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From Fragmented Mills to an Integrated Sugar Platform: Consolidation, Operational Turnaround, and Farmer-Centred Value Creation in Indonesia's State-Owned Sugar Industry

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ABSTRACT

This study examines how corporate consolidation can be translated into operational turnaround in state-owned agro-industry, using Indonesia's sugar industry and PT Sinergi Gula Nusantara (SGN) as an illustrative context. SGN is distinctive because 36 sugar mills formerly managed by seven plantation companies were consolidated into a single sugar subholding while the resulting production network remained highly dependent on sugarcane supplied by independent farmers. The study employs a qualitative literature review rather than a systematic literature review, synthesising research published from 2020 onward on post-merger integration, state-owned enterprise governance, operational excellence, working-capital management, agri-food supply-chain integration, contract farming, organisational change, resilience and sugarcane production. The synthesis indicates that structural consolidation alone does not create sustainable value. Turnaround emerges when consolidation is converted into functional integration through governance harmonisation, factory-network coordination, process standardisation, working-capital discipline, farmer-centred supply arrangements, leadership and organisational learning. SGN's early experience illustrates the relevance of these mechanisms: the company assumed management of 36 mills following the 2022 spin-off and reported positive profitability, improved recovery performance and EBITDA above IDR1 trillion in 2023 despite climate-related raw-material pressures. The article develops an integrated consolidation-to-turnaround framework and identifies trade-offs involving centralisation, local autonomy, profitability, liquidity, farmer value capture, efficiency, resilience and public value. The framework offers implications for restructuring state-owned agro-industrial enterprises in emerging economies.

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Introduction

State-owned agro-industrial enterprises occupy a difficult organisational position. They are expected to operate efficiently enough to compete commercially, yet they frequently inherit public-policy obligations, ageing productive assets, historically fragmented organisational structures, heterogeneous labour arrangements, geographically dispersed production units, and relationships with farmers that cannot be governed exclusively through spot-market transactions. These characteristics make restructuring fundamentally different from a conventional corporate merger. The central question is not simply whether assets can be legally consolidated, but whether multiple legacy organisations can be transformed into a coherent operating system capable of coordinating factories, capital, people, raw materials, information, and incentives.

Recent research on state ownership reinforces the importance of this distinction. State ownership does not have a uniform relationship with organisational performance; outcomes depend on

governance arrangements, institutional environments, managerial incentives, ownership structures, and the policy burdens attached to individual enterprises [1,2]. Corporate governance therefore becomes especially important because state-owned enterprises (SOEs) must reconcile commercial accountability with broader public objectives. Research from different institutional settings demonstrates that board design, managerial accountability, ownership arrangements, and the broader meaning of “publicness” influence financial performance and financial reporting quality [3-7].

Indonesia's state-owned sugar industry offers an analytically useful example. PT Sinergi Gula Nusantara (SGN) was established on 17 August 2021 as the sugar commodity subholding within the state plantation group. On 10 October 2022, 36 sugar mills formerly managed by seven PTPN companies-PTPN II, VII, IX, X, XI, XII and XIV-were transferred into SGN through a spin-off arrangement. This was therefore not merely the creation of another corporate entity; it represented the consolidation of historically separate production organisations with different routines, factory conditions, operating cultures, procurement areas and relationships with sugarcane growers (PT Sinergi Gula Nusantara, n.d.).

The year 2023 is particularly important because it was SGN's first full year managing the consolidated mill portfolio. The company's annual report recorded sales of approximately IDR3.776 trillion,

operating profit of about IDR510.53 billion, profit before tax of IDR56.19 billion and profit for the year of IDR57.15 billion, while management separately reported EBITDA of approximately IDR1.1 trillion. Sustainability disclosures indicate that the portfolio comprised 36 sugar mills, of which 32 were operational in 2023, and SGN reported an average sugar recovery rate (rendemen) of 7.19% in that year [8-10]. These figures do not establish that consolidation alone caused the performance improvement, but they provide a sufficiently significant transition to motivate investigation of the mechanisms through which integration could influence performance.

The raw-material side makes the case still more distinctive. SGN has stated that more than 80% of the sugarcane supplied to its factories comes from farmers rather than from estates controlled directly by the company [11]. This means that conventional explanations of corporate turnaround based solely on cost cutting, financial restructuring, factory rationalisation or management centralisation are incomplete. Sugar mills cannot manufacture sugar without an adequate volume of sufficiently fresh, sufficiently high-quality cane delivered at the appropriate point in the milling season. Factory performance is therefore partly determined outside the legal boundary of the firm.

This dependence creates an inter-organisational problem. Farmers decide whether to grow sugarcane, where to deliver it, how intensively to manage their fields and whether to continue their relationships with a particular mill. Mills affect those decisions through pricing mechanisms, revenue-sharing arrangements, transparency, payment reliability, extension services, input support, waiting times, measurement systems and perceived fairness. Research on contract farming consistently shows that contractual architecture matters: contracts may mitigate price risk, relax input and credit constraints, improve productivity and increase household incomes, but outcomes vary according to contract design and local circumstances [12-15].

Indonesian sugarcane research reinforces this point. Technical efficiency differs markedly among sugarcane farms, and production outcomes are influenced by input use, irrigation, training, subsidies, farm characteristics and institutional arrangements [16-18]. Recent work also demonstrates heterogeneity among farmers participating in sugarcane contracting and differences in farmer satisfaction and loyalty within mill partnerships [19,20].

A second analytical issue concerns the distinction between structural consolidation and functional integration. Post-merger integration research shows that placing assets under one ownership structure does not automatically integrate routines, systems, identities and decision processes. Value creation depends on how functions are integrated, how legacy routines are reconciled, how rapidly change occurs, how management controls are introduced and whether trust is preserved during the transition [21-24]. More recent evidence further shows that synergy realisation depends on the degree and type of resource reconfiguration, and that integration capability is conditioned by organisational design and accumulated integration knowledge [25,26].

This distinction is highly relevant to a network of sugar mills inherited from seven organisations. Consolidation may permit common procurement standards, coordinated milling schedules,

regional factory clustering, standardised maintenance procedures, shared financial controls, common performance indicators and centralised strategic purchasing. Yet excessive uniformity can also suppress local knowledge and reduce adaptability. A factory operating in one sugarcane region may face different farmer structures, land conditions, weather risks, transport distances and milling constraints from another factory. Integration therefore requires a balance between corporate standardisation and operational subsidiarity.

A third issue is financial. Turnaround should not be evaluated through reported profit alone. Manufacturing organisations can report accounting earnings while simultaneously absorbing substantial cash in inventories or receivables, whereas inventory accumulation may be intentional when management expects seasonality, sales timing or strategic stock requirements. Recent working-capital research shows that profitability and value depend on the configuration of inventory, receivables, payables and financing rather than on a single universally optimal cash-conversion cycle [27-30]. Evidence from a large manufacturing sample also reinforces the material relationship between working-capital components and financial performance [31].

Accordingly, the SGN narrative provides a starting point rather than proof of causation. The core research problem of this article is: how can structural consolidation be translated into sustainable operational turnaround in a state-owned agro-industrial system that depends heavily on smallholder and independent-farmer supply? The article addresses this problem through six interrelated questions: how consolidation affects organisational coordination; how factory clustering and operational discipline create efficiency; how working-capital and financial management influence turnaround quality; how farmer partnerships affect raw-material security; how leadership and organisational culture influence integration; and under what conditions initial performance improvements can become resilient and sustainable. These questions are treated as mutually connected rather than independent because operational, financial, relational and organisational integration can reinforce or constrain one another.

The contribution is threefold. First, the paper connects post-merger integration scholarship with literature on state-owned enterprise governance. Second, it brings farmer relationships inside the theory of organisational turnaround rather than treating agricultural procurement as an external background variable. Third, it links accounting performance to operating cash, working capital and productive efficiency, producing a more comprehensive interpretation of agro-industrial turnaround.

The transformation sequence informing the remainder of the article is summarised in Figure 1. The figure provides an orienting chronology for the subsequent theoretical analysis and should not be interpreted as evidence of a direct causal effect of consolidation on performance.

Figure 1 should be read as an institutional and operational timeline rather than as a causal claim. It illustrates the transition from dispersed ownership and operating routines toward a common organisational platform, followed by the first full year in which the new structure could begin producing measurable integration effects.

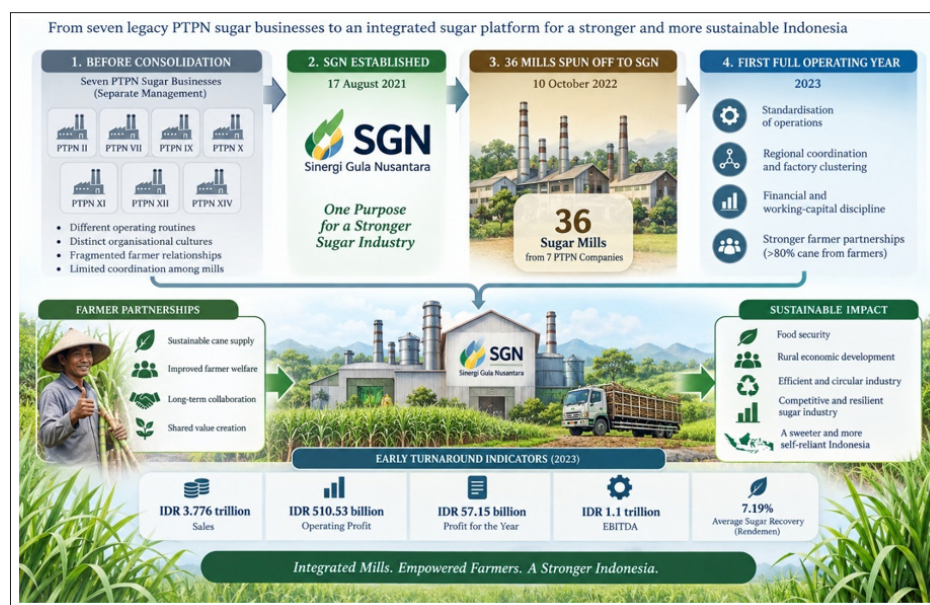


Figure 1: SGN Consolidation and Early Transformation Sequence

Source: Authors' synthesis based on SGN corporate disclosures and reviewed literature. Corporate facts are supported by SGN's company profile, 2023 Annual Report and 2023 Sustainability Report.

Figure 1 highlights the central proposition of the study: the 2022 transfer of factories represents only the structural starting point. What determines the durability of the transformation is what happens between consolidation and outcomes—the operational, financial, relational and organisational mechanisms that constitute functional integration.

Literature Review and Conceptual Foundations

Consolidation and Post-Merger Integration

Post-merger integration research provides an appropriate conceptual starting point because SGN inherited organisations that were legally and administratively distinct before consolidation. Wei and Clegg show that the relationship between integration intensity and acquisition performance operates through specific functional integration strategies, producing either value creation or value leakage. Recent resource-reconfiguration research similarly finds that the appropriate degree of integration depends on the kind of synergy sought, particularly the relative importance of cost and revenue synergies. This is especially relevant for production networks because integration may simultaneously generate economies of scale and create disruption.

Acquisition experience does not automatically translate into capability. demonstrate that acquisition experience must be understood at several organisational levels, while find that deliberate learning mechanisms can be more consequential than simply accumulating acquisition experience. More recent evidence indicates that integration routines evolve through performance feedback and that organisations can refine codified routines by learning from both success and failure [32]. Studies of repeated acquisitions also show that routinisation, codified experience and organisational design shape whether prior experience becomes an effective integration capability [33].

The implication for multi-mill consolidation is important. SGN cannot simply reproduce one factory's practices throughout the network without recognising heterogeneity. Some practices—financial reporting standards, safety rules, procurement controls or core performance indicators—may benefit from tight standardisation. Others—farmer engagement, harvest scheduling or local transport

coordination—may require adaptation. similarly demonstrates that inherited routines may resist merger-driven efficiency efforts when they remain embedded in broader institutional environments.

Integration speed is another strategic variable. find that slower integration may reduce conflict and facilitate trust when organisations are highly dissimilar. In a geographically dispersed agricultural organisation, this suggests that the objective should not necessarily be maximum integration speed. Instead, integration sequencing should reflect task interdependence, institutional differences and the operational risks associated with changing established routines.

Management controls are especially important in converting consolidation into coordinated behaviour. show that employees are more willing to use new controls when those controls are perceived as enabling rather than coercive and when trust is deliberately cultivated. likewise demonstrate that integration controls can shape the relationship among cultural differences, employee resistance and acquisition performance.

Cultural integration also matters. emphasise that organisational cultures are embedded in broader societal settings, while Al Hosani and Jabeen find that justice, commitment, trust, human-resource practices and communication influence employee alienation during post-merger integration. Chen et al. meanwhile, illustrate how integration strategies can coevolve with network reconstruction rather than following a purely linear sequence [34–36].

These findings suggest that successful consolidation requires at least four capabilities: standardisation, adaptation, trust-building and organisational learning. Their relative emphasis should vary across functions because tightly codified activities and locally embedded activities impose different coordination requirements.

State Ownership and the Governance of Turnaround

State-owned enterprises face governance conditions that distinguish them from private-sector mergers. Aguilera et al. show through international evidence that the relationship between state ownership and performance is contingent rather than universal.

Lin similarly argues that performance problems in SOEs cannot be separated from strategic and social-policy burdens.

This matters for SGN because an Indonesian sugar SOE cannot be assessed exclusively through shareholder-value maximisation. It operates within food-security objectives, national sugar-production ambitions and farmer-welfare considerations. These mandates can create value that is not entirely captured in conventional profitability measures, but they can also create ambiguity regarding organisational objectives.

Governance therefore becomes a central mediating mechanism. Guan et al. show that strategic leadership and ownership reform influence SOE performance, while Abang'a et al. demonstrate that dimensions of board governance are associated with aspects of SOE financial performance. Indonesian research by Umanto et al. underscores the relevance of board composition and two-tier governance structures, and evidence from another developing-economy setting similarly links SOE governance arrangements with performance outcomes. These findings reinforce the need to analyse consolidation together with accountability structures rather than as an operational redesign alone [37].

Financial accountability is especially important. Ruggiero et al. show that the publicness of SOEs introduces distinctive pressures into financial reporting and accountability. Thus, performance evaluation should distinguish management narrative, accounting results, cash generation and operational indicators rather than relying on a single headline number.

Institutional context also matters. Poppelwell and Overton show that governance practices need to be adapted to cultural and organisational circumstances rather than transplanted mechanically. Cao et al. studying innovation efficiency under different degrees of state ownership, likewise demonstrate that performance consequences depend on ownership configuration and organisational constraints.

The implication is that SGN's consolidation should be conceptualised as governed integration: a restructuring process in which commercial disciplines must coexist with public-value obligations. This framing places accountability, transparency and explicit decision rights alongside operational synergy as core elements of the turnaround architecture.

Operational Excellence and Factory-Network Coordination

The economic justification for consolidating multiple factories partly rests on the potential to coordinate operations more effectively. Operational excellence, however, requires much more than issuing common instructions. A meta-analysis by Antony et al. identifies employee participation, training, management commitment, resources, leadership, communication, organisational culture, supplier relationships, performance management and teamwork as important conditions for manufacturing operational-excellence programmes [38].

In sugar manufacturing, coordination has an unusual temporal dimension because cane deteriorates after harvest and must be processed rapidly. Factory utilisation therefore depends not merely on installed crushing capacity, but on the alignment among harvesting, transport, queue management, milling reliability and geographical cane availability. A mill with substantial nominal capacity may perform poorly if it lacks sufficient cane or if breakdowns extend waiting times and reduce sucrose recovery.

Indonesian evidence demonstrates that upstream technical efficiency is heterogeneous. Yusuf et al. document variation in the efficiency of state-owned sugarcane production in East Java, while Rosidah et al. examine production efficiency among partner farmers supplying PTPN X. Santosa et al. find that training, irrigation access and subsidies are among the factors associated with technical efficiency in East Java sugarcane farming.

These results suggest that factory regionalisation can create value through several channels. First, neighbouring mills can coordinate milling calendars to reduce destructive competition for cane. Second, technical and maintenance capabilities can be shared across factories. Third, benchmarking can expose persistent performance gaps. Fourth, procurement and spare-parts strategies can exploit scale. Fifth, the network can direct capital expenditure toward constraints with the highest system-wide returns rather than allocating investment according to legacy organisational boundaries.

Yet centralisation also introduces risk. Excessive central control may reduce plant managers' ability to respond to local agricultural conditions. The optimum system therefore combines central standards with decentralised execution.

Working Capital, Inventory and the Quality of Turnaround

Working-capital management is critical in seasonal processing industries. Sugar production creates a temporal mismatch between procurement, production, inventory holding and sales. Consequently, a profitable income statement may coexist with substantial cash absorption.

Lyngstadaas demonstrates that effective working-capital management should be understood as a configuration or system rather than as independent optimisation of individual balance-sheet accounts. Amponsah-Kwatiah and Asiamah similarly show significant relationships between working-capital components and manufacturing profitability. Evidence from Latin America suggests that the relationship may be nonlinear and dependent on firm, industry and macroeconomic conditions.

Financial constraints further alter optimal working-capital strategies. Jabbouri et al. find that constrained firms may pursue more aggressive working-capital policies, whereas firms with greater financing capacity can hold more working capital to support sales. Aldubhani et al. report evidence linking shorter collection periods and cash-conversion cycles to profitability, while Indonesian evidence also associates working-capital components with manufacturing profitability [39].

Cross-country research by Baños-Caballero et al. further demonstrates that the value of net operating working capital depends on institutional and financial conditions. Recent manufacturing evidence likewise shows that cash-conversion and other working-capital measures can materially affect profitability and financial performance, strengthening the case for context-specific rather than mechanically minimal working capital [40].

For SGN, the implication is straightforward but important: profit, EBITDA, inventory and operating cash flow should not be conflated. They represent different dimensions of performance. A credible turnaround therefore requires a dashboard that combines operating margin, EBITDA, net profit, cash from operations, inventory days, receivable days, payable days, debt service and seasonal liquidity.

Farmer-Centred Supply-Chain Integration

SGN's dependence on farmer cane means that its organisational boundary is economically porous. Supply-chain integration research shows that internal integration and external collaboration can enhance risk management and operational performance [41]. In agro-food processing specifically, internal and supplier integration can improve product quality and financial performance, while trust and commitment can mediate broader integration-performance relationships [42-44].

The contract-farming literature provides a useful theoretical foundation. Ruml and Qaim distinguish simple marketing contracts from resource-providing arrangements and find stronger productivity effects when processors help address input and financing constraints. Arouna et al. however, demonstrate that relatively simple arrangements can also generate significant productivity and welfare improvements where price risk is a major constraint. These apparently different findings reinforce a common conclusion: contract design must respond to the market failure actually faced by farmers.

Contracts also redistribute risk. Bellemare et al. show that contract farming can function as partial insurance through reduced income variability. Ruml et al. demonstrate that different contract designs are associated with different livelihood strategies, while report positive welfare or income effects in different commodity and country contexts [45-47].

At the same time, resilience research warns against equating efficiency with robustness. Hobbs shows that food supply chains benefit from scale in normal conditions but require flexibility and adaptability under disruption. Cross-country evidence on agri-food supply chains likewise identifies collaboration, redundancy, flexibility, leadership and innovation as capabilities that operate across preparedness, response, recovery and adaptation phases [48,49]. This is highly relevant to sugarcane because drought, rainfall anomalies, labour constraints, transport disruption and mill breakdowns can alter supply conditions rapidly.

For Indonesian sugar mills, farmer loyalty is strategically important. Hakim et al. document heterogeneity among Indonesian sugarcane farmers participating in contract arrangements. Umaiya et al. show that satisfaction and loyalty vary between generations of farmers supplying PTPN XI mills. Farmer relationships should therefore be treated as strategic assets whose maintenance influences factory capacity utilisation.

Organisational Change, Leadership and Resilience

Consolidation also requires behavioural integration. Albrecht et al. show that organisational resources such as leadership support, a supportive change climate and clear goals influence employee change engagement through job-level resources. Albrecht et al. further demonstrate the importance of meaningfulness, psychological safety and self-efficacy in building active employee engagement with organisational change [50,51].

This evidence is especially relevant when employees have inherited strong identities associated with former companies or individual factories. Integration cannot rely solely on structural reporting lines. Employees must gradually replace legacy "us and them" boundaries with a new organisational identity without destroying valuable local knowledge.

Dynamic-capabilities research offers a complementary explanation. Colombo et al. show that reconfiguration capabilities become

especially valuable after environmental shocks associate sensing and reconfiguration capabilities with manufacturing resilience. emphasise continuous learning and knowledge exchange in resilient organisations, and a multilevel process perspective further shows that resilience depends on adaptive mechanisms spanning individual, organisational, ecosystem and institutional levels [52,53].

The theoretical implication is that turnaround is not a one-time achievement. Sustainable consolidation creates an organisation capable of repeatedly sensing problems, reallocating resources, modifying routines and learning from performance outcomes.

Method

This study adopts a qualitative literature review, sometimes described as an integrative or narrative thematic review. It is explicitly not a systematic literature review and does not claim PRISMA-style exhaustiveness. The purpose is theoretical synthesis: to bring together bodies of scholarship that are normally analysed separately and use them to explain how consolidation could generate turnaround in a farmer-dependent state-owned agro-industrial enterprise.

Literature was purposively identified around six conceptual domains: post-merger integration and organisational consolidation; governance of state-owned enterprises; operational excellence and manufacturing coordination; working-capital and financial management; agri-food supply-chain integration and contract farming; and organisational change, resilience and sugarcane production. Priority was given to peer-reviewed literature published from 2020 onward and to studies with direct relevance to manufacturing, emerging economies, state ownership, agriculture or organisational integration.

The selection logic was therefore conceptually driven rather than statistically exhaustive. Literature discovery prioritised peer-reviewed journals indexed in major scholarly databases, including Scopus- and Web of Science-indexed outlets, and was supplemented by publisher platforms for targeted retrieval and verification. Seminal recent articles were first identified within each domain and then complemented with empirical studies capable of illuminating specific mechanisms such as trust, contract design, employee engagement, inventory management or technical efficiency. Search combinations included post-merger integration, corporate consolidation, state-owned enterprise, operational excellence, working capital, cash conversion, supply-chain integration, contract farming, farmer partnership, sugarcane efficiency, organisational resilience and change engagement. Because the purpose was interpretive synthesis rather than exhaustive enumeration, the review did not apply PRISMA screening counts or meta-analytic inclusion procedures.

Evidence was interpreted through thematic coding. Initial codes described mechanisms—for example, "standardisation", "integration controls", "cash discipline", "farmer trust", "technical support", "culture", "leadership" and "resilience". These were then clustered into four higher-order integration dimensions: operational integration, financial integration, relational integration, and organisational integration. Outcomes were classified separately into profitability, cash generation, capacity utilisation, supply reliability, technical efficiency, farmer welfare, employee alignment and resilience.

SGN was used as an illustrative context rather than as an empirical case study based on interviews or primary observation. Corporate

facts were triangulated using the company's official profile, annual reporting, sustainability reporting and public corporate disclosures. Particular care was taken to distinguish independently documented accounting measures from managerial narratives. For example, 2023 profit for the year is treated separately from EBITDA, and neither is treated as equivalent to operating cash flow. The method therefore avoids converting promotional corporate statements into causal evidence.

The synthesis follows an explanation-building logic. Evidence from multiple literatures is used to identify mechanisms capable of connecting consolidation with performance and to specify the boundary conditions under which those mechanisms may weaken or reverse.

Results: Thematic Findings

Theme 1 - Consolidation Creates Optionality, not Automatic Synergy

The first thematic finding is that structural consolidation creates the possibility of value creation but does not itself constitute value creation. In the SGN context, bringing 36 mills under one corporate umbrella potentially eliminates duplicated governance structures, permits common performance metrics and creates a platform for coordinated capital allocation. However, post-merger literature consistently demonstrates that realised performance depends on subsequent functional integration and on whether the integration design matches the intended synergy and organisational context.

This distinction explains why the unit of analysis should move from the legal company to the operating routine. A procurement policy, maintenance procedure, cane scheduling process, human-resource rule or reporting system may remain functionally fragmented even after the mills legally belong to one enterprise. Conversely, factories can retain considerable local autonomy while still being effectively integrated if they share strategic objectives, data architectures, governance principles and performance standards.

SGN's consolidation is therefore best interpreted as removal of a coordination constraint. Under separate PTPN ownership, neighbouring mills could theoretically compete for farmers, apply different purchasing practices or optimise performance within former corporate boundaries. A consolidated platform permits the system to ask a different question: what configuration maximises the value of the complete sugar network?

Figure 2 synthesises this causal argument. It visually separates structural consolidation from the operational, financial, organisational and relational integration mechanisms through which consolidation can influence intermediate and final outcomes.

Figure 2 presents the central conceptual contribution of this review. It distinguishes structural consolidation from the mechanisms that translate consolidation into measurable outcomes and explicitly incorporates the contextual conditions that can weaken those mechanisms.

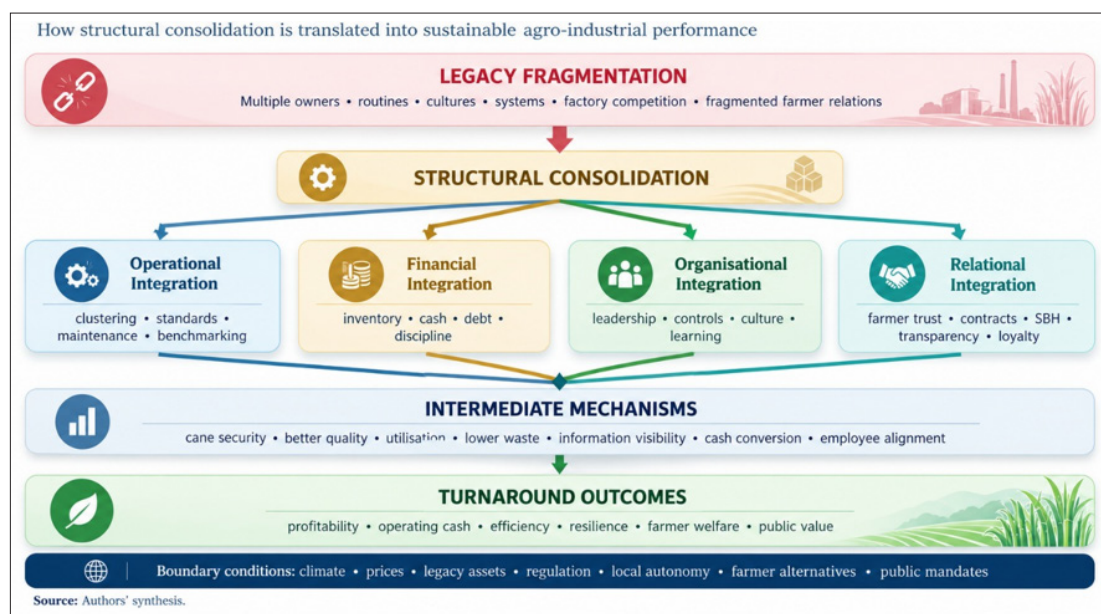


Figure 2: Integrated Consolidation-to-Turnaround Framework

Source: Authors' synthesis.

The framework rejects a single-factor explanation of turnaround. Operational integration without farmer integration can leave factories without cane. Farmer integration without financial discipline can generate procurement growth that strains liquidity. Financial centralisation without employee engagement can create resistance. The mechanisms are therefore complementary rather than substitutable.

Theme 2 - Regionalisation can Transform Internal Competition into Network Optimisation

A second theme concerns factory clustering and regional coordination. Cane is unusual because transportation time, harvest timing and freshness materially influence sugar recovery. When mills compete for overlapping cane catchments, factory-level optimisation can generate system-level inefficiency.

Consolidation makes it possible to redefine the relevant optimisation unit. Instead of each factory maximising its own cane intake regardless of network consequences, regional management can coordinate opening dates, crushing schedules and farmer allocation. It can also identify mills whose marginal processing efficiency does not justify drawing cane away from technically stronger mills.

This interpretation is consistent with operational-excellence research, which emphasises system-level management, leadership commitment, common performance systems and supplier relationships. It is also consistent with Indonesian research demonstrating substantial variation in sugarcane technical efficiency.

Regionalisation creates several possible efficiency channels. Maintenance teams and technical experts can support multiple mills instead of remaining trapped within legacy organisational structures. Spare-parts inventories can be rationalised. Purchasing contracts can exploit larger volumes. Engineering performance can be benchmarked. Investment decisions can prioritise bottlenecks with the highest regional return.

However, network optimisation should not be confused with indiscriminate factory closure. Capacity redundancy may provide resilience when a mill suffers an unexpected breakdown or extreme weather affects one production zone. Hobbs demonstrates more generally that systems optimised exclusively for efficiency may be less resilient under disruption. The strategic problem is therefore to distinguish genuinely inefficient redundancy from valuable flexibility.

Theme 3 - Operational Turnaround Depends on Cane Quality as Well as Factory Efficiency

A third theme is the interdependence of agricultural and industrial efficiency. Sugar recovery is produced jointly by field conditions and factory operations. Even a technologically efficient mill cannot extract sucrose that is absent from the harvested cane, while high-quality cane can lose value through harvest-to-crush delays or poor factory recovery.

The SGN experience is relevant because the company reported an average recovery rate of 7.19% in 2023 despite lower cane availability associated with El Niño conditions. Management linked the increase in recovery to operational performance improvements, although the disclosure should be interpreted as management reporting rather than independent causal evaluation. This distinction is important because the literature review can identify plausible mechanisms but cannot attribute observed performance changes to any single intervention.

The literature suggests that cane productivity and efficiency are affected by irrigation, training, agronomic practices, subsidies and farmer characteristics. Partner-farmer research similarly indicates room for significant improvement in resource-use efficiency.

This produces an important conceptual result: agricultural extension should be classified as part of mill operations rather than only as corporate social responsibility. If farmer agronomic support increases yield, sugar content, supply reliability or harvest coordination, then investment in farmer productivity effectively increases utilisation of factory capital.

Theme 4 - Farmer Partnerships Are a Form of Productive Infrastructure

Because more than 80% of SGN's raw-material supply is reported to originate from farmers, farmer relationships are comparable to productive infrastructure. A mill may own boilers, milling trains and clarification systems, but the economic value of those assets collapses when cane supply is inadequate. This dependence makes relational governance a direct determinant of asset utilisation rather than a peripheral stakeholder-management issue.

Contract-farming evidence shows that relationships between processors and farmers can solve several market failures simultaneously. Resource-providing contracts may facilitate access to credit, inputs and technical services. Fixed-price or other contractual arrangements can reduce farmer exposure to price volatility. Contract participation can also increase income under certain institutional settings, although effects are heterogeneous and should not be assumed to generalise automatically.

For SGN, the relevant institutional mechanism is broader than formal contract farming. The Sistem Bagi Hasil or revenue-sharing relationship potentially aligns incentives by connecting farmer returns with sugar output or value. Its success, however, depends on perceived measurement accuracy, transparent weighing and quality assessment, understandable formulas, predictable payment and confidence that the mill is not using informational advantage against growers.

Farmer loyalty matters because competition for cane does not disappear merely because state-owned mills consolidate. Private mills or alternative crops can still compete for farmers' land and output. Hakim et al. show substantial heterogeneity among Indonesian sugarcane farmers, while Umaiya et al. identify different satisfaction and loyalty levels between farmer groups. A uniform partnership design may therefore be insufficient.

Figure 3 illustrates this reinforcing relationship. The loop emphasises that transparent partnership arrangements and agronomic support can affect trust, supply commitment, utilisation, recovery and joint value creation, while a negative loop can emerge when opaque measurement or weak service erodes farmer confidence.

The farmer-mill relationship should be understood as a feedback system. Stronger partnerships are valuable not simply because they increase farmer satisfaction but because they can influence physical supply, quality, mill utilisation and the resources available for further partnership investment.

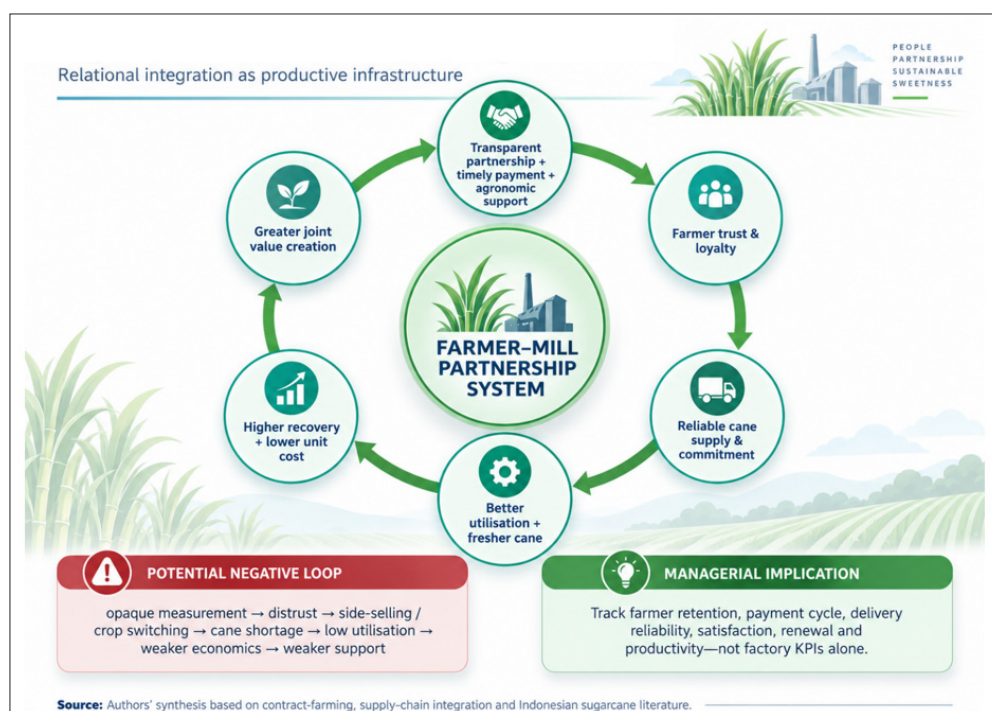


Figure 3: Farmer-Mill Reinforcing Value Loop

Source: Authors' synthesis based on contract-farming, supply-chain integration and Indonesian sugarcane literature.

The practical implication is that relationship quality should become measurable. A consolidated sugar company needs not only factory KPIs but also farmer-retention rates, payment-cycle indicators, complaint resolution, cane-delivery reliability, satisfaction, renewal rates and productivity trajectories.

Theme 5 - Working-capital Discipline Determines Whether Operational Gains Become Financially Sustainable

Turnaround narratives frequently emphasise profit because it is intuitive and visible. Yet profitability represents only one layer of financial performance. The distinction becomes particularly important in seasonal industries holding substantial inventory.

Suppose a sugar manufacturer produces inventory during the milling season but deliberately delays sale. Accounting profit may depend on sales recognition and product costing, while cash remains tied up in stock. Inventory can therefore preserve future margin opportunities but simultaneously require financing. If inventory is financed by short-term debt, additional interest expense can erode the eventual benefit. The correct question is not whether inventory is high or low, but whether the expected incremental value of holding inventory exceeds its financing, storage, quality and liquidity costs.

Working-capital literature supports such a contingent interpretation. Lyngstadaas shows that successful working-capital practices operate as interdependent configurations, while Gallegos Mardones finds nonlinear relationships between working capital and performance. Jabbouri et al. demonstrate that financing constraints alter the relationship still further, and recent manufacturing evidence confirms that cash-conversion, inventory and payment-cycle choices can materially influence financial performance.

The SGN narrative supplied as the starting material contains references to deliberately limiting reported profit through inventory decisions and to a large operating-cash-flow figure. Such claims are analytically interesting but should not be accepted literally without reconciliation to audited definitions. The verified 2023 annual-report evidence supports profit for the year of approximately IDR57.15 billion and operating profit of approximately IDR510.53 billion, while management additionally disclosed EBITDA of around IDR1.1 trillion. These metrics measure different economic quantities and should therefore be interpreted separately.

Figure 4 provides the accounting bridge necessary to avoid conflation. It shows how revenue and accounting earnings connect to working-capital movements and operating cash flow before capital expenditure and financing decisions determine sustainable financial capacity.

Figure 4 separates earnings from cash conversion. It is particularly important for interpreting turnaround claims because an increase in inventory can simultaneously support future sales and absorb operating cash.



Figure 4: From Operational Performance to Cash-Based Turnaround
Source: Authors' synthesis.

A robust turnaround dashboard should therefore include at least operating profit, EBITDA, net profit, operating cash flow, inventory days, receivable days, payable days, debt levels, interest coverage and capital expenditure. A company can improve one measure at the cost of another; management quality lies partly in balancing them.

Theme 6 - Human Integration is an Operating Capability

The consolidation of seven organisational lineages creates a behavioural challenge. Employees historically socialised within different PTPN organisations may retain separate practices and identities long after legal consolidation.

Post-merger evidence shows that cultural differences can generate resistance and reduce performance [54]. Trust-building, communication and perceived fairness become especially important when new control systems are introduced.

The literature on change engagement strengthens this conclusion. Albrecht et al. demonstrate that leadership, change climate and job resources influence employees' willingness to engage actively with change. Albrecht et al. show that psychological safety, meaningfulness and self-efficacy predict change engagement.

This has a direct managerial implication. "Teamwork" and management acting as a "role model", highlighted in the initial SGN narrative, should not be dismissed as soft variables. In a post-consolidation organisation they affect the willingness to share knowledge across plants, disclose problems, accept benchmarking, adopt common standards and cooperate with central functions. These behavioural processes can ultimately influence physical production performance.

Leadership role modelling is particularly important because employees observe whether senior management itself complies with the standards imposed on lower organisational levels. If leaders request cost discipline while enjoying obvious exceptions, or demand transparency while suppressing bad news, formal integration can coexist with behavioural fragmentation. Conversely, visible consistency can accelerate identity formation.

Theme 7 - Turnaround must Incorporate Resilience

Operational consolidation creates economies of scale, but concentration can also create common-mode risks. A centralised procurement system can achieve lower prices yet expose many mills to the same supplier disruption. Highly optimised inventories can release cash but reduce spare-part availability during breakdowns. Centralised decision-making can improve consistency but slow response to local shocks.

Resilience scholarship therefore complements efficiency analysis. Hobbs highlights the trade-off between normal-time economies of scale and flexibility under abnormal conditions, while Zhao et al. show that collaboration, redundancy, flexibility, leadership and innovation can support different phases of agri-food supply-chain resilience. Dynamic-capability research similarly suggests that successful organisations need the ability to sense environmental changes and reconfigure resources rather than merely optimise existing routines.

Climate volatility makes this particularly important for sugar. El Niño-related production pressures reported by SGN in 2023 demonstrate that corporate restructuring does not eliminate agricultural risk. Irrigation, diversified cane areas, harvest flexibility, farmer support, adaptive milling schedules and liquidity buffers all contribute to resilience.

Resilience therefore changes the definition of operational excellence. The most efficient network under average conditions may not be the system that maximises long-term value under uncertainty.

Theme 8 - Sugar Mills can Evolve Toward Circular Bio-Industrial Platforms

The final thematic finding expands the long-term strategic horizon. Conventional sugar-mill performance is usually evaluated through sugar recovery, throughput, cost and molasses revenue. Yet contemporary sugarcane research increasingly treats the mill as a potential biorefinery capable of producing energy and higher-value products from bagasse, molasses, filter cake and other biomass streams.

Bridhikitti et al. demonstrate how mill and distillery by-products can be reintegrated into agricultural production, potentially reducing waste while supporting soil fertility and resource circularity. Vandenberghe et al. describe a broader transition from conventional sugar and ethanol production toward integrated sugarcane biorefineries and higher-value bioproducts. Recent reviews further identify substantial potential for bagasse-based electricity, second-generation ethanol, biogas and other value-added pathways, while also emphasising the technical and economic barriers that must be addressed for circular biorefinery systems to scale.

Consolidation may improve the economics of this transition because research, engineering, investment and market development can be shared across a larger factory network. Not every mill needs to produce every product. Regional specialisation could permit one cluster to emphasise cogeneration, another biofertiliser, another specialised fermentation products and another conventional sugar, depending on feedstock, infrastructure and local markets.

This illustrates why successful consolidation can create strategic value beyond immediate cost reduction. Once fragmented mills share data, capital allocation and innovation capability, the organisation can begin optimising a portfolio of biological resources rather than managing factories as isolated sugar producers.

Discussion and Analysis

Answering RQ1: How does Consolidation Create Value?

The synthesis suggests that consolidation generates value by removing barriers to system-level optimisation. It can reduce duplicated administration, harmonise governance, increase procurement leverage, establish common performance standards and make cross-factory resource allocation possible. Yet these benefits exist initially as options rather than realised synergies.

The post-merger literature provides an important warning: increasing the level of integration does not mechanically increase performance. Functional strategies determine whether integration creates value or causes leakage. Routine incompatibility, cultural conflict and poorly designed controls can neutralise structural benefits.

Consequently, SGN's transformation should not be judged only by the successful legal transfer of mills. The relevant test is whether formerly fragmented operations increasingly behave as a coordinated production network while retaining necessary local responsiveness.

The emerging answer to RQ1 is therefore that consolidation is an enabling condition, while integration capability is the value-creating capability. This interpretation is consistent with recent evidence that resource reconfiguration and organisational design determine whether integration intensity translates into realised synergy.

Answering RQ2: Through What Operational Mechanisms Can Consolidation Improve Performance?

The literature identifies five closely related operational mechanisms. First, process standardisation reduces unjustified variation by allowing factories to share maintenance standards, reliability metrics, procurement rules and operating procedures. Second, benchmarking makes performance gaps visible, enabling management to distinguish structural disadvantages from managerial underperformance. Third, regional coordination can

reduce competition among mills for the same cane and improve alignment between cane availability and crushing capacity.

Fourth, shared expertise allows scarce engineering and operational capabilities to circulate across factories, reducing dependence on plant-specific knowledge silos. Fifth, portfolio capital allocation replaces legacy allocation, allowing investment to be directed toward projects that offer the highest system-wide value rather than preserving historical distribution patterns.

These mechanisms correspond closely to the conditions identified in operational-excellence research. Their importance is magnified in sugar production because agricultural and factory operations are tightly interdependent.

However, the analysis also suggests a principle of selective standardisation. Corporate control should be strongest where uniformity creates substantial value-financial reporting, ethics, safety, investment appraisal and core operational measurement. Local discretion should remain greater where knowledge is geographically specific-farmer engagement, harvest coordination and responses to local weather.

Answering RQ3: Why is Working Capital Central to Turnaround Quality?

A turnaround can fail despite improving margins if it runs out of liquidity. This is especially plausible in seasonal industries where inventory accumulates rapidly.

The literature shows that no single working-capital ratio should be minimised mechanically. Very low inventory may reduce financing requirements but undermine service levels. Aggressive payables management may improve short-term cash yet damage farmer or supplier trust. Extending receivable periods may support customers but weaken liquidity. Working-capital management therefore involves finding a configuration consistent with the firm's operational model.

For an enterprise such as SGN, four distinctions are essential. EBITDA is not cash flow because it excludes important cash effects such as working-capital changes, taxes and interest, while accounting profit is not cash flow because accrual recognition differs from cash timing. Inventory is neither automatically good nor bad: strategic stock may increase later selling flexibility, but excess inventory can create financing and market-price risk. Finally, debt reduction is not automatically optimal because debt becomes problematic when financing cost and refinancing risk exceed the productive returns generated by the financed capital.

This implies that the credibility of a state-owned-enterprise turnaround should increase when financial reporting publicly reconciles operating results with working-capital changes and cash generation. Such transparency is consistent with the SOE accountability concerns raised by Ruggiero et al.

Answering RQ4: How do Farmer Relationships Influence Turnaround?

The review strongly indicates that farmer relationships should be treated as part of the production function. This is consistent with evidence that supplier integration can affect product quality and financial performance in agro-food processing and that trust and commitment are important enablers of supply-chain integration.

When a mill provides transparent purchasing arrangements, credible measurement, predictable payment and agronomic

support, it can increase farmer willingness to remain in sugarcane and deliver to that mill. Resource-providing contracts may additionally relax financing and input constraints. Stable pricing arrangements can reduce farmer risk.

The positive causal sequence can be summarised as relationship quality leading to farmer commitment, which supports cane quantity and quality, improves factory utilisation and unit processing economics, and ultimately strengthens joint value creation. The sequence is not deterministic, but it clarifies why relational governance can influence physical and financial outcomes in a farmer-dependent processing system.

The relationship can also operate negatively. Delayed payment, opaque quality measurement or unreliable services can reduce trust. Farmers may shift to other buyers or other crops. Lower cane availability then reduces factory utilisation, which weakens financial performance and potentially reduces the company's capacity to support farmers. A self-reinforcing deterioration cycle can emerge.

SGN's dependence on farmer cane makes this mechanism particularly important. The firm cannot create durable industrial efficiency while farmer economics deteriorate. Its turnaround strategy must therefore satisfy a joint-surplus condition: productivity improvement should create sufficient value to strengthen both mill performance and farmer returns.

Answering RQ5: Why do Leadership and Culture Matter?

Leadership matters because integration involves uncertainty. Employees must decide whether central management is competent, whether new controls are fair, whether local expertise will be respected and whether cooperation across former organisational boundaries is safe.

The literature shows that change engagement is influenced by leadership support, clarity, psychological safety and self-efficacy. Post-merger research similarly demonstrates that trust affects acceptance of controls.

This provides a deeper interpretation of the "one kitchen, one purpose" metaphor embedded in the starting material. Seven organisations cannot literally be transformed into one organisation merely by changing ownership. They become one operating organisation when employees increasingly use common routines, share information, trust common governance mechanisms and evaluate success at the consolidated rather than legacy-unit level.

Role-modelling by directors becomes important because organisational culture is partly inferred from observed behaviour. A leadership team that visits mills, discusses operational problems openly, applies the same standards to itself and recognises cross-unit cooperation can reinforce the new identity more effectively than slogans alone.

Answering RQ6: Under What Conditions Can Early Gains Become Durable?

The literature suggests five conditions for making early gains durable. First, institutionalisation is required so that improvements become routines, systems and capabilities rather than remaining dependent on a few individuals; performance feedback is particularly important for refining integration routines over time. Second, the organisation needs a learning capability that distinguishes practices worth standardising from those that require local variation, consistent with research on codified experience

and integration capability development.

Third, financial resilience requires working-capital and debt structures that support rather than destabilise operations. Fourth, farmer sustainability is necessary because a factory network cannot remain successful if its agricultural supply base becomes economically unattractive. Fifth, adaptive capability is required because climate shocks, price volatility, technology and policy continue to change; dynamic capabilities therefore remain important after the apparent turnaround has been achieved.

Early profitability is thus better understood as evidence that a transformation may be working than as proof that transformation has been completed. Durability depends on whether the organisation can reproduce those gains across seasons, shocks and leadership transitions.

Centralisation Versus Autonomy

One of the most significant theoretical implications concerns centralisation. The relevant design problem is not whether authority should be centralised or decentralised in absolute terms, but which decisions benefit from common rules and which require local knowledge.

Traditional merger logic often treats integration as movement toward greater central control. The present synthesis suggests a more nuanced model. Centralisation is beneficial when activities exhibit economies of scale, require common standards or generate substantial interdependencies. Examples include financing, strategic procurement, financial reporting, enterprise data architecture and capital-allocation criteria.

Decentralisation remains valuable where information is tacit, local and time sensitive. Farmer relationship management, field-level agronomic decisions and immediate factory troubleshooting frequently fall into this category.

The relevant objective is therefore not maximal centralisation but minimum necessary centralisation combined with maximum useful coordination. This balance is consistent with evidence that organisational design conditions how tacit and explicit knowledge are converted into integration capability.

This distinction can help explain why some large state-owned consolidations underperform. Corporate headquarters may successfully concentrate authority without creating superior information, incentives or operating capability. What appears organisationally integrated may remain economically fragmented.

Efficiency Versus Resilience

A second trade-off concerns efficiency and resilience. Efficiency-oriented consolidation can lower average costs, but excessive concentration or elimination of all slack can increase vulnerability to disruptions.

Factory clustering, inventory reduction and procurement consolidation may improve average costs. Yet eliminating all redundancy can increase vulnerability. One spare part stored regionally may be financially more efficient than identical inventories at every mill, but a completely centralised stock can become a single point of failure if transport is disrupted.

Similarly, closing lower-efficiency factories can improve average performance but reduce network flexibility during exceptionally strong harvests or outages at larger mills. The resilience literature

therefore suggests distinguishing wasteful redundancy, which adds cost without meaningful protection, from strategic redundancy, which functions as an option under uncertainty. Performance systems should recognise this distinction rather than penalising all unused capacity indiscriminately.

Profitability versus public value

A third trade-off derives from SGN's state-owned character. Commercial discipline must coexist with explicit public-value objectives, making performance evaluation inherently multidimensional.

Commercial turnaround is important because persistent losses eventually undermine the ability to maintain assets and support farmers. However, maximising short-term profit may not maximise public value: investments in farmer extension, varietal renewal, irrigation support or training can reduce near-term earnings while increasing long-term sugar production and farmer income. A factory could likewise improve its own financial ratios by reducing services to difficult farmer regions even when doing so conflicts with broader food-security objectives.

SOE governance therefore requires a multidimensional scorecard. Commercial measures should remain rigorous, but public obligations should be made explicit rather than hidden inside the income statement, reducing goal ambiguity and allowing stakeholders to distinguish genuine inefficiency from deliberately financed public-value activity. The broader literature on SOEs supports the need to recognise multiple mandates while preserving financial accountability and effective governance.

Proposed Theoretical Model: Consolidation-to-Turnaround Capability

The literature synthesis ultimately supports a six-stage mechanism. Structural consolidation first places assets and governance rights under one organisational platform, after which governance integration harmonises strategy, reporting, accountability, investment criteria and decision rights. Functional integration then aligns standards, information, expertise, procurement systems and regional coordination, while relational integration redesigns farmer and supplier relationships around credible incentives, transparency and productivity.

Financial conversion constitutes the fifth stage by translating operational gains into margins, working-capital efficiency and sustainable cash generation. Capability institutionalisation forms the sixth stage by embedding learning systems, resilient routines and leadership practices so that early turnaround becomes repeatable performance rather than a one-off result.

The stages are analytically sequential but operationally recursive. Farmer problems can trigger changes in factory scheduling; factory performance can alter financing needs; cash constraints can change procurement; new routines can affect employee engagement. The model is therefore a dynamic system rather than a linear checklist.

The main theoretical proposition is that the effect of structural consolidation on sustainable agro-industrial performance is mediated by operational, financial, relational and organisational integration and moderated by institutional mandates, legacy heterogeneity, climate conditions and local supply alternatives. This proposition reframes consolidation as a capability-building process rather than a one-time change in ownership structure [55-66].

A second proposition is that, in farmer-dependent processing industries, external relational integration is not supplementary to post-merger integration but one of the mechanisms through which internal consolidation produces productive value. This extends conventional post-merger theory by bringing upstream producers outside the formal ownership boundary into the causal architecture of integration.

A third proposition concerns financial quality: the sustainability of post-consolidation turnaround depends less on reported profitability alone than on the joint evolution of operating efficiency, working-capital conversion, investment capability and stakeholder supply resilience. Together, these propositions explain why apparently successful consolidation can remain fragile when operational, relational or financial integration is incomplete.

Conclusion

The consolidation of Indonesia's state-owned sugar mills into PT Sinergi Gula Nusantara provides an analytically valuable context for examining how restructuring becomes organisational turnaround. Official disclosures show that SGN received 36 sugar mills from seven legacy PTPN companies through the October 2022 spin-off and managed the consolidated portfolio for its first full year in 2023. In that year the company reported IDR3.776 trillion in sales, positive net profit, operating profit of more than IDR500 billion and EBITDA of approximately IDR1.1 trillion, while also operating under climate-related raw-material pressure. More than 80% of its sugarcane supply has been reported to come from farmers.

The evidence reviewed in this study cautions against attributing these outcomes mechanically to consolidation. Structural consolidation is only an enabling condition. Sustainable value depends on the quality of functional integration that follows.

Four integration capabilities appear particularly important. Together, they provide a more complete basis for evaluating turnaround than any single profitability or production indicator.

Operational integration coordinates factories, standards, maintenance, investment and cane catchments. Financial integration ensures that efficiency improvements are translated into liquidity and sustainable capital capacity rather than merely accounting profit. Relational integration secures the farmer supply base through transparent incentives, agronomic support and trust. Organisational integration aligns leadership, employees, management controls and learning systems.

These dimensions are mutually reinforcing. Factory improvement without farmer supply cannot sustain utilisation. Farmer programmes without financial discipline may strain liquidity. Central financial discipline without employee engagement can weaken implementation. The central strategic challenge is therefore to build a coherent system rather than optimise individual components.

The analysis also suggests that the next phase of state-owned sugar restructuring should move beyond cost reduction. A consolidated sugar platform can potentially support coordinated research, precision agriculture, varietal improvement, shared data infrastructure, renewable energy and circular bio-industrial development. Sugar-mill by-products increasingly have potential value in energy, fertiliser and biorefinery applications, and consolidation can make such investment more feasible by

spreading capabilities and capital across a larger network.

For management, the implication is to monitor transformation through an integrated dashboard combining factory reliability, recovery rate, cane availability, farmer productivity, farmer retention, payment reliability, operating margin, EBITDA, operating cash flow, inventory, debt, employee engagement and resilience. No single metric adequately represents turnaround.

For scholarship, future research should complement this qualitative literature review with longitudinal empirical investigation. Mill-level panel data could test whether regionalisation changes technical efficiency; farmer-level studies could examine whether revenue-sharing arrangements alter loyalty and welfare; financial analysis could reconcile margins, inventory and operating cash over several seasons; and interviews could examine how legacy cultures are actually integrating inside SGN.

The most consequential lesson is therefore broader than the SGN case. **Consolidating assets is relatively easy compared with consolidating capabilities.** Sustainable turnaround occurs only when a new corporate structure becomes a new operating system—one that coordinates factories and finances while simultaneously creating credible value for farmers, employees, shareholders and the broader public.

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