

RESOURCE-BASED COMPETITIVE STRATEGY FOR OIL PALM SEEDLING BUSINESS: A VRIO FRAMEWORK ANALYSIS

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Abstract

Background: The oil palm seedling business represents a critical segment within Indonesia's agribusiness sector. Competition among seedling suppliers in Riau Province has intensified, driven by the proliferation of counterfeit seedlings and expanding smallholder plantation areas, creating substantial demand for certified seedlings.

Purpose: This study examines the sources of competitive advantage in a state-owned enterprise's oil palm seedling business unit using the VRIO framework to identify sustainable competitive advantages and develop strategic recommendations.

Design/methodology/approach: A qualitative single-case study design was employed, combining semi-structured, in-depth interviews with three key internal informants purposively selected based on their roles in the seedling value chain, direct field observations, and internal document analysis. Value chain mapping identified 19 internal resources and capabilities, evaluated in two rounds using a structured VRIO checklist and a focus group discussion to resolve scoring differences across eight contested elements. Consistent with the single case, informant-based approaches to theory elaboration in strategic management research, the design prioritizes analytic depth and internal validity over statistical generalizability.

Findings/Results: Seven elements constitute sustainable competitive advantages: technology utilization in seedling maintenance (CCTV, water sprinkler, sprayer drone), superior seedling quality, standard operating procedures, external network management, online ordering website, corporate reputation, and learning organization. Six elements provide temporary competitive advantage, while the other six represent competitive parity.

Conclusion: Sustainable advantages primarily derive from intangible resources and organizational capabilities rather than physical assets. Six strategic recommendations are proposed: strengthening R&D, enhancing quality monitoring, developing website features, establishing vertical alliances, implementing community programs, and optimizing learning organization practices.

Originality/value: This research demonstrates the application of the VRIO framework in agricultural input markets with credence quality attributes, highlighting how state-owned enterprises can develop sustainable competitive advantages through systematic resource management in quality-sensitive supply chains. The findings are interpreted as organizationally embedded assessments of resource-based competitive position within a single case, intended to elaborate rather than test existing RBV and VRIO propositions.

Keywords: competitive advantage, oil palm seedlings, resource-based view, strategic management, VRIO framework

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INTRODUCTION

Crude palm oil (CPO) represents one of the most significant agricultural commodities in global trade, serving multiple industries, including edible oil, biodiesel, and cosmetics production. Indonesia maintains its dominant position as the world's largest palm oil producer, accounting for approximately 56% of global production, with an output of 43 million tons during the 2023–2024 period (USDA, 2024). Domestic consumption has demonstrated consistent growth, with notable increases of 24.1% in 2019 (reaching 16,743,000 tons) and 13.8% in 2022 (reaching 20,968,000 tons) (GAPKI, 2023; 2024b; 2025). This sustained demand growth has directly stimulated the expansion of oil palm cultivation areas, with smallholder plantation areas showing consistent annual growth averaging 1.57% between 2018 and 2024.

Riau Province occupies a strategically significant position within Indonesia's oil palm industry, with smallholder plantations covering 2,537,257 hectares in 2023, representing 37.7% of the national smallholder plantation area (BPS, 2025). The province has also identified 100,616 hectares of unproductive plantations that require replanting. The combination of expansion needs and replanting requirements creates a significant addressable market for quality seedling producers.

Oil palm seedlings occupy a critical position in the agricultural value chain as the foundational input that determines plantation productivity for the subsequent 20 to 25 years. Unlike many agricultural commodities, seedlings exhibit credence quality characteristics: buyers cannot reliably assess genetic quality, varietal authenticity, or long-term yield potential at the point of purchase (Siswati et al. 2017). This asymmetric information environment creates serious risks. Counterfeit or substandard seedlings, defined under Ministerial Decree No. 26/Kpts/KB.020/05/2021, include seeds from unregistered producers, uncertified material, and seedlings failing prescribed growth standards, such as minimum frond count, polybag size, or freedom from abnormalities, including crown disease, rolled leaf, and chimera. Certified oil palm seedlings undergo a mandatory quality certification process by the Provincial Plantation Agency (Dinas Perkebunan) upon reaching nine months of age, verifying that each seedling meets national standards before it can legally be sold. The supply chain for certified seedlings begins with licensed seed sources,

primarily the Indonesian Oil Palm Research Center (PPKS), flows through pre-nursery and main nursery stages across multiple growing sites, and concludes with quality-verified stock transferred to farmers, with transportation responsibilities left to buyers due to the absence of a company-managed logistics system (PTPN IV Regional III, 2025).

The strategic importance of VRIO analysis is especially pronounced in the oil palm seedling sector for three interconnected reasons. First, the market is characterized by intense competition from multiple provider types, including state-owned enterprises, private companies, PPKS franchise operators, and community nurseries; however, persistent information asymmetry makes it difficult for buyers to verify quality independently. Second, the consequences of poor seedling choice are irreversible and long-lasting, with the productivity of plants grown from counterfeit seedlings estimated to be only 50% of certified varieties over a 20- to 25-year plantation cycle (Erningpraja, 2002). This makes buyer trust and verifiable quality assurance central competitive variables. Third, despite an estimated addressable market of 177 million for the 2021 to 2024 period in Riau Province alone, the enterprise recorded average sales absorption of only 74.27% of production capacity, signaling that superior resources alone do not automatically translate into market capture. Therefore, understanding which specific resources and capabilities generate sustainable competitive advantage is essential for designing strategies that close the gap between productive capacity and market realization, support the national Oil Palm Smallholder Rejuvenation Program (PSR), and contribute to long-term smallholder welfare improvement (GoRiau, 2024).

A state-owned agribusiness enterprise operating in Riau Province, established in 1996, entered the certified oil palm seedling business in 2021. The company subsequently recorded an average sales absorption of only 74.27% of production targets (2021–2024), highlighting competitive pressure from other seedling providers, including private companies, PPKS franchise operators, and community nurseries. Research by the Indonesian Oil Palm Research Center indicated that 20% of smallholder farmers did not know how to obtain legal seedlings, 12% found the procurement process complex, and 10% were unaware of certified seedling sources. The impact of counterfeit seedlings extends over the long term, with productivity estimated at only 50% compared to certified varieties (Erningpraja, 2002).

The resource-based view (RBV) provides a valuable theoretical lens for understanding the sources of competitive advantage, suggesting that superior performance stems from valuable, rare, inimitable, and organizationally embedded resources and capabilities (Barney, 1991; Wernerfelt, 1984). The VRIO framework operationalizes RBV by systematically evaluating whether each resource meets all four criteria to qualify as a source of sustainable competitive advantage (Barney & Hesterly, 2015). However, the application of RBV frameworks to agricultural input markets in developing economies remains limited (Suhartini et al. 2024; Saloko et al. 2023).

This study addresses these gaps by examining how a state-owned enterprise develops sustainable competitive advantages in the oil palm seedling market. The research objectives are as follows: (1) to identify and categorize internal resources and capabilities across the seedling business value chain; (2) to evaluate these resources using the VRIO framework to determine their contribution to competitive advantage; and (3) to develop strategic recommendations leveraging identified sustainable competitive advantages.

Rather than testing RBV or VRIO propositions, this study contributes by elaborating how the framework operates in a credence quality, information-asymmetric input market, a context in which the consequences of resource misjudgment are irreversible over a twenty-to-twenty-five-year plantation cycle and in which the application of RBV frameworks to agricultural input markets in developing economy contexts remains limited (Suhartini et al. 2024; Saloko et al. 2023). The specific contribution is to show that in such markets, sustainable competitive advantage concentrates in intangible, socially embedded resources whose value depends on buyer trust formation under quality uncertainty, a pattern that extends existing VRIO applications developed primarily in contexts without severe information asymmetry between seller and buyer.

METHODS

This study employed a qualitative single-case study design to enable an in-depth examination of how resources and capabilities generate competitive advantage in an agricultural input market characterized by quality uncertainty and long product evaluation

cycles (Yin, 2018). The case is a state-owned agribusiness enterprise operating in Riau Province, which entered the certified oil palm seedling business in 2021. The research was conducted from February to August 2025, with primary data collection in June 2025. The case was selected purposively because it represents a theoretically relevant setting: a quality-sensitive market where legitimacy, traceability, and organizational routines shape buyer trust and performance outcomes (Barney, 1991; Grant, 2018).

This study prioritizes internal and construct validity over external statistical validity, consistent with methodological guidance for single-case research aimed at theory elaboration rather than theory testing (Eisenhardt, 1989; Gibbert et al. 2008). The case was purposively selected because of its distinctive characteristics, including an intra-holding supply relationship with the national seed research center, multi-site nursery operations, and a documented gap between production capacity and sales absorption, which provide analytical leverage unavailable in a randomly sampled or multi-case design (Siggelkow, 2007). Analytic, rather than statistical, generalization is therefore the intended contribution of this study (Yin, 2018).

The unit of analysis was the seedling business unit and its end-to-end operational process, from material procurement to delivery order issuance. Data were collected from three key internal informants selected through purposive sampling based on their roles in the seedling value chain.

- Informant 1 served as the General Manager of Distrik Petani Mitra for 25 years, responsible for marketing, farmer partnerships, and market outreach.
- Informant 2 served as the Head of the Procurement and Information Technology Division with 25 years of tenure, responsible for material acquisition, website platform management, purchase verification, and delivery order issuance.
- Informant 3 served as the Head of Sub-Division for Investment and Plant Mapping with 12 years of tenure, responsible for nursery operations, pre-nursery and main nursery maintenance, and quality certification.

This structure ensures comprehensive coverage of the seedling business value chain, consistent with the key informant selection logic in case-based research (Miles et al. 2014).

Data collection combined three sources for triangulation: semi-structured in-depth interviews, non-participant observation, and internal document analysis (Flick, 2018). The first instrument (Questionnaire 1 for Resource Identification) presented 15 pre-identified resources and capabilities, to which informants responded Yes/No and could add items; four additional elements were identified by informants, resulting in 19 total items. The second instrument (Questionnaire 2 for VRIO Evaluation) required informants to independently assess each of the 19 items against the four VRIO criteria (V, R, I, O). Field observations were conducted at the Sei Pagar nursery and the Pekanbaru head office. Internal documents reviewed included SOPs, certification records (SP2B-KS), procurement contracts, training schedules, customer repurchase data, and platform workflow documentation.

The VRIO framework evaluates resources and capabilities against four criteria (Barney, 1991; Barney & Hesterly, 2015): Value (V) refers to whether the resource helps exploit opportunities or neutralize threats; Rarity (R) refers to whether it is possessed by few competing firms in the regional market; Inimitability (I) refers to whether replication is difficult due to causal ambiguity, social complexity, path dependence, or large capital requirements; and Organization (O) refers to whether structures and routines enable the firm to capture value from the resource. Resources meeting only V are classified as competitive parity (CP); V+R as temporary competitive advantage (TCA); and V+R+I+O as sustainable competitive advantage (SCA). Resources that meet none qualify as competitive disadvantage (CD).

The VRIO assessment was conducted in two rounds. In Round 1, each informant independently completed the VRIO checklist for all 19 items. Scoring differences emerged for eight elements that were candidates for SCA. In Round 2, a focus group discussion (FGD) was held with all three informants simultaneously for approximately 30 minutes, followed by re-scoring of the eight contested elements. Full consensus was achieved after one FGD session with no remaining scoring differences. This two-round consensus process reduces individual bias and supports interpretive alignment (Miles et al. 2014).

Trustworthiness was strengthened through triangulation across three data sources, the two-round VRIO scoring process with documented decision rules for each

criterion, and member-checking of the final VRIO matrix with informants (Lincoln & Guba, 1985; Flick, 2018).

Construct validity, the extent to which VRIO scores meaningfully reflect the constructs of value, rarity, inimitability, and organization, was further supported by document-based evidence collected independently of informant judgment, including comparative field yield data across three concurrent plantation plots and internal customer repurchase records, both of which are reported in the Results section. Consistent with recommendations for reporting case study rigor (Gibbert et al. 2008), we make explicit that market-level validation from outside the organization, such as competitor or independent customer assessment, was not part of this design. The informant-based scoring reflects organizational members' assessment of internal resources, which is itself the object of the RBV and VRIO inquiry (Barney & Hesterly, 2015), rather than an independent verification of competitive position relative to rival seedling providers.

RESULTS

Identification of Resources and Capabilities

Structured mapping of the oil palm seedling value chain (covering upstream input sourcing, pre-nursery and main nursery operations, quality assurance and certification, marketing and sales, customer administration, and post-purchase interactions) yielded 19 internal resources and capabilities after the two-stage identification process. This process is consistent with the RBV arguments that firm heterogeneity originates from idiosyncratic resource bundles (Wernerfelt, 1984; Barney, 1991). The 19 elements span tangible resources (location, land capacity), intangible resources (reputation, SOPs, website), and organizational capabilities (learning organization, HR capabilities, network management), paralleling resource taxonomies found in prior studies of seedling and plantation businesses in Indonesia (Saloko et al. 2023; Hidayati et al. 2016; Suhartini et al. 2024).

VRIO Summary

The VRIO assessment classified 19 elements into three competitive implications: seven SCAs, six TCAs, and six CP. No element was classified as a competitive

disadvantage (Table 1). The dominance of intangible and organizational resources among the seven SCAs is consistent with the RBV logic that sustained advantage arises from socially complex, path-dependent, and causally ambiguous resources rather than capital-acquirable assets (Barney, 1991; Dierickx & Cool, 1989). This pattern mirrors Suhartini et al. (2024), who found five SCAs in an agribusiness firm all centered on quality systems and organizational capabilities, and Saloko et al. (2023), who found six SCAs in a Kalimantan seedling company similarly dominated by intangible and relational resources. The convergence across three independent cases is notable; however, it does not by itself establish that intangible resources are universally dominant in agribusiness settings, since all three studies share a common limitation of relying on internal informant scoring without external validation; thus, the observed convergence may partly reflect a shared methodological artifact, informants across contexts consistently rating intangible, organizationally controlled resources as harder to imitate, rather than a verified feature of these firms' actual competitive position. What distinguishes the present case from Suhartini et al. (2024) and Saloko et al. (2023) is the

credence quality nature of the seedling product itself, where buyers cannot verify genetic quality before a twenty- to twenty-five-year commitment, which plausibly elevates the strategic weight of trust-related intangibles such as reputation and network management beyond what a non-credence good context would produce.

Strategic Location and Legality: Competitive Parity

Riau Province provides a structurally advantageous market context, with 37.7% of the national smallholder plantation area and 100,616 hectares requiring replanting (BPS, 2025), but location provides value without rarity because all provincial competitors access identical demand conditions. This aligns with Barney's (1991) argument that location-based value is necessary but insufficient when geographic opportunity is broadly shared. Similarly, regulatory compliance through NIB, SP2B-KS, and quality certification processes creates value through legal certainty and consumer protection, but licensing is attainable by any legitimate operator, classifying it as a threshold capability (Barney & Hesterly, 2015; Suhartini et al. 2024).

Table 1. Complete VRIO analysis of resources and capabilities

Resources & Capabilities	V	R	I	O	Result
Strategic location (Riau Province)	√	-	-	√	CP
Legality and business licensing	√	-	-	√	CP
Nursery land capacity (129 Ha)	√	√	-	√	TCA
Technology utilization in maintenance	√	√	√	√	SCA
Superior seedling quality	√	√	√	√	SCA
Standard operating procedures	√	√	√	√	SCA
HR capabilities in maintenance	√	-	-	√	CP
External network management	√	√	√	√	SCA
Material procurement systems	√	-	-	√	CP
Quality certification	√	√	-	√	TCA
Digital marketing capability	√	-	-	√	CP
Conventional marketing	√	√	-	√	TCA
Online ordering website	√	√	√	√	SCA
HR for website management	√	-	-	√	CP
Corporate reputation	√	√	√	√	SCA
Organizational structure	√	√	-	√	TCA
Learning organization capability	√	√	√	√	SCA
Customer loyalty	√	√	-	√	TCA
Pricing strategy and profitability	√	-	-	√	CP

Note: V = Valuable; R = Rare; I = Inimitable; O = Organized; SCA = Sustainable Competitive Advantage; TCA = Temporary Competitive Advantage; CP = Competitive Parity

Nursery Land Capacity (129 Ha, ~1.155 Million Stood): Temporary Competitive Advantage

The company operates five nursery sites (Dumai 43 Ha, Lubuk Dalam 26 Ha, Sei Pagar 13 Ha, Sei Rokan 14 Ha, Tandun 33 Ha), conferring volume and scheduling flexibility advantages over smaller operators. This scale is relatively rare compared to informal operators but remains imitable through land acquisition or leasing by well-capitalized competitors. Maulana and Simamora (2023) confirmed positive relationships between nursery land scale and production capacity in Indonesian agribusiness contexts, but RBV arguments suggest that tangible assets yield only temporary advantages when accumulation is primarily financial rather than socially embedded (Barney, 1991).

Technology Utilization: Sustainable Competitive Advantage

The company integrates three technologies: (1) CCTV surveillance (Portable Sinovision S1 for pre-nursery; G-Lenz Smart Camera PTZ with 1.5-2 hectare coverage for main nursery); (2) water sprinkler irrigation (Rain Bird LF 2400 at 36-49 points/hectare, installation cost ~IDR63 million/hectare, reducing labor by 70% vs. manual irrigation); (3) sprayer drone operations (seven units of multiple types, including DJI Sprayer D16, adopted since 2023). The advantage is not the equipment alone but its integration with trained operators, SOP-guided execution, and real-time managerial monitoring. Drone operation requires certified pilots, a specialized and scarce skill. Capital barriers are substantial. This resource bundle creates causal ambiguity about which components drive performance, supporting the RBV extension that sustainable advantage arises from complementarities rather than isolated assets (Barney, 1991). Leitão et al. (2024) identified technology application as the leading SCA source in agribusiness firms across a systematic literature review. Compared to Saloko et al.'s (2023) Kalimantan seedling company (where technology was also an SCA), the present case is distinguished by multi-technology integration spanning surveillance, irrigation, and pest control, creating a more complex imitation barrier. This classification nonetheless rests on informants' own account of imitation difficulty rather than on evidence that competitors have attempted and failed to replicate the bundle, so the SCA label should be read as an internal judgment of defensibility rather than a demonstrated competitive outcome. It also remains

an open question whether the source of durability is the technology bundle itself or the certified drone pilot capability underlying it, since the two were evaluated jointly here but could, in principle, be separated and imitated at different rates.

Superior Seedling Quality: Sustainable Competitive Advantage

Quality is sustained through systematic culling (7.5% elimination at the pre-nursery stage at 3 months; 12.5% at the main nursery stage at 9 months), stage-specific protocols, and consistent quality assurance routines. Field validation data from a customer with three concurrent 10-hectare plantation plots (same inputs and treatment) demonstrated that the seedlings achieved first harvest at 29 months and produced 10,960 kg FFB in 2025; PPKS franchise seedlings produced 8,427 kg (38 months to first harvest); community seedlings produced 5,269 kg (41 months to first harvest), representing 107.9% higher productivity from this company versus community-sourced seedlings. These results are consistent with Siswati et al. (2017) and Erningpraja (2002), who documented substantial productivity gaps between certified and uncertified oil palm seedlings. In RBV terms, quality is the outcome of an interdependent system comprising seed source governance, SOP compliance, monitoring, and learning that creates isolating mechanisms difficult for competitors to replicate entirely (Barney & Hesterly, 2015; Suhartini et al. 2024).

Standard Operating Procedures: Sustainable Competitive Advantage

SOPs cover all nursery management aspects, including growing media specifications, daily water volume, fertilization dosages, pest control protocols, and culling criteria. What makes these strategic is operational embedding: through training, supervision, formal enforcement, and periodic updates via field research and benchmarking. The isolating mechanism is causal ambiguity and tacit knowledge in execution, specifically how employees interpret and adapt procedures under varying field conditions, rather than secrecy of content. This matches RBV arguments that routines become strategic when firm-specific and socially complex (Barney, 1991). This clarifies why organizational structure alone achieved only TCA: structure can be copied, but SOP-based routines involve deeper tacit components, paralleling Kaya's (2022) argument that

formal structure requires capability-based execution quality to generate competitiveness. An alternative reading, not fully ruled out by the present data, is that SOP compliance and technology use are jointly produced by the same underlying managerial discipline rather than functioning as two independent SCAs, in which case the seven-element count may overstate the number of analytically distinct advantage sources rather than understate the depth of any single one.

HR Capabilities in Maintenance: Competitive Parity

General technical competence, including agriculture/forestry graduate recruitment, pro-hire systems, and long average tenure, is valuable but common across formal nursery operators. However, drone pilot certification (at least one certified pilot per nursery site) is specialized and contributes to technology-based SCA. Human capital becomes strategic only when specialized, socially embedded, and linked to organizational routines (Barney & Hesterly, 2015).

External Network Management: Sustainable Competitive Advantage

The company maintains three certified seed suppliers; its primary supplier, PPKS, is a sister company within the Holding Perkebunan Nusantara group, creating intra-holding access advantages that strengthen supply security. Fertilizers, chemicals, and growing media suppliers are managed through verified contractual arrangements with incoming quality inspection. Value derives from supply reliability and input quality; imitability barriers arise from path dependence and social capital built over nearly 30 years of operations. Chong Tan and Ndubisi (2014) confirmed that relationship quality drives performance in the palm oil industry. Saloko et al. (2023) also classified supplier relationship management as SCA in a seedling context.

Material Procurement Systems: Competitive Parity

Contract-based procurement, supplier verification, and incoming quality checks can be replicated through standard supply chain practices. This motivates the strategic recommendation to upgrade procurement through vertical strategic alliances, converting parity into a more defensible relational capability (Dyer & Singh, 1998).

Quality Certification: Temporary Competitive Advantage

Certification (SP2B-KS and label biru following a six-step UPTD process including laboratory testing and field verification) serves as a credible signal that reduces information asymmetry in a counterfeit-affected market. However, certification is achievable for competent competitors, limiting imitability. This reinforces the argument that regulatory signals differentiate in the short run, but firms must build additional isolating mechanisms, such as reputation, process quality systems, and digital traceability, to maintain defensibility (Barney, 1991).

Digital and Conventional Marketing: Competitive Parity and Temporary Competitive Advantage

Social media presence and media publications create value but are widely accessible (CP). Conventional channels, including airport pamphlets at Sultan Syarif Kasim II (through inter-BUMN arrangement with PT Angkasa Pura), agricultural expos, and radio advertising, provide temporary advantages where competitors underinvest. Internal informants identified farmer-to-farmer word-of-mouth as the most impactful marketing channel, consistent with Ismail et al. (2023) finding that WOM drives purchase decisions in agricultural markets.

Online Ordering Website: Sustainable Competitive Advantage

Since February 2021, the company has operated a dedicated platform developed by its internal IT team, managing registration (KTP and NPWP verification), order submission, dual-method payment verification, and three-level managerial approval for delivery order issuance. As of 2025, no competitor in Riau Province, including other companies holding subsidiaries, operates a comparable digital seedling transaction platform, establishing first-mover rarity. Imitability barriers arise from the need to integrate technology, verification routines, customer support, and distribution governance. Caiazza and Bigliardi (2020) found that agrifood web channels achieve sustainable advantage when integrated into organizational processes and continuously improved. Lacaze et al. (2025) argument that platform advantage becomes defensible through complementary intangibles such as reputation and relationship governance is supported by the co-presence of corporate reputation as a second SCA.

Corporate Reputation: Sustainable Competitive Advantage

As a state-owned enterprise with nearly 30 years of regional presence, the company has built a reputation through CSR programs (student scholarships, disaster relief, school computer donations, and the Bapak Asuh Anak Stunting nutrition program), media communications, and demonstrated seedling performance. Customer data reveal a 51.7% repeat purchase rate across 503 total customers (199 with 2–4 purchases), reflecting reputation-driven trust. State affiliation creates a legitimacy advantage in farmer communities. Castro and Giraldi (2018) confirmed that agribusiness brand resources generate SCA when consistently embedded in stakeholder perceptions. Compared to private competitors in Riau, the BUMN identity positions the company favorably as a national program supporter, creating social complexity that is difficult to replicate.

Learning Organization Capability: Sustainable Competitive Advantage

The company provides at least 12 learning activities annually, including technical training, drone pilot certification, benchmarking visits, and Sekolah Lapang Iklim (field climate school). This capability is rare when consistently implemented, difficult to imitate due to cultural and systemic requirements, and organized through formal programs. Amaya et al. (2024) found that structured learning practices contribute to competitive advantage in emerging market organizations. Leitão et al. (2024) identified learning organizations as one of three dominant SCAs across agribusiness contexts. The present study extends this logic to oil palm seedling markets, where learning routines directly update SOPs and technology adoption decisions.

Organizational Structure and Customer Loyalty: Temporary Competitive Advantage

The formal structure (clear reporting lines across Bagian Tanaman, PTI, and DPM) supports coordination but remains observable and replicable. Customer loyalty (51.7% repeat purchase rate; volume discounts of IDR1,000/seed for orders $\geq 1,000$ seed) is vulnerable to limited switching costs and infrequent purchase cycles. Both achieve TCA but require reinforcement through platform ecosystems and differentiated service bundles to become sustainable (Tahuman, 2016; Setiawan, 2023).

Pricing Strategy and Profitability: Competitive Parity

Market-following pricing (IDR44,000 in 2021–2022; IDR48,000 in 2023; IDR52,000 in 2024) against operational costs of ~IDR30,000/seed provides profitability but does not differentiate between the two. Cost advantages are derived indirectly from technology and SOP efficiency rather than from the pricing strategy itself, consistent with Barney's (1991) argument that pricing rarely functions as an isolating mechanism.

Strategic Recommendations

Six strategic initiatives are proposed based on the seven SCAs, designed to leverage sustainable advantages while strengthening the TCA and CP areas (Table 2).

Strategy 1: R&D Strengthening

The company has already demonstrated an R&D orientation through internal testing before adopting water-sprinkler irrigation. Formalizing this into structured R&D partnerships (with PPKS and IPB University), systematic experimentation in nutrient management and growing media optimization, and documentation of trial results would convert ad hoc innovations into institutional capability. This aligns with Teece (2007) dynamic capability argument that sustained advantage requires resource renewal through sensing, seizing, and reconfiguring processes.

Strategy 2: Enhanced Monitoring and Internal Audit

Multilevel monitoring systems covering pre-nursery to main nursery processes, combined with the extension of the existing Palmco Business Cockpit IoT infrastructure to nursery operations, would maintain organizational embeddedness of the quality and SOP SCAs. Okorie et al. (2023) found that digital technology creates competitive advantage only when integrated with complementary capabilities including HR competence and cross-unit coordination, all of which the company possesses.

Strategy 3: Website Feature Enhancement

Transforming the ordering platform into a customer value platform through consultation services, rating/review mechanisms, educational content, and farmer knowledge-sharing forums leverages existing reputation and network SCAs to build switching

costs and accumulate interaction data for continuous improvement. Caiazza and Bigliardi (2020) found that agrifood web channels achieve sustainable advantage when continuously improved and integrated with organizational trust mechanisms.

Strategy 4: Vertical Strategic Alliances

Converting transactional procurement into relational governance with key input suppliers through joint planning, shared quality audits, and performance-based contract upgrades material procurement from CP to a more defensible relational capability. Dyer and Singh (1998) demonstrated that interfirm relationships function as advantage sources when built on trust and relation-specific investments. The existing intra-holding PPKS relationship provides a model.

Strategy 5: Community-Based Programs

Structured farmer training programs and demonstration plots (providing observable evidence of the 107.9% productivity advantage documented above) reinforce reputation through demonstrated performance

rather than mere communication. Castro and Giralaldi (2018) found that agribusiness brand advantages are strengthened through stakeholder-facing programs that translate brand promises into experienced benefits.

Strategy 6: Learning Organization Optimization

Formalizing mentoring programs, peer coaching, communities of practice, and a knowledge management system would deepen the organizational embeddedness of routines, making the learning organization SCA more difficult to replicate over time. Amaya et al. (2024) found that structured knowledge management practices improve execution reliability and innovation capacity in emerging market firms.

The six strategies form a mutually reinforcing portfolio: R&D generates new protocols; monitoring ensures disciplined execution; website enhancement converts reputation into scalable customer value; vertical alliances stabilize input quality; community programs reinforce legitimacy; and learning organization optimization binds all initiatives into a continuous improvement cycle (Barney, 1991; Teece, 2007).

Table 2. Strategic recommendations based on sustainable competitive advantages

Strategy	SCA Leveraged	Key Initiatives
Continuous Innovation Through R&D	Technology, Learning organization	R&D partnerships with research institutes, systematic experimentation, SOP updates from field trials
Quality Consistency Through Enhanced Monitoring	Superior quality, SOPs, Technology	Multilevel monitoring, IoT-based oversight (extend Palmco Cockpit), operational audits, HR integration
Website Feature Enhancement	Online website, Reputation, Network	Consultation services, rating/review, educational content, cultivation advisories, knowledge forums
Vertical Strategic Alliances	Network management	Long-term partnerships with input suppliers, joint planning, information sharing, collaborative quality improvement
Community-Based Programs for Reputation	Reputation, Network management	Farmer training programs, demonstration plots, collaborative forums, word-of-mouth amplification
Learning Organization Optimization	Learning organization	Formal mentoring, peer coaching, communities of practice, knowledge management systems, leadership development

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study applied the resource-based view and VRIO framework to examine competitive advantage in a state-owned agribusiness enterprise's oil palm seedling business in Riau Province. The value chain-based analysis of 19 resources and capabilities revealed seven sustainable competitive advantages: technology utilization (CCTV, water sprinkler, sprayer drone), superior seedling quality (validated by 107.9% productivity advantage over community-sourced seedlings), standard operating procedures, external network management, online ordering website, corporate reputation (51.7% repeat purchase rate), and learning organization capability. Six resources provided temporary competitive advantage, and six provided competitive parity. The absence of competitive disadvantages indicates a broadly adequate operational foundation.

The dominance of intangible and organizational resources among SCAs is consistent with the RBV arguments that socially complex, path-dependent, and causally ambiguous resources resist imitation more effectively than tangible assets (Dierickx & Cool, 1989; Barney, 1991). This mirrors the findings from comparable agribusiness VRIO studies (Suhartini et al. 2024; Saloko et al. 2023), although the recurrence of intangible dominance across single-case, informant-based studies should be read cautiously given the shared methodological limitation of internal scoring without external validation across all three studies, and extends them to the oil palm seedling context in Riau Province. The present case is further distinguished from both by the severity of information asymmetry facing buyers, a credence quality condition that plausibly explains the elevated strategic weight of trust-related intangibles observed here.

Recommendations

Six strategic recommendations are proposed: (1) institutionalize continuous innovation through R&D strengthening; (2) reinforce quality consistency through enhanced monitoring and potential IoT extension; (3) develop the website into a customer value platform; (4) establish vertical strategic alliances with key input

suppliers; (5) expand community-based programs for reputation reinforcement; and (6) formalize learning organization practices through mentoring, peer coaching, and knowledge management systems.

Theoretical contributions include demonstrating the VRIO application in agricultural input markets with credence quality attributes, where reputation and relational governance play elevated strategic roles (Barney, 1991; Dierickx & Cool, 1989). More specifically, the case suggests that under severe buyer-side information asymmetry, the isolating mechanisms that sustain competitive advantage shift toward trust-producing intangibles, corporate reputation, network management, and organizationally embedded quality routines, rather than toward the technological or locational assets that dominate RBV applications in commodity markets without credence quality features; this proposition is offered as a candidate elaboration of RBV/VRIO theory to be tested in future comparative research, not as an established generalization from a single case. The findings also confirm that state ownership amplifies legitimacy and network-formation advantages while potentially constraining pricing flexibility (Oliver, 1997; Peng, 2002). Limitations include the single-case design, cross-sectional observation, and primary reliance on internal informants. These choices reflect a deliberate trade-off of generalizability for analytical depth (Eisenhardt, 1989), and readers seeking to extend these findings to other organizational contexts should weigh this trade-off accordingly. Future research should incorporate multi-case comparative designs, external validation from customers and competitors, and longitudinal tracking of advantage durability.

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