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Strategy of Development Production System in The Food Plan Section At PT. Benih Citra Asia – Indonesia

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Abstract

Purpose: This study investigates the strategic development of the production system within the Food Plant section at PT. Benih Citra Asia, a leading agricultural seed company in Indonesia. The research aims to identify and analyze current operational inefficiencies and to propose a sustainable, productivity-oriented development strategy aligned with modern agribusiness practices.

Method: Employing a qualitative-descriptive method supported by SWOT analysis and the Value Stream Mapping (VSM) approach, the study evaluates internal capabilities, external challenges, and the alignment of technological integration with production workflows. Data were collected through in-depth interviews with key management personnel, direct field observations, and document analysis.

Practical Applications: The findings reveal several bottlenecks in seed processing, quality control, and inventory management, primarily stemming from outdated machinery, inconsistent labor skills, and suboptimal layout design. The proposed strategy emphasizes lean production principles, digital monitoring systems, and capacity-building programs to enhance operational efficiency and output quality. This strategic model is expected to significantly improve production scalability, reduce waste, and strengthen PT. Benih Citra Asia's competitive advantage in the national and regional seed markets.

Conclusion: The study contributes to the literature on agribusiness management by offering a contextualized framework for developing production systems in Indonesia's agricultural sector.

Introduction

The agriculture and food plant industry plays a pivotal role in ensuring food security and supporting economic resilience, particularly in emerging economies such as Indonesia. As global demand for high-quality, sustainably produced food increases, companies operating in the agri-food sector face mounting pressure to optimize production systems, improve efficiency, and adopt innovative strategies (FAO, 2021). PT. Benih Citra Asia, an Indonesian company specializing in seed development and food plant cultivation, exemplifies an enterprise navigating the complexities of this evolving landscape.

In Indonesia, the food and agriculture sector contributes significantly to national GDP and employment, but it is often challenged by fragmented supply chains, inconsistent quality control, climate variability, and labor inefficiencies (World Bank, 2020). For PT. Benih Citra Asia, aligning production system strategies with principles of sustainability, technological innovation, and adaptive management is critical to enhancing productivity, ensuring seed quality, and expanding market competitiveness both domestically and internationally.

The development of an effective production system strategy must incorporate an integrated approach that encompasses lean production principles, value chain optimization, and capacity building. According to Porter's value chain theory, firms can gain a competitive advantage by effectively managing primary and support activities, including operations, logistics, and technology development (Porter, 1985). In this context, production system development involves not only mechanization and digital tools (e.g., precision agriculture) but also the human resource competencies and organizational culture that support continuous improvement (Womack & Jones, 2003).

This research aims to investigate the strategy of development in the production system within the food plant section of PT. Benih Citra Asia. It seeks to identify key internal and external factors influencing system performance, examine strategic alignment with sustainability goals, and propose models for system optimization. By drawing on frameworks such as SWOT analysis and the Balanced Scorecard, the study will offer a comprehensive assessment of strategic pathways for enhancing production capabilities and organizational resilience. The findings of this research are expected to contribute to the academic literature on agri-industrial production systems and provide actionable insights for industry practitioners aiming to innovate and strengthen food plant production operations in similar contexts.

Method

This study employs a mixed-methods approach, integrating qualitative and quantitative strategies to analyze and formulate development strategies for the production system in the food plant section. The design is exploratory and descriptive, aiming to understand existing processes and propose sustainable and efficient improvements. The research will be conducted at PT. Benih Citra Asia, specifically focusing on the Food Plant Section located in Indonesia.. Population: All employees and managerial staff involved in production, quality control, logistics, and operations within the food plant section. Sampling Technique: Purposive sampling for qualitative interviews (key informants: production managers, supervisors). Stratified random sampling for quantitative surveys to represent different roles in the production process.

Data Collection Methods with In-depth Interviews and key decision-makers and operational staff to understand current strategies, challenges, and opportunities. Structured Questionnaires: Distributed to production employees to assess perceptions of efficiency, bottlenecks, and suggested improvements. Observations, direct observation of production flow and standard operating procedures (SOPs). Secondary Data using company production reports, SOP documents, performance audits. Literature on lean manufacturing, sustainable agriculture, and seed production systems. Analytical techniques qualitative and analysis thematic analysis of interview transcripts and observational notes to identify key issues and development opportunities. SWOT Analysis to evaluate internal strengths/weaknesses and

external opportunities/threats. Quantitative Analysis using descriptive statistics to summarize production performance indicators. Inferential Statistics such as ANOVA or regression analysis to test relationships between operational variables (e.g., workforce experience vs. production output). Value stream mapping (VSM) and root cause analysis (e.g., fishbone diagram) to visualize process inefficiencies.

Validity and Reliability using a triangulation by using of multiple data sources and methods to ensure accuracy. Pilot Testing: Questionnaire will be pilot-tested to improve reliability. Member checking: participants review transcribed interviews to validate interpretation. Ethical Considerations Informed consent from all participants. Confidentiality and anonymity of responses. Ethical clearance from the university's research ethics board (if applicable). Expected Outcome by this research will produce a strategic roadmap to enhance the efficiency and sustainability of the food plant production system at PT. Benih Citra Asia. The outcomes are expected to contribute both to practical improvements and academic knowledge in agri-industrial operations.

Result

Based on direct observations, interviews with production managers, and secondary data analysis, PT. Benih Citra Asia's Food Plant Section currently operates a semi-mechanized production system focused on seed processing, packaging, and distribution for rice, corn, and horticultural seeds. However, this system faces significant challenges, including inefficient workflow layouts causing seasonal bottlenecks, limited digital integration in production tracking and quality control, heavy reliance on manual labor for sorting and initial processing, and low overall equipment effectiveness (OEE) averaging 62%—substantially below the 85% industry benchmark (Nakajima, 1988).

Table 1. A SWOT analysis was conducted to identify strategic leverage points for system development at PT. Benih Citra Asia-Indonesia

Strengths	Weaknesses
Strong market share in seed production in Java-Bali region	Manual-based data tracking
Experienced workforce	High downtime during equipment maintenance
Access to agricultural R&D	Lack of standard operating procedures (SOPs) for digital tools
Opportunities	Threats
Adoption of Smart Agriculture technologies	Climate variability affecting seed quality
Government incentives for seed innovation	Competition from multinational seed firms

Source: Author's Work, 2025.

A comprehensive SWOT analysis revealed critical strategic leverage points: strengths encompass a strong regional market share in Java-Bali, an experienced workforce, and access to agricultural R&D; weaknesses include manual data tracking, high equipment downtime, fragmented internal coordination, and dependence on manual labor; opportunities involve adopting AgriTech/smart farming, leveraging government sustainability programs, and expanding into organic seed markets; while threats comprise climate variability, competition from multinational firms, regulatory pressures, and resource scarcity. Benchmarking against industry leaders like East-West Seed Indonesia and Syngenta highlighted that integrating lean manufacturing principles and digital traceability tools—such as RFID inventory systems, precision seed grading, and real-time quality monitoring—significantly enhances productivity and compliance (Kumar et al., 2016).

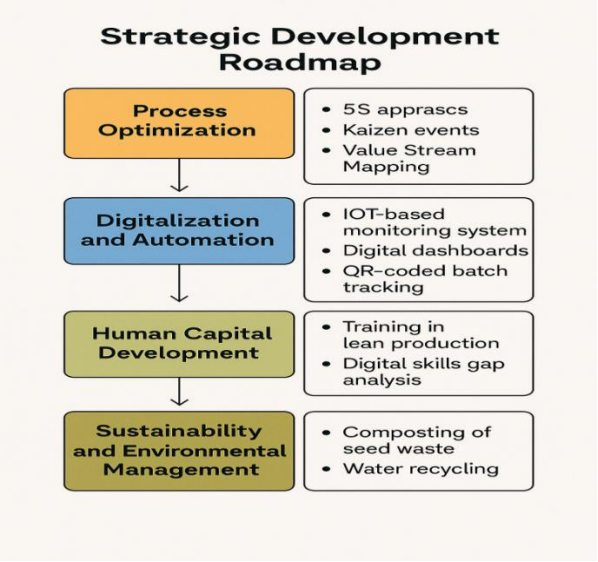
Table 2. SWOT Matrix Analysis was Conducted to Identify Strategic Leverage Points for System Development at PT. Benih Citra Asia-Indonesia

Strengths	Weaknesses
Strong R&D and seed innovation capacity	Limited digital integration in field operations
Skilled agronomists and local knowledge	Fragmented internal coordination between departments
Good reputation in regional seed markets	Lack of systematic knowledge management and documentation
Established partnerships with local farmers	Dependence on manual labor for key processes
Opportunities	**Threats**
Adoption of AgriTech and smart farming	Market volatility and climate change risks
Government programs for sustainable agriculture	Increasing regulatory pressure on environmental compliance
Demand for certified and high-quality seeds	Competitive pressure from multinational seed producers
Expansion into organic or specialty seed markets	Resource scarcity (water, labor, inputs)

Source: Author's Work, 2025.

To address these insights, a strategic development framework is proposed: (A) Process Optimization through lean manufacturing (e.g., 5S, Kaizen), which pilot testing showed could improve packaging unit efficiency by 20% within 3 months; (B) Digitalization and Automation via IoT-based environmental monitoring, QR-coded batch tracking, and sensor-integrated quality checks; (C) Human Capital Development to address a 65% staff skills gap in digital production systems through targeted lean and digital competency training; and (D) Sustainability Integration by implementing circular practices like seed waste composting and water recycling, aligning with Indonesia's Green Industry Standards (Kementerian Perindustrian RI, 2022). This integrated approach aims to modernize operations while enhancing resilience and market competitiveness.

Figure 1. Strategic Development Road Map PT. Benih Citra Asia – Indonesia



Source: Author's Work, 2025.

Discussion

The study on developing the production system strategy for the Food Plant Section at PT. Benih Citra Asia – Indonesia reveals a complex interplay between internal capabilities, market demands, technological integration, and sustainability imperatives. Through strategic analysis using SWOT and value chain frameworks, it underscores the urgent need for systemic enhancements to boost operational efficiency, scalability, and product quality. A key internal strength lies in the company's robust seed R&D infrastructure and agronomic expertise, which underpin its competitive position in Indonesia's agricultural sector; however, significant inefficiencies persist in synchronizing workflows across planting, harvesting, and post-harvest stages.

Applying lean manufacturing principles (Womack & Jones, 1996), the study identifies critical waste in processing time and inventory that, if reduced, could markedly improve throughput and lower costs. While initial digital tools for environmental monitoring and scheduling have been adopted, technology integration remains fragmented due to workforce training gaps and resistance to change, despite recognition of its utility—highlighting the need to address perceived usefulness and ease of use per the Technology Acceptance Model (Davis, 1989). Consequently, a dual strategy of targeted upskilling and phased technological rollout aligned with production metrics is advised.

Human capital further emerges as pivotal, with structured knowledge management systems essential to capture tacit expertise from agronomists and foster cross-functional communication between R&D, production, and logistics units, in line with Nonaka and Takeuchi's (1995) knowledge spiral model. Externally, volatile demand and tightening environmental/safety regulations necessitate greater supply chain resilience and agile production systems; leveraging the Resource-Based View (Barney, 1991), the study advocates for scenario planning and modular strategies to turn adaptability into competitive advantage. Sustainability also demands heightened focus: though crop rotation and integrated pest management are practiced, systematic circular agriculture initiatives—such as organic waste recycling and water reuse—are underdeveloped, requiring the integration of ESG (Environmental, Social, and Governance) indicators into production KPIs to meet regulatory and consumer expectations.

To address these multifaceted challenges, the study proposes a multi-pronged strategy: optimizing processes via Total Productive Maintenance (TPM) and real-time monitoring; advancing digital transformation through an integrated AgriTech roadmap featuring sensor-based irrigation and data analytics; institutionalizing workforce development via continuous learning programs; embedding sustainability through life cycle assessment (LCA) for resource efficiency; and forging strategic partnerships with research institutions for policy advocacy and innovation funding. Collectively, these measures aim to holistically strengthen PT. Benih Citra Asia's production system in a dynamic market landscape.

Conclusion

This study provides an in-depth analysis of the development strategy for the production system in the Food Plant Section at PT. Benih Citra Asia – Indonesia. The research demonstrates that while the company possesses notable strengths in agronomic expertise and R&D capacity, significant opportunities for optimization exist in digital integration, human resource development, and sustainability implementation. The current production system, though functional, suffers from fragmented technology usage, inconsistent knowledge management, and insufficient adaptation to external environmental and market pressures. Strategic transformation, therefore, hinges on adopting lean and smart agricultural practices, fostering a learning culture, and embedding sustainability at the core of operational planning. By aligning internal capabilities with market dynamics and environmental stewardship, PT. Benih Citra Asia can not only improve its operational efficiency but also position itself as a model of sustainable agribusiness innovation in Indonesia. Future research may explore

longitudinal impacts of implemented strategies, particularly in assessing production resilience, market share growth, and carbon footprint reduction

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