

Systematic Literature Review: Management Of Agricultural Land Transfer In Indonesia

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ABSTRACT

Agricultural land conversion in Indonesia continues to accelerate, threatening national food security, environmental sustainability, and the socio-economic stability of rural communities. This study examines the drivers, impacts, and control strategies of agricultural land conversion through a Systematic Literature Review of Scopus-indexed articles published between 2020 and 2025, retrieved using Harzing's Publish or Perish with the Crossref database. From an initial pool of one thousand articles, the screening and quality-assessment process yielded twenty-six articles for thematic analysis. The findings show that economic pressure, expansion of settlements and industry, urbanization, infrastructure development, and weak governance are the principal drivers of land conversion, producing impacts that include the loss of productive farmland, threats to food security, shifts in land tenure, and environmental degradation. Applying Fred R. David's strategic management framework reveals that strategy formulation rests on an adequate regulatory foundation, whereas implementation and evaluation remain weak due to fragmented inter-agency coordination, limited economic incentives for farmers, and the absence of an integrated One Map and real-time monitoring system. The novelty of this study lies in integrating SLR thematic synthesis with SWOT analysis and David's formulation-implementation-evaluation stages, a combination rarely applied explicitly to farmland-conversion research in Indonesia. The policy implications emphasize strengthening technology-based spatial governance, harmonizing cross-sector policy, and improving farmer welfare through stronger agricultural value chains to sustain long-term farmland protection..

Keywords: land conversion; farmland protection; Systematic Literature Review; strategic management

INTRODUCTION

Land management is an essential component of spatial governance and national development, particularly in an agrarian country like Indonesia. Land management is not only concerned with land rights administration but also encompasses utilization regulation, control of use, and protection of land as a strategic resource for sustainable development. In the past two decades, population growth, urbanization, and economic expansion have increased pressure on agricultural land and driven land conversion in various regions (FAO, 2011; Surya et al., 2020). This phenomenon is not a new problem, but its increasing intensity over the years makes it a strategic issue requiring ongoing study.



The decline of productive rice fields in Indonesia continues. Several reports from the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency indicate that the average rate of rice field conversion is in the range of 100,000 to 150,000 hectares per year (Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, 2022). According to a report by the Ministry of Agriculture, the area of rice fields in Indonesia is indicated to have decreased from approximately 8.1 million hectares in 2015 to 7.5 million hectares in 2019 (Ministry of Agriculture, 2020). More recent data reinforces this trend: paddy fields in Indonesia have shrunk from 8.4 million hectares in 1990 to 7.18 million hectares in 2022, equivalent to an average loss of over 38,000 hectares per year (Ivanka et al., 2024). This phenomenon is driven by economic incentives for non-agricultural uses, weak implementation of the Spatial Planning (RTRW), disharmony in inter-sectoral regulations, and pressure from national-scale development projects. These conditions indicate a disconnect between Sustainable Food Agricultural Land (LP2B) protection policies and the direction of economic development.

An international perspective further reinforces the urgency of this issue. The FAO (2011) emphasized that land and water resources are key elements in efforts to improve global food security, but population pressures, climate change, and increasing intersectoral competition for land use are further exacerbating the vulnerability of food systems. Deininger and Byerlee (2011) emphasized that global interest in agricultural land continues to grow, but large-scale land acquisition practices often face serious challenges, including weak local land rights, inadequate governance, a lack of reliable data, and high socio-environmental risks. A recent meta-analysis by Zhang et al. (2023) of 56 articles from four continents also confirmed that the socio-economic impacts of agricultural land conversion particularly the loss of household income and the increased potential for social conflict are consistent across developing countries, making this issue relevant not only to Indonesia but to agricultural countries in general.

The impacts of land conversion in Indonesia are multidimensional, encompassing reduced food production capacity, increased environmental risks, the emergence of agrarian conflicts, and changes in rural social structures. This multidimensional nature indicates that land conversion is not simply a matter of reduced cultivated area, but rather a source of structural problems that trigger cross-sectoral ripple effects. From an economic and food perspective, the shrinking of rice paddies reduces domestic production potential and increases vulnerability to food supply dependency. From an environmental perspective, agricultural land conversion, particularly in peri-urban areas, contributes to soil degradation, increased surface runoff, and reduced water absorption, which can increase the risk of flooding and drought. From a social perspective, land use change often triggers agrarian conflicts, ownership fragmentation, shifts in farmers' livelihoods, and the process of de-agrarianization in rural areas. From an institutional perspective, this phenomenon reflects the suboptimal effectiveness of spatial planning control, weak intersectoral coordination, and inconsistent implementation of agricultural land protection policies. This cross-dimensional complexity makes agricultural land conversion a strategic problem in sustainable agricultural development in Indonesia.

The government has implemented various policy efforts to control land conversion, including Law No. 41 of 2009 concerning the Protection of Sustainable Food Crop Land, the designation of LP2B areas in the Spatial Planning (RTRW), and the One Map Policy initiative to integrate spatial data across agencies (Faxon et al., 2022). However, these regulations have not been able to significantly curb the rate of conversion; in fact, in some areas, the rate of conversion tends to increase. This gap between formulated policies and empirical conditions on the ground is the primary reason this topic requires in-depth

research. The fundamental problem lies not in the absence of regulations, but rather in the effectiveness of policy implementation, institutional governance, and control mechanisms, which are not yet optimal. Limited integrated data, weak monitoring systems, and the absence of a comprehensive strategic approach to managing pressure on agricultural land further reinforce the urgency of this research.

Several previous studies have discussed agricultural land conversion in Indonesia, both from a spatial perspective using satellite imagery (Gandharum et al., 2022; Gandharum et al., 2025), a policy and regulatory perspective (Wahanisa et al., 2021; Kholik et al., 2024), and a farmer socio-economic perspective (Hidayat et al., 2021; Triyono et al., 2022). Systematic SLR-based studies on similar topics are also emerging, such as the review by Ivanka et al. (2024) which focuses on the implications of land conversion for food security, and the review by Chairunnisya and Jamil (2024) which highlights the implementation of the PRISMA-based LP2B policy. However, most of these studies are partial—they only address a specific dimension such as spatial, legal, or socio-economic aspects separately, without linking them to a strategic management framework capable of explaining why normatively sound policies continue to fail to control land conversion on the ground.

The distribution of previous study locations also reveals gaps that require further action. The majority of research has focused on Java, particularly West Java, Central Java, and the Special Region of Yogyakarta, a logical consequence of the high urbanization pressures and the rate of rice field conversion in these regions. Conversely, studies on the dynamics of land conversion in eastern Indonesia, such as East Nusa Tenggara, Maluku, and Kalimantan, remain very limited, even though these regions are also beginning to face pressures from investment, plantation expansion, and the development of strategic national infrastructure. This disparity in research distribution suggests that the national policy evidence base remains biased toward the Javanese context, requiring caution in generalizing land use management strategies to other regions.

The selection of Fred R. David's strategic management framework as an analytical tool in this study is based on the consideration that land conversion control is essentially a public policy management issue involving goal formulation, resource allocation, cross-actor coordination, and ongoing evaluation mechanisms—elements that align with the three main stages of strategic management: strategy formulation, implementation, and evaluation (David et al., 2023). This framework has been widely adapted in studies of natural resource management and public policy due to its ability to systematically map the strengths and weaknesses of a policy throughout its management cycle, not just at the formulation stage.

The novelty of this research lies in three aspects. First, it integrates the SLR thematic synthesis of 26 Scopus-indexed articles with a SWOT analysis and Fred R. David's (2023) strategic management framework, which encompasses three sequential stages: strategy formulation, implementation, and evaluation—an approach that has not been widely applied explicitly to studies of agricultural land conversion in Indonesia. Second, by mapping the causes and impacts of land conversion into each stage of strategic management, this study is able to specifically identify the stages at which land control failures are most prevalent, rather than simply concluding that "policy implementation is weak" in general. Third, this study formulates alternative national strategies based on a SWOT matrix (SO, ST, WO, WT) accompanied by measurable performance indicators, so that the results go beyond problem diagnosis to produce more applicable policy directions for stakeholders at the central and regional levels.

Based on the description, this study aims to: (1) identify the main factors causing agricultural land conversion in Indonesia based on the 2020-2025 literature synthesis;

(2) analyze the multidimensional impacts caused by land conversion on economic, social, and environmental aspects; (3) evaluate land conversion control strategies that have been offered in the literature using David's strategic management framework, including the formulation, implementation, and evaluation stages; and (4) formulate alternative agricultural land conversion control strategies that are more integrated and applicable for policy makers in Indonesia. With this analytical framework, this study is expected to provide academic contributions in the form of a comprehensive literature map, as well as practical contributions in the form of more operational policy recommendations for strengthening the protection of sustainable food agricultural land in Indonesia..

METHOD

The method used in this study is a Systematic Literature Review (SLR). Kitchenham (2004) defines SLR as a way to identify, evaluate, and interpret all available research relevant to a research question, a specific topic, or a phenomenon of interest. Methodologically, SLR in this study is positioned as a qualitative approach based on literature synthesis, because it emphasizes the process of interpreting research findings and mapping knowledge, enriched with simple descriptive statistics to illustrate the distribution of articles. This method was chosen because studies on land use change control are spread across various studies with diverse approaches, so a comprehensive and structured synthesis is needed to identify patterns of findings, research gaps, and policy implications.

The article collection process was carried out through four systematic stages, as depicted in Figure 1. The first stage, identification, was conducted through a literature search using Harzing's Publish or Perish software and the Crossref database. The keywords used were "controlling the conversion of agricultural land in Indonesia" with publication years ranging from 2020 to 2025. This initial search process yielded approximately 1,000 articles.

The second stage, screening, was carried out based on inclusion and exclusion criteria, namely: (1) peer-reviewed scientific journal articles, (2) relevant to the topic of controlling agricultural land conversion, (3) available in full text, and (4) not duplicated. This screening based on title and abstract resulted in 71 articles that were deemed relevant for further study.

The third stage, eligibility/quality assessment, was conducted to select articles that made substantive contributions to the research topic, taking into account the appropriateness of the study's focus, clarity of methodology, and the reputation of the publication sources (the majority of which were indexed by Scopus). This stage yielded 26 high-quality articles, which were then subjected to in-depth analysis.

In the fourth stage, selected (included) articles were analyzed using thematic synthesis to identify research trends, driving factors for land conversion, resulting impacts, and control strategies. The results of this thematic synthesis were then further analyzed using the SWOT matrix and Fred R. David's (2023) strategic management framework, which encompasses the stages of strategy formulation, implementation, and evaluation. Through these four stages, the SLR in this study is expected to provide a comprehensive and evidence-based picture of the dynamics of controlling agricultural land conversion in Indonesia.

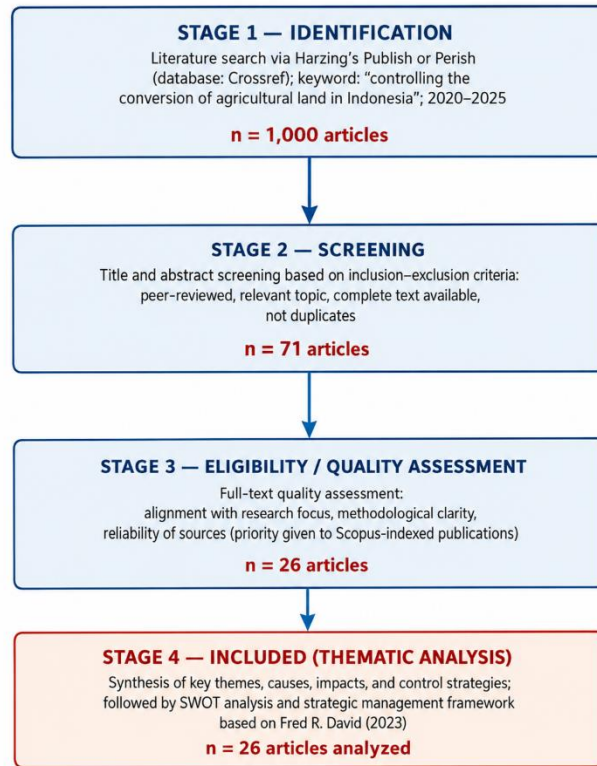


Figure 1. Article Selection Process Flowchart (PRISMA-style)

RESULTS AND DISCUSSION

The initial search process using Harzing's Publish or Perish yielded 1,000 articles. After screening based on title and abstract relevance, the number of articles was reduced to 71. A full-text quality and eligibility assessment was then performed, resulting in 26 articles meeting the criteria for further analysis in this study, as summarized in Table 1.

Table 1. Article Selection Process

Selection Stage	Number of Articles
Initial search results (Identification)	1,000
Title & abstract screening	71
Full-text and quality assessment (Eligibility)	26
Final analyzed article (Included)	26

In terms of location distribution, research on land conversion in Indonesia remains concentrated on the island of Java. Studies at the national and provincial levels in West Java each account for the highest share (19%), followed by Central Java and East Java (12%), and Java regionally, the Special Region of Yogyakarta, and South Sulawesi (8% each). The regions with the lowest research share (4%) are East Nusa Tenggara, East Kalimantan, Maluku, and South Sumatra. This pattern highlights a research gap in land conversion studies in eastern Indonesia, which is also beginning to face pressure from investment and plantation expansion.

Analysis of 24 of the 26 articles shows that agricultural land conversion is influenced by interrelated multidimensional factors, reflecting the interaction between

economic aspects, regional development, social dynamics, and government policies, as summarized in Table 2.

Table 2. Factors Causing Conversion of Agricultural Land

Causative factor	n	%	Example Source
Economy	16	23%	Prayitno et al. (2021); Triyono et al. (2022); Hidayat et al. (2021)
Residential, Commercial & Industrial Expansion	11	16%	Gandharum et al. (2022); Faoziyah et al. (2024)
Urbanization	9	13%	Syaban & Appiah-Opoku (2024); Ngongo et al. (2023)
Infrastructure Development	9	13%	Makbul et al. (2021); Prayitno et al. (2021)
Regulation / Policy	9	13%	Wahanisa et al. (2021); Kholik et al. (2024)
Social Society	6	9%	Hidayat et al. (2021); Wahanisa et al. (2021)
Investment	4	6%	Ngadi & Nagata (2022); Ngongo et al. (2023)
Regional Agglomeration	3	4%	Surya et al. (2020); Surya et al. (2021)
Palm Oil Plantation Expansion	3	4%	Ngadi & Nagata (2022); Chrisendo et al. (2021)

Economic factors are the most dominant driver (23%), including increasing land values, low farming profits, and the drive to obtain higher incomes from non-agricultural sectors (Prayitno et al., 2021; Triyono et al., 2022; Hidayat et al., 2021). The expansion of settlements, commercial areas, and industry comes in second place (16%), mostly occurring in rapidly growing urban areas and buffer zones (Gandharum et al., 2022; Faoziyah et al., 2024). Urbanization, infrastructure development, and regulations/policies each contribute 13%. The construction of toll roads and public facilities triggers changes in surrounding land use (Makbul et al., 2021), while urbanization accelerates the expansion of urban areas into productive agricultural land (Syaban & Appiah-Opoku, 2024; Ngongo et al., 2023). Social factors (9%) reflect changing farmer perceptions and the low interest of the younger generation in the agricultural sector (Hidayat et al., 2021; Wahanisa et al., 2021), while investment (6%), regional agglomeration, and palm oil expansion (4% each) complete the causal pattern of land conversion (Chrisendo et al., 2021; Ngadi & Nagata, 2022). These findings confirm that land conversion is not caused by a single factor, but rather the result of complex interactions between various factors, necessitating an integrated and cross-sectoral policy approach.

A total of 19 of the 26 articles discussed the impacts of land conversion, which are multidimensional in nature and include physical, economic, social and environmental aspects, as summarized in Table 3.

Table 3. Impact of Agricultural Land Conversion

Impact	n	%	Example Source
Loss of Productive Agricultural Land	13	28%	Gandharum et al. (2025); Surya et al. (2020)
Threats to Food Security	9	20%	Martanto et al. (2023); Kholik et al. (2024)
Changes in Land Tenure & Use	8	17%	Chrisendo et al. (2021); Mandala et al. (2024)
Environmental Degradation	6	13%	Surya et al. (2021); Ngongo et al. (2023)

Shifting Livelihoods	4	9%	Chrisendo et al. (2021); Widianingsih et al. (2024)
Agrarian Conflict	3	7%	Widianingsih et al. (2024); Syaban & Appiah-Opoku (2024)
Socio-Economic	3	7%	Martanto et al. (2023); Surya et al. (2020)

The loss of productive agricultural land is the most dominant impact (28%), resulting from the increasing need for land for settlements, infrastructure, and industrial areas (Gandharum et al., 2025; Surya et al., 2020). Threats to food security are in second place (20%), reflected in declining food production and increasing food vulnerability at the regional and national levels (Martanto et al., 2023; Kholik et al., 2024). Changes in land ownership and use (17%) indicate a shift in land ownership structure due to increasing land economic value and the influx of investment interests (Chrisendo et al., 2021; Mandala et al., 2024), while environmental degradation (13%) includes decreasing land carrying capacity, ecosystem damage, and increasing flood risk (Surya et al., 2021; Ngongo et al., 2023). Other impacts, including shifts in livelihoods (9%), potential for agrarian conflict and socioeconomic issues (7% each), demonstrate that land conversion contributes to changes in rural social structures, including increasing inequality in access to agrarian resources (Widianingsih et al., 2024). This pattern of impacts aligns with the findings of Zhang et al.'s (2023) meta-analysis, which also identified loss of household income and increased potential for social conflict as the most consistent consequences of agricultural land conversion across developing countries.

Of the 26 articles analyzed, 24 of them discussed land conversion control strategies, which are summarized in Table 4.

Table 4. Agricultural Land Conversion Control Strategy

Control Strategy	n	%	Example Source
Law Enforcement / Regulation	12	20%	Wahanisa et al. (2021); Kholik et al. (2024)
Farmer Protection & Empowerment	10	17%	Triyono et al. (2022); Wahanisa et al. (2021)
Stakeholder Engagement	6	10%	Gandharum et al. (2022); Widianingsih et al. (2024)
Technology-Based Control	6	10%	Gandharum et al. (2025); Adrian et al. (2024)
Zoning / Spatial Planning	6	10%	Martanto et al. (2023); Mandala et al. (2024)
Sustainable Development	6	10%	Surya et al. (2020); Surya et al. (2021)
Strengthening Social Cohesion	5	8%	Prayitno et al. (2021); Hidayat et al. (2021)
Agricultural Intensification	4	7%	Ngongo et al. (2023); Kholik et al. (2024)
Agricultural Extensification	4	7%	Widianingsih et al. (2024); Mulyani et al. (2023)

Law enforcement and regulation are the most dominant strategy (20%), encompassing spatial planning oversight and the implementation of LP2B protection policies (Wahanisa et al., 2021; Kholik et al., 2024). Farmer protection and empowerment come in second (17%), encompassing education and training, credit access, irrigation development, and agricultural price incentives (Triyono et al., 2022). Stakeholder engagement, technology-based control, zoning/spatial planning, and sustainable development each contribute approximately 10%. Technology-based control utilizes geospatial approaches and data-driven monitoring systems to support evidence-based

policy (Gandharum et al., 2025; Adrian et al., 2024), aligning with the one-map policy initiative, which aims to integrate spatial data across institutions but still faces institutional barriers in practice (Faxon et al., 2022). Agricultural intensification (10%), strengthening social cohesion (8%), and agricultural extensification (7%) through the use of reserve land (Mulyani et al., 2023) complete the spectrum of strategies found in the literature. Overall, the synthesis confirms that controlling land conversion requires a multidimensional approach, combining regulatory instruments with farmer economic empowerment, consistent spatial planning, and technology utilization.

To understand why these strategies have not been effective in curbing land conversion, the synthesis results were further analyzed using Fred R. David's (2023) strategic management framework, which includes three stages: strategy formulation, implementation, and evaluation. The strategy formulation stage, which includes identifying external opportunities and threats and internal strengths and weaknesses, is summarized in the SWOT matrix in Table 5.

Table 5. SWOT Matrix for Controlling Agricultural Land Conversion in Indonesia

STRENGTH (S) — Internal	WEAKNESSES (W) — Internal
S1. Land protection regulatory & policy framework available (LP2B, RTRW, Food Law)	W1. Law enforcement is inconsistent, vulnerable to intervention by economic/political interests.
S2. Farmer empowerment and social protection programs have become a national agenda	W2. Farmers' economic dependence is high, making it easy to sell land.
S3. The use of land monitoring technology has begun to be implemented	W3. Spatial data integration & cross-agency coordination are still weak
S4. Zoning & sustainable development initiatives are getting stronger	W4. Economic incentives to maintain land are inadequate.
OPPORTUNITY (O) — External	THREAT (T) — External
O1. Global support for food security & SDGs	T1. Strong economic pressure (land value > agricultural output)
O2. Agricultural technology innovation & satellite monitoring	T2. Residential, industrial, and commercial expansion
O3. Multi-stakeholder collaboration increases	T3. Urbanization & professional change of the younger generation
O4. Green investment and sustainable CSR	T4. National infrastructure development targets productive land

The SWOT analysis shows that the main strength lies in the availability of a regulatory framework (LP2B, RTRW, Food Law) and the introduction of land monitoring technology, while the main weaknesses are inconsistent law enforcement and the high economic dependence of farmers on land sales. Externally, the greatest opportunities come from global support for food security and innovation in satellite monitoring technology, while the main threat remains economic pressure that makes land sales prices higher than agricultural yields. Based on this matrix, a combination of SO strategies (leveraging regulatory strengths for digital transformation of land control) and ST (strengthening risk-based regulations for conversion and intensification of urban fringe areas) is considered the most realistic to prioritize, because it leverages the already

relatively strong regulatory foundation to respond to the most dominant economic threats.

At the formulation stage, literature findings indicate that regulatory enforcement is the most dominant theme, but the resulting strategy remains fragmented due to a lack of integrated social, economic, and technological aspects. Satellite imagery-based land monitoring technology and Google Earth Engine, developed in various studies (Gandharum et al., 2022; Gandharum et al., 2025), have proven academically advanced, but have not been integrated into the decision-making bureaucracy, making it difficult to update LP2B zoning in real time. Weaknesses in inter-sectoral coordination are also consistently found, with agriculture, spatial planning, and licensing agencies often operating without adequate synchronization (Surya et al., 2020; Wahanisa et al., 2021), so the formulation of the national strategy remains essentially normative despite its strong regulatory foundation.

The implementation phase has proven to be the most critical point in the strategic management cycle of land control. Various articles indicate that conversion continues even in areas designated as LP2B, indicating that field monitoring mechanisms are ineffective, particularly at the regional level (Syaban & Appiah-Opoku, 2024). Farmer protection and empowerment programs—including training, credit access, irrigation, and price incentives—have not been prioritized in regional budgets, thus maintaining high economic pressure on smallholder farmers and driving land release (Triyono et al., 2022). Sustainable development principles have also not been translated into operational indicators in regional planning, resulting in policy implementation remaining largely at the level of normative documents rather than concrete actions on the ground.

The strategy evaluation phase which includes reviewing internal and external factors, measuring performance, and implementing corrective actions has also not been optimal. Most of the articles reviewed did not report any regularly measurable performance indicators related to the effectiveness of LP2B protection, thus lacking policy feedback to correct ineffective policies. Consequently, the strategic management cycle for controlling land conversion in Indonesia is incomplete: strong in the formulation phase, but weak in implementation and evaluation.

This finding aligns with Chairunnisya and Jamil's (2024) systematic review, which also concluded that the implementation of Law Number 41 of 2009 in various regions still faces institutional coordination challenges. Adrian et al.'s (2024) study in Majalengka Regency, which showed that GIS integration for establishing food land protection areas is only effective if accompanied by consistent regional institutional commitment. This convergence of findings from various regional contexts strengthens the argument that the root of the problem of land conversion in Indonesia lies not in weak policy formulation, but rather in weak implementation consistency and the absence of a binding, periodic evaluation mechanism.

Based on the overall synthesis, the alternative strategies formulated in this study include three sequential stages following David's framework. In the formulation stage, the proposed vision is the realization of sustainable agricultural land protection to ensure food security and farmer welfare, outlined through five main missions: strengthening land governance, modernizing agricultural systems, optimizing spatial information technology, strengthening multi-stakeholder coordination, and maintaining ecosystem sustainability. In the implementation stage, this study proposes the formation of a cross-agency task force (ATR/BPN, Ministry of Agriculture, Ministry of Public Works and Housing, regional governments, and villages), the integration of a one-map policy-based licensing system for early detection of conversion, and the linking of regional performance compensation to the achievement of LP2B protection. In the evaluation

stage, periodic audits of the protected LP2B area and the level of spatial planning compliance are proposed, accompanied by corrective action mechanisms in the form of strengthened sanctions and accelerated licensing reform. This series of strategies is expected to close the gap between the relatively strong policy formulation and implementation and evaluation, which remain the main weaknesses in controlling agricultural land conversion in Indonesia.

Overall, this synthesis of 26 articles demonstrates a pattern consistent with similar systematic reviews in more specific contexts, such as the review by Ivanka et al. (2024), which also concluded that settlement pressures, urbanization, and infrastructure development are the main drivers of rice field conversion in Indonesia. However, this study goes further by not stopping at merely identifying the causes and impacts, but rather placing these findings within a sequential strategic management framework, thereby demonstrating more precisely that the main problem in controlling land conversion in Indonesia lies not in the absence of policies, but in the weak consistency of policy implementation and evaluation in the field. This comparison simultaneously confirms the study's contribution to enriching the land management literature in Indonesia, while also opening up space for further research that empirically tests the effectiveness of the proposed formulation-implementation-evaluation strategy in more diverse regional contexts, including areas outside Java that have remained understudied

CONCLUSION

This systematic literature review confirms that Strategic Talent Management in the digital era constitutes a powerful driver of both organizational performance and competitive advantage. The evidence across diverse industrial and geographic contexts consistently demonstrates that organizations investing strategically in talent acquisition, development, retention, performance management, knowledge management, and digital leadership development outperform peers on productivity, innovation, financial results, and long-term resilience.

The digital transformation of talent management introduces qualitative changes not merely technological upgrades—to how human capital is cultivated and deployed. The integration of AI-driven analytics, agile performance ecosystems, and continuous digital learning transforms talent management from a reactive administrative function into a proactive strategic capability. This transformation directly amplifies the VRIN properties of human capital, deepening the competitive moat that talented, committed, and digitally adept workforces create.

Future research should pursue empirical quantification of the specific digital STM practices with the highest return on investment across different organizational contexts, industry types, and cultural settings. Mixed-method studies combining longitudinal quantitative performance data with qualitative insights into implementation dynamics would substantially advance understanding. Additionally, the moderating roles of organizational ambidexterity, digital maturity levels, and national institutional environments warrant dedicated investigation.

For practitioners, this review underscores the urgency of treating talent management as a boardroom-level strategic priority in the digital economy. The organizations that will sustain competitive advantage in an AI-augmented world are those that strategically develop the rare, complex, and continuously adaptive human capabilities that machines are least positioned to replicate.

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