.000	Y
	4,4		Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Kantor Redeb	OH	162.520.000	162.520.000	Y
	4,5		Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Camp	OH	543.796.800	543.796.800	Y
	4,6		Sewa Office -- Virtual office Jakarta	OH	3.500.000	3.500.000	Y
	4,7		Sewa Office -- Tj Redeb	OH	20.833.334	20.833.334	Y
	4,8		Staff development (training dll)	OH	151.500.000	151.500.000	Y
5			**Finance dan accounting**		**145.000.000**	**145.000.000**	
	5,1		Biaya pengurusan dokument legal perpajakan, dll	OH	95.000.000	95.000.000	N
	5,2		Biaya audit keuangan	OH	50.000.000	50.000.000	N
GRANDTOTAL					**32.860.838.978**	**23.827.877.933**	

Appendix 4 Structure Cost Analysis (SCA) Result

Jenis Biaya	Alokasi	PT X 2025 Budget	PT Y 2025 Budget	Total Biaya Standalone 2025	Biaya JO 2026	Penghematan	Persentase Penghematan	Scope SCA	Shared or Not
Perencanaan									
Penataan Area Kerja (PAK) 2026 + 2027	L	109.600.000	98.640.000	208.240.000	166.196.386	42.043.614	20,2%	Include	Y
Inventarisasi Tegakan Sebelum Penebangan (ITSP)	L	492.310.000	443.079.000	935.389.000	1.291.803.653	(356.414.653)	-38,1%	Include	Y
Pengesahan RKT 2025	TL	16.000.000	16.000.000	32.000.000	80.000.000	(48.000.000)	-150,0%	Include	N
Penyusunan RKU (revisi)	TL	300.000.000	300.000.000	600.000.000	-	600.000.000	100,0%	Include	Y
Tata Batas Konsesi	TL	40.000.000	-	40.000.000	-	40.000.000	100,0%	Include	N
Update Citra Landsat	TL	20.000.000	20.000.000	40.000.000	20.000.000	20.000.000	50,0%	Include	Y
PPWH (Rencana pembuatan jalan untuk produksi; jalan angkutan, sarad, buffer zone dan TPN)	L	227.921.400	205.129.260	433.050.660	410.972.799	22.077.861	5,1%	Include	Y
Pengukuhan batas konsesi (ijin pengukuhan batas konsesi)	TL	140.000.000	150.000.000	290.000.000	-	290.000.000	100,0%	Include	N
Produksi									
Operational Logfisher + alat berat (BBM, oli, service dll)									
BBM	L	6.872.000.000	6.184.800.000	13.056.800.000	12.460.575.000	596.225.000	4,6%	Include	Y
Oli	L	274.000.000	246.600.000	520.600.000	647.530.000	(126.930.000)	-24,4%	Include	Y
Sparepart	L	772.800.000	695.520.000	1.468.320.000	1.589.500.000	(121.180.000)	-8,3%	Include	Y
Operational mobil produksi (BBM, oli, service dll)									
BBM	L	422.400.000	506.880.000	929.280.000	295.800.000	633.480.000	68,2%	Include	Y
Biaya sewa mobil (2 unit)	L	552.000.000	662.400.000	1.214.400.000	276.000.000	938.400.000	77,3%	Include	Y
Sparepart	L	29.400.000	35.280.000	64.680.000	29.400.000	35.280.000	54,5%	Include	Y
Pengurusan ijin (tersus dll)	TL	100.000.000	100.000.000	200.000.000	100.000.000	100.000.000	50,0%	Include	Y
Kontraktor logging (operational cost, manpower, fee kayu dll)	L	3.936.123.632	3.542.511.269	7.478.634.901	6.143.660.448	1.334.974.453	17,9%	Include	Y
Road maintenance									
BBM	L	211.200.000	253.440.000	464.640.000	-	464.640.000	100,0%	Include	Y
Upah tenaga	L	19.800.000	23.760.000	43.560.000	182.962.500	(139.402.500)	-320,0%	Include	Y

Pajak PBB	TL	750.000.000	750.000.000	1.500.000.000	1.500.000.000	-	0,0%	Include	N
Pajak DR PSDH	L	5.027.000.000	5.027.000.000	10.054.000.000	12.567.500.000	(2.513.500.000)	-25,0%	Include	N
Pajak lainnya	TL	-	-	-	176.000.000			Include	N
RIL - C Implementasi	L	200.000.000	-	200.000.000	85.000.000	115.000.000	57,5%	Include	Y
Purchase alat berat (12 unit) -- CAPEX	L	5.845.115.000	5.260.603.500	11.105.718.500	5.100.000.000	6.005.718.500	54,1%	Exclude	Y
Purchase mobil 4WD (2 unit) -- CAPEX	L	-	-	-	400.000.000			Exclude	Y
Sustainability									
Binhut -- survey lokasi	L	1.000.000	1.000.000	2.000.000	1.000.000	1.000.000	50,0%	Include	N
Binhut -- pembangunan persemaian	TL	85.000.000	76.500.000	161.500.000	80.000.000	81.500.000	50,5%	Include	Y
Binhut -- persiapan penanaman (pembuatan kompos, penyediaan bibit, pemeliharaan dll)	L	80.000.000	72.000.000	152.000.000	331.500.000	(179.500.000)	-118,1%	Include	Y
Binhut -- penanaman	TL	200.000.000	180.000.000	380.000.000	484.500.000	(104.500.000)	-27,5%		N
Lingkungan -- penyusunan dokling RKL/RPL	TL	18.000.000	18.000.000	36.000.000	321.000.000	(285.000.000)	-791,7%	Include	N
Lingkungan -- monitoring untuk pemenuhan mandatory dan voluntary	TL	190.000.000	190.000.000	380.000.000	377.000.000	3.000.000	0,8%	Include	N
Lingkungan -- analisa tanah	TL	47.000.000	47.000.000	94.000.000		94.000.000	100,0%	Include	N
Lingkungan -- pengurusan limbah B3	TL	150.000.000	150.000.000	300.000.000	250.000.000	50.000.000	16,7%	Include	N
Lingkungan -- pencegahan dan penanggulangan kebakaran	TL	40.000.000	40.000.000	80.000.000	143.000.000	(63.000.000)	-78,8%	Include	Y
Lingkungan -- Pembelian alat monitoring	TL	18.000.000	18.000.000	36.000.000	94.800.000	(58.800.000)	-163,3%	Exclude	Y
K3 -- kesehatan dan keselamatan kerja	TL	-	-	-	79.000.000	-		Include	Y
K3 -- Pengadaan APD	TL	45.000.000	45.000.000	90.000.000	150.000.000	(60.000.000)	-66,7%	Include	Y
Litbang -- umum	TL	50.000.000	30.000.000	80.000.000	20.000.000	60.000.000	75,0%	Include	Y
Sosial -- Sosialisasi kegiatan operasional	TL	10.000.000	12.000.000	22.000.000	123.300.000	(101.300.000)	-460,5%	Include	Y
Sosial -- Fasilitasi pertemuan para pihak	TL	30.000.000	32.000.000	62.000.000	124.300.000	(62.300.000)	-100,5%	Include	Y
Sosial -- Pendampingan kelola sosial	TL	40.000.000	40.000.000	80.000.000	549.100.000	(469.100.000)	-586,4%	Include	Y
Sosial -- Pengembangan komoditas lestari	TL	3.000.000	3.000.000	6.000.000	67.000.000	(61.000.000)	-1016,7%	Include	Y
Sosial -- Pengadaan peralatan patroli	TL	89.000.000	89.000.000	178.000.000	-	178.000.000	100,0%	Include	Y
Social conflit resolution	TL	500.000.000	600.000.000	1.100.000.000	371.570.000	728.430.000	66,2%	Include	Y
Social CSR -- masyarakat	TL	52.000.000	62.400.000	114.400.000	90.000.000	24.400.000	21,3%	Include	Y

Sertifikasi -- Biaya audit (PHPL, FSC)	TL	220.000.000	154.000.000	374.000.000	458.500.000	(84.500.000)	-22,6%	Include	N
Sertifikasi -- Pelaksanaan pemenuhan kegiatan untuk mendapatkan sertifikasi FSC	TL	1.036.850.000	-	1.036.850.000	547.400.000	489.450.000	47,2%	Include	Y
HRGA									
Salaries dan benefit karyawan	TL	4.982.791.600	4.484.512.440	9.467.304.040	5.890.835.859	3.576.468.181	38%	Include	N
Industrial Relation	OH	64.000.000	64.000.000	128.000.000	103.710.000	24.290.000	19%	Include	Y
Travel staff (all)	OH	212.000.000	190.800.000	402.800.000	454.000.000	(51.200.000)	-13%	Include	Y
Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Kantor Redeb	OH	656.200.000	590.580.000	1.246.780.000	325.040.000	921.740.000	74%	Include	Y
Infrastruktur dan biaya operational (ATK, Starlink, Licenses software dll) -- Camp	OH	849.500.000	1.019.400.000	1.868.900.000	1.087.593.600	781.306.400	42%	Include	Y
Sewa Office -- Virtual office Jakarta	OH	7.000.000	7.000.000	14.000.000	7.000.000	7.000.000	50%	Include	Y
Sewa Office -- Tj Redeb	OH	35.000.000	35.000.000	70.000.000	41.666.667	28.333.333	40%	Include	Y
Staff development (training dll)	OH	177.000.000	159.300.000	336.300.000	303.000.000	33.300.000	10%	Include	Y
Finance dan accounting									
Biaya pengurusan dokument legal perpajakan, dll	OH	109.000.000	109.000.000	218.000.000	190.000.000	28.000.000	13%	Include	N
Biaya audit keuangan	OH	80.000.000	80.000.000	160.000.000	100.000.000	60.000.000	38%	Include	N
TOTAL IN-SCOPE SCA				**58.034.428.601**	**50.609.416.912**	**7.425.011.689**	13%		

Appendix 5 JO Impact Scorecard (Interview Result to Company Leaders)

Respondent_ID	Cost efficient	Revenue improvement	Reduced overlap Function	Management effectiveness	Risks*)	Avg_Score (auto)
Director PT X	4	1	4	3	2	2,80
Director PT Y	3	1	4	3	3	2,80
GM PT Y	2	1	4	3	3	2,60
Camp Manager JO	3	1	4	3	3	2,80
GM PT X	3	1	4	3	3	2,80

*). the higher is the bigger

Appendix 6 The Questionnaires for data collection

Panduan Pertanyaan Kuisioner Penelitian

A.1. Informasi Responden

Nama	:	
Jabatan	:	
Unit	:	
Lama Bekerja di X/Y	:	
Pendidikan terakhir	:	
Pengalaman bekerja di bidang yg sama	:	

A.2. Pertanyaan Umum

Sejauh mana Anda mengetahui tentang alur bisnis sektor kehutanan, khususnya bisnis pemanfaatan hutan alam tropis (PBPH)	:	
Apa yg anda ketahui tentang PT X?		
Apa yg anda ketahui tentang PT Y?		

PART A: Functional Overlapping Analysis (FOA)
Target Respondent: Camp Manager, Finance Manager, Sust Manager, Head of Planning, Head of production, GIS, Sylviculture, Social, HRGA

Section A: Peran dan Tanggung Jawab

Jelaskan job description yang Anda lakukan di posisi ini?	:	
Berapa jumlah anggota yang Anda supervisi dalam unit Anda?	:	
Jelaskan peran dari masing2 anggota didalam unit Anda?	:	
Merujuk dari job description tersebut, jelaskan kegiatan utama yang dilakukan unit Anda secara harian, mingguan, dan bulanan?	:	
Menurut Anda, kegiatan mana yang paling memakan waktu dan sumber daya?		
Menurut Anda, kegiatan mana yang paling kritikal untuk keberhasilan operasonali?		
Menurut anda, apakah ada kegiatan yang tanggung jawabnya belum jelas?		

Section B: Daftar Aktivitas Utama

No	Aktivitas Utama	Deskripsi	Frekuensi
1			
2			
3			

Section C: Penilaian Similarity

1. Aktivitas apa di unit Anda **yang serupa dengan** yang dilakukan unit lain (X/Y)?. Skala 1–5 untuk tingkat kesamaan aktivitas antar unit.

No	Aktivitas	Dilakukan X? (Ya/Tidak)	Dilakukan Y? (Ya/Tidak)	Bentuk Kesamaan Skor (1–5)
1				
2				
3				

Catatan:
1 (Sangat berbeda): output beda, SOP beda, tools beda (hanya nama aktivitas yang mirip)
2 (Berbeda): output mirip tapi SOP/role beda besar
3 (Cukup mirip): output mirip, sebagian SOP sama, tools sebagian sama
4 (Mirip): output sama, SOP hampir sama, tools sama; beda kecil konteks lokasi/volume
5 (Hampir identik): output sama, SOP sama, tools sama, role sama; bisa langsung distandarkan/di-merge

2. Menurut anda, apakah ada aktivitas yang dapat digabungkan antara X dan Y?

Section D: Penilaian Interdependence

1. Aktivitas apa saja yang membutuhkan koordinasi lintas-konsesi?

2. Aktivitas mana yang berpotensi paling besar untuk efisiensi jika dilakukan secara *joint-operation*?

No	Aktivitas	Bentuk Ketergantungan Skor (1 – 5)
1		
2		
3		

Catatan:
1 (Sangat rendah / Independen): hampir tidak butuh koordinasi lintas-konsesi; bisa jalan sendiri 100%
2 (Rendah): kadang butuh informasi/konfirmasi lintas-konsesi, tapi tidak menentukan hasil
3 (Sedang): koordinasi rutin diperlukan; tanpa koordinasi ada delay/inefisiensi, tapi masih bisa jalan
4 (Tinggi): output sangat dipengaruhi input lintas-konsesi; tanpa koordinasi risiko besar (cost, schedule, compliance)
5 (Sangat tinggi / Tightly coupled): aktivitas tidak bisa berhasil tanpa koordinasi lintas-konsesi; satu sistem/proses harus terpadu

Section E: Potensi Integrasi

1. Hambatan apa yang dapat menghalangi integrasi kegiatan antara X dan Y?

2. Sistem atau alat apa yang diperlukan untuk mendukung *joint-operation*?

3. Apakah ada batasan regulasi yang membatasi integrasi fungsi?

4. Aktivitas mana yang membutuhkan keahlian khusus dan dapat dibagi antar perusahaan?

5. Apakah unit Anda memiliki kekurangan atau kelebihan kapasitas SDM/peralatan?

6. Jika *joint-operation* diterapkan, kegiatan mana yang dapat dimerger atau direstrukturisasi?

No	Aktivitas	Alasan	Skor (1 – 5)
1			
2			
3			

Catatan:
1 Sangat rendah ; Aktivitas sulit atau tidak mungkin digabung karena perbedaan sistem, regulasi, atau struktur organisasi yang mendasar;
2 Rendah ; Dapat dipertimbangkan untuk digabung, tetapi memerlukan perubahan besar (SOP, sistem, restrukturisasi signifikan);
3 Sedang ; Dapat digabung dengan penyesuaian moderat pada sistem atau struktur;
4 Tinggi ; Relatif mudah digabung; hanya memerlukan penyesuaian terbatas;
5 Sangat tinggi ; Siap digabung atau disentralisasi; dapat langsung dijalankan sebagai fungsi bersama (shared service / centralized function);

B. Structural Cost Allocation (SCA)

Target Respondent: General Manager, Camp manager, Head of finance, Sustainability, GA dan logistic officer/admin

Section A: Komponen Biaya (Cost Component)

1. Jelaskan struktur biaya operasional perusahaan (biaya langsung, tidak langsung, overhead)?

No	Kategori Biaya (L, TL, OH)	Deskripsi
1		
2		
3		

2. Komponen biaya apa yang paling besar kontribusinya setiap tahun?

No	Kategori Biaya	Deskripsi	Prosentase (%)
1			
2			
3			

Section B: Alokasi Biaya Antar Unit (Khusus Manager Keuangan)

1. Bagaimana alokasi anggaran per unit dilakukan?

2. Apakah biaya tidak langsung dapat ditelusuri dengan jelas ke aktivitas?

3. Cost center apa saja yang ada di perusahaan Anda?

4. Bagaimana metode alokasi biaya diterapkan saat ini

5. Cost center mana yang memiliki transparansi paling rendah?

No	Jenis Biaya	X (%)	Y (%)	Alasan Alokasi
1				
2				

Section C: Identifikasi Inefisiensi

1. Metode alokasi apa yang digunakan (per-m^3, per-ha, headcount, dll)?

2. Biaya apa yang sudah dibagi informal antara X dan Y? Dan komponen biaya mana yang duplikasi?

No	Cost Component	Peluang Duplikasi
1		
2		
3		

3. Fungsi mana yang berpotensi memberikan penghematan biaya terbesar? Dan apakah ada potensi penggabungan biaya?

4. Apakah ada fungsi overhead yang dapat digabung?

5. Bagaimana *joint operation* dapat mempengaruhi distribusi biaya?

6. Apakah ada aset tetap yang bisa digunakan bersama?

7. Tekanan biaya apa yang paling mempengaruhi unit Anda?

8. Perubahan alokasi biaya apa yang paling dibutuhkan untuk meningkatkan efisiensi?

C. JO Financial Advantage (JOFA)
Target Respondent: Director, GM, Camp Manager, Finance Mgr, Sust Mgr, HRGA Mgr

1. Proses operasional mana yang dapat diintegrasikan antara X–Y untuk mencapai efisiensi biaya?

2. Model *joint-operation* apa yang paling realistis (shared HR, MRV, FSC, transportasi, workshop)?

3. Duplikasi apa yang saat ini menyebabkan biaya tidak efisien?

4. Bottleneck operasional apa yang menghambat efisiensi?
5. Jika *joint-operation* diterapkan, fungsi mana yang paling mungkin untuk dikonsolidasikan?

Section A: Data Input Finansial

No	Parameter	X (IDR)	Y (IDR	Keterangan
1	Pendapatan			
2	Biaya Tetap			
3	Biaya Variabel			
4	Biaya Overhead			
5	Biaya RIL-C			
6	CAPEX			
7	OPEX			

Section B: Penilaian Dampak JO
1. Berapa estimasi penghematan biaya yang dapat dicapai?

2. Risiko apa yang mungkin muncul dari integrasi fungsi?
3. Penyesuaian struktur organisasi apa yang diperlukan?
4. Asumsi keuangan apa yang harus dipertimbangkan dalam permodelan JOFA?
5. Indikator finansial mana yang paling terpengaruh oleh *joint operation*?
6. Investasi apa yang dibutuhkan untuk memungkinkan *joint-operation*?
7. Apakah *joint-operation* sejalan dengan strategi jangka panjang Z? Mengapa?
8. Model governance seperti apa yang dibutuhkan untuk menjalankan *joint operation*?
9. Faktor keberhasilan apa yang paling penting dalam implementasinya?

No	**Aspek**	**Dampak**	**Skor (1–5)**
1	Efisiensi biaya		
2	Peningkatan pendapatan		
3	Pengurangan duplikasi fungsi		
4	Efektivitas manajemen		
5	Risiko		