

Developing a Sustainable Spatial Economic Management Framework: A Case Study of Lamphun Province, Thailand

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Abstract

This study aims to develop and analyze a balanced development framework integrating economic, social, and environmental dimensions to support the sustainable management of a strategic economic development zone in Lamphun Province, Thailand. The proposed framework emphasizes enhancing regional economic competitiveness

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while simultaneously improving population well-being and ensuring the long-term resilience of natural resources and environmental systems. The research adopts a mixed-methods approach, combining a systematic review of relevant literature and secondary empirical datasets with spatial statistical analysis, in-depth interviews with experts and key stakeholders, and strategic situational analyses using SWOT, PESTEL, and TOWS frameworks. The analytical results are further integrated with the Bio-Circular-Green (BCG) Economy Model and aligned with the United Nations Sustainable Development Goals (SDGs). The findings indicate that Lamphun Province exhibits strong structural potential for strategic economic zone development, particularly through its technology-oriented industrial base, investment-supportive infrastructure, and strategic connectivity with major regional economic hubs. However, critical challenges persist, including demographic aging, limited economic diversification, and increasing environmental pressures related to intensive water and energy use. The strategic assessment highlights the necessity of prioritizing smart and green industrial transformation, strengthening public services, education systems, and workforce upskilling, as well as conserving natural

resources and promoting sustainable and community-based ecotourism. The proposed framework provides policy-relevant insights for provincial-level decision-making, spatial economic zone planning, infrastructure investment prioritization, and the design of integrated sustainability-oriented governance models. These findings contribute to advancing place-based sustainable development strategies applicable to regions facing similar structural and environmental constraints.

Keywords: sustainable development, strategic economic zones, balanced territorial development, BCG economy model, systems-based analysis-The abstract is generally complete, however

Introduction

Provincial-level economic development plays a significant role in driving national economic growth, particularly in the context of increasing regional and global competition. (Álvarez-Herranz, et. al., 2026). Economic expansion contributes not only to productivity and income generation but also affects social structures, environmental conditions, and the quality of life of local populations. Development that lacks balance among these dimensions may lead to social inequality, environmental degradation, and long-term economic

vulnerability (Afriyie, et. al., 2018). Consequently, integrated economic development approaches that balance economic, social, and environmental dimensions have become an important priority in contemporary development policy.

Lamphun Province is one of the major economic areas in Northern Thailand and plays an important role in industrial production, export-oriented manufacturing, and regional logistics. (Yuan, et. al., 2023). The province is strategically located within the Northern Economic Corridor (NEC), which has been designated as a key regional economic development zone. This positioning makes Lamphun an appropriate case for examining sustainable spatial economic management at the provincial level (Aornsibutr, 2013).

Despite its economic potential, Lamphun Province faces several structural challenges. These include the need to upgrade infrastructure to support high-technology industries, increasing demand for skilled labor, demographic aging, environmental pressures associated with industrial expansion, and limitations in governance coordination. Such challenges have significant implications for spatial planning, resource management, and long-term regional sustainability

Existing studies on sustainable development, special economic zones, and regional competitiveness emphasize the importance of integrated governance, public participation, and

environmental management. Concepts such as Local Economic Development (LED), Sustainable Development Goals (SDGs), and sustainable urban development frameworks highlight the need to balance economic growth with social inclusion and environmental sustainability. (Elkington, 1997). Previous research also suggests that effective territorial development depends on coordination among policy mechanisms, infrastructure systems, local communities, and institutional governance structures

However, limited studies have integrated economic, social, and environmental dimensions into a unified spatial economic management framework at the provincial level in Thailand. In particular, empirical research focusing on strategic economic development in Lamphun Province within the context of the Northern Economic Corridor remains limited. Most existing studies focus primarily on industrial development or economic growth without sufficiently examining multidimensional territorial governance and sustainability integration.

Accordingly, this study aims to develop and analyze a spatial economic management framework integrating economic, social, and environmental dimensions for sustainable territorial development in Lamphun Province. (Gennusa, 2025). The study focuses on policy-oriented analysis, governance mechanisms,

public participation, infrastructure development, and sustainability-based spatial management approaches. The findings are expected to contribute to territorial governance literature and provide practical policy recommendations for provincial economic zone management and sustainable regional development in areas facing similar structural and environmental challenges.

1. Context and Development Potential of Lamphun Province

1.1 Provincial Context and Strategic Location

Lamphun Province is located in Northern Thailand and is characterized by lowland plains and foothill areas suitable for urban, industrial, and agricultural development. (Worapongpat, 2026b). The province also possesses a long historical background as the center of the ancient Hariphunchai civilization, which contributes significantly to its cultural identity and tourism potential. Historical and cultural resources, particularly Wat Phra That Hariphunchai, represent important cultural assets supporting local economic development.

1.2 Economic Structure and Industrial Competitiveness

Lamphun Province has a strongly industrial-based economy, particularly in export-oriented manufacturing industries such as electronics, semiconductors, electrical appliances, and industrial components. (Industrial Estate Authority of Thailand.

2023). Industrial development is concentrated primarily within major industrial estates, including Industrial Estate Authority of Thailand industrial zones and the World Lamphun Industrial Estate, which have positioned the province as one of the major manufacturing bases in Northern Thailand.

Table 1 presents the Gross Provincial Product (GPP) structure of Lamphun Province in 2020

Economic Sector	GPP Value (Million Baht)	Percentage (%)
Agriculture	13,646	16.5
Industry	42,631	51.6
Services	26,311	31.9
Total	82,588	100.0

Source: Office of the National Economic and Social Development Council & Lamphun Provincial Industry Office (2020).

The data indicate that the industrial sector contributes more than half of total provincial output, reflecting Lamphun’s strong dependence on export-driven manufacturing and industrial investment. The service and agricultural sectors continue to play complementary roles in supporting regional economic stability and employment generation. (Worapongpat, 2025a).

1.3 Demographic and Socioeconomic Conditions

According to the Lamphun Provincial Statistical Office (2024), the province has a population of approximately 399,557 persons, an average household income of around 25,377 baht per month, and an unemployment rate of approximately 1.18 percent. These indicators reflect relatively stable economic conditions and labor market performance.

1.4 Implications for Sustainable Spatial Economic Development

Although Lamphun Province demonstrates strong economic and industrial potential, rapid industrial expansion may generate pressures on natural resources, environmental quality, infrastructure systems, and social inequality if development is not managed systematically. (Worapongpat, 2026a). Sustainable spatial economic development therefore requires integrated governance mechanisms that balance economic growth with environmental sustainability and social well-being.

2.Social Dimension

2.1 Population Structure and Labor Conditions

Lamphun Province has a population of approximately 399,557 persons and a relatively low unemployment rate of around 1.18 percent, indicating comparatively stable labor

market conditions. Although the provincial economy is strongly driven by industrial production, employment in the agricultural and service sectors remains important for household income distribution and social stability.

2.2 Aging Society and Social Transformation

Lamphun Province is experiencing a demographic transition toward an aging society, with elderly persons accounting for approximately 26.21 percent of the population, exceeding the national average. (Jarempanit, et. al., 2025). This trend has important implications for healthcare systems, labor availability, social welfare provision, and long-term economic productivity.

2.3 Educational Development and Workforce Readiness

The provincial education system includes basic, secondary, and vocational education institutions that support labor force development for industrial and service sectors. (Worapongpat, 2025c). However, the current education structure still faces limitations in responding to the demand for specialized and technology-oriented skills associated with industrial transformation.

Particular emphasis is required on technical and vocational education and training (TVET), lifelong learning, and

collaboration between educational institutions and the private sector. Workforce development strategies should focus on digital skills, innovation capabilities, and industry-oriented training programs to enhance labor adaptability and regional competitiveness.

2.4 Public Health and Community-Based Healthcare Systems

Public health remains an important component of sustainable territorial development in Lamphun Province. (Khonsue, et. al., 2024). Historical health data indicate that major health concerns include pneumonia, chronic kidney disease, lung cancer, and other chronic non-communicable diseases. These conditions increase pressure on healthcare systems and require long-term preventive and community-based health management strategies.

2.5 Implications for Sustainable Social Development

The social, educational, and public health dimensions of economic zone development are closely interconnected. (Kogpho, et. al., 2024). Economic growth alone is insufficient if it is not accompanied by improvements in quality of life, healthcare accessibility, educational opportunities, and social inclusion.

3. Public Health Dimension

3.1 Disease Burden and Healthcare Systems

Public health is a critical component of sustainable territorial development in Lamphun Province. (Lamphun Provincial Statistical Office, 2024). Historical health data indicate that major health concerns in the province include pneumonia, chronic kidney disease, and lung cancer, alongside other chronic non-communicable and infectious diseases. (Worapongpat, 2025b). These conditions place increasing pressure on healthcare systems and highlight the importance of preventive healthcare, disease surveillance, and accessible medical services.

3.2 Health Promotion and Vulnerable Population Groups

Older adults constitute a major target group for health promotion policies due to their higher vulnerability to chronic diseases and healthcare dependency. (Maolanont, Pochanart, 2023). Previous studies suggest that health awareness, accessibility to healthcare services, and community support mechanisms significantly influence the quality of life of elderly populations.

3.3 Community-Based Healthcare Mechanisms

Older adults constitute a major target group for health promotion policies due to their higher vulnerability to chronic diseases and healthcare dependency. (Maolanont, Pochanart, 2023). Previous studies suggest that health awareness, accessibility to healthcare services, and community support mechanisms significantly influence the quality of life of elderly populations.

3.4 Implications for Sustainable Development

The development of strategic economic zones should not focus solely on economic expansion but must also prioritize public health and social well-being. Sustainable territorial development requires integrated policy approaches linking healthcare systems, education, workforce development, and social welfare within a unified spatial governance framework. (Marks, Hooghe, 2004).

4. Political and Administrative Dimension: Governance for Sustainable Spatial Economic Development

4.1 Governance Structure and Institutional Roles

The governance structure of Lamphun Province can be categorized into three interconnected levels.

Provincial Governance

Provincial authorities, led by the Governor and line agencies, are responsible for strategic policy coordination, economic planning, infrastructure development, and alignment with national and regional development frameworks such as the Northern Economic Corridor (NEC). (Marukhlenko, et. al., 2023). Provincial institutions also play a central role in integrating economic development policies with environmental and social management strategies.

Local Administrative Organizations

Local Administrative Organizations (LAOs), including municipalities, subdistrict administrative organizations, and the Provincial Administrative Organization (PAO), are responsible for local public services, infrastructure provision, environmental management, and community-level development. Their role is particularly important in regulating land use, managing local environmental impacts, and facilitating public participation. (Worapongpat, 2026d).

Civil Society and the Private Sector

Civil society organizations, local communities, and private-sector actors contribute through participatory governance mechanisms, including public hearings, community

consultation forums, and sustainability initiatives. Increasingly, industrial operators are adopting Environmental, Social, and Governance (ESG) approaches and corporate social responsibility (CSR) programs to support sustainable industrial development.

4.2 Governance and Sustainable Development Integration

The governance system directly influences the interaction between economic, social, and environmental dimensions.

From an economic perspective, transparent administrative systems, efficient investment procedures, and consistent industrial regulations help reduce transaction costs and improve investor confidence. (Mud-ardam, et. al., 2024). Effective governance also supports local revenue generation and regional competitiveness.

Socially, participatory governance mechanisms are essential for reducing conflicts between industrial operators and local communities. Inclusive decision-making processes improve policy legitimacy and strengthen social trust, particularly regarding labor protection, occupational safety, and equitable development outcomes.

Environmentally, governance institutions play a central role in enforcing environmental regulations, including environmental impact assessments (EIA), pollution monitoring, wastewater management, and low-carbon development policies. Local authorities are therefore critical actors in ensuring that industrial growth does not generate long-term ecological degradation.

4.3 Governance Challenges and Structural Constraints

Despite strong economic potential, several governance-related challenges continue to affect sustainable development management in Lamphun Province.

One major challenge involves institutional fragmentation and limited coordination among central government agencies, local authorities, and the public sector. (Muanglue, Tiyaipiphat, 2024). In addition, local administrative organizations often possess limited authority in regulating industrial pollution and environmental compliance.

Conflicts between industrial development and community interests also remain significant, particularly regarding land use, environmental impacts, and resource allocation. Unequal bargaining power between local

communities and large industrial actors may further intensify governance tensions.

Another important limitation concerns data integration and evidence-based governance. Effective territorial management requires reliable and integrated datasets covering labor conditions, environmental quality, public health, and spatial development. However, data fragmentation across agencies continues to constrain policy coordination and long-term planning.

4.4 Strategic Directions for Sustainable Governance

To strengthen sustainable territorial governance, Lamphun Province should pursue integrated governance strategies emphasizing transparency, participation, accountability, and institutional coordination. (Office of the National Economic and Social Development Council, 2023a). The establishment of Local Sustainability Councils and inter-agency governance platforms may further improve coordination among provincial authorities, local governments, communities, and private-sector stakeholders.

4.5 Governance Indicator Framework

To support policy evaluation and long-term monitoring, this study proposes a governance indicator framework consisting of four key dimensions:

Governance Dimension	Example Indicators
Transparency and Accountability	Open data availability, integrity index, public disclosure systems
Public Participation	Participation rates in consultation processes, implementation of community proposals
Administrative Efficiency	Project approval duration, environmental law enforcement rates
Social and Environmental Justice	Community complaints, dispute resolution efficiency, environmental compliance

These indicators provide a practical framework for assessing governance effectiveness within strategic economic development zones and may support future policy evaluation and comparative territorial studies.

4.6 Implications for Sustainable Spatial Governance

The political and administrative dimension represents the core institutional mechanism linking economic development with social stability and environmental sustainability. (Office of the National Economic and Social Development Council. 2023b). Sustainable governance in Lamphun Province therefore depends on transparent institutions, participatory planning, integrated data systems, and effective coordination among government agencies, local communities, and industrial actors.

5. Natural Resources, Environment, and Tourism Dimension

Natural resources, environmental quality, and tourism constitute fundamental components of sustainable spatial development in Lamphun Province. (Porter, 1998). The province possesses significant ecological and cultural assets, including forest ecosystems, river systems, agricultural landscapes, and historical tourism sites. At the same time, rapid industrial expansion and infrastructure development have intensified pressures on natural resources and environmental systems. Sustainable governance therefore requires integrated management approaches capable of balancing economic growth with environmental conservation and community well-being.

5.1 Natural Resource Conditions and Development Pressures

Lamphun Province possesses diverse natural resources that support agriculture, tourism, industry, and local livelihoods. (Promphenrangsi, Taeporamaysamai, 2024). Major resources include forest and conservation areas, river systems such as the Ping River, agricultural land, and favorable climatic conditions supporting both agricultural production and tourism activities.

However, increasing industrialization has generated growing pressures on these resource systems. Competition over water use among industrial, agricultural, and residential sectors has become increasingly significant, particularly during periods of water scarcity. Industrial expansion and urbanization have also contributed to land-use transformation, ecosystem fragmentation, and increasing risks of environmental degradation.

5.2 Environmental Risks and Sustainability Challenges

Environmental pressures in Lamphun Province are closely associated with industrial development, urban growth, transportation systems, and agricultural activities. Major environmental concerns include air pollution from agricultural burning and industrial emissions, water pollution associated with wastewater discharge, solid waste accumulation, and land-use conversion from agricultural to industrial areas.

Environmental degradation affects all dimensions of sustainable development. Economically, environmental problems may increase production and mitigation costs while reducing regional investment attractiveness. (Rakkhathiwong, et. al., 2024). Socially, pollution and resource degradation negatively affect public health and may intensify conflicts between local communities and industrial operators. Ecologically, long-term environmental deterioration threatens biodiversity, forest systems, water security, and ecosystem resilience.

5.3 Tourism and Sustainable Local Development

Tourism represents an important mechanism for promoting balanced territorial development in Lamphun Province. (Sirilertworakul, 2021). The province demonstrates strong potential in cultural tourism, nature-based tourism, agricultural tourism, and wellness tourism. Key attractions include Wat Phra That Hariphunchai, historical sites associated with the Hariphunchai civilization, natural parks, cycling routes, and community-based agricultural activities.

Sustainable tourism contributes to local economic diversification, employment generation, and cultural preservation while reducing excessive dependence on heavy industrial development. Community-based and environmentally responsible tourism models may also strengthen local participation and improve income distribution within rural areas.

5.4 Strategic Challenges and Opportunities

Lamphun Province faces several interconnected sustainability challenges, including:

- competition over water resources;
- industrial pollution risks;
- land-use conflicts;
- unequal tourism development;
- and climate-related environmental vulnerabilities.

At the same time, the province possesses substantial opportunities for sustainability-oriented transformation. (Stimson, et. al., 2006). The Bio-Circular-Green (BCG) Economy Model provides an important framework for promoting resource-efficient industries, environmentally responsible production systems, and low-carbon economic development.

Additional strategic opportunities include:

- green industrial estate development;
- smart eco-industrial systems;
- low-carbon tourism initiatives;
- integrated water management technologies;
- and open environmental data platforms supporting transparency and evidence-based governance.

5.5 Integrated Sustainability Governance Framework

This study proposes an integrated governance framework based on four interconnected mechanisms:

Governance Mechanism	Strategic Focus
Regulation	Environmental law enforcement, land-use planning, pollution control
Incentives	Support for green industries, BCG investment, sustainable tourism
Participation	Community engagement and multi-stakeholder decision-making
Information	Open environmental data systems and spatial monitoring

The framework aims to strengthen coordination among government agencies, local communities, industrial operators, and tourism stakeholders to support balanced territorial development.

5.6 Implications for Sustainable Spatial Development

Natural resources, environmental quality, and tourism collectively represent critical foundations for long-term regional sustainability in Lamphun Province. Sustainable economic zone

governance therefore requires integrated approaches that simultaneously address industrial competitiveness, environmental protection, social inclusion, and community resilience.

6. Infrastructure, Technology, and Innovation for Sustainable Economic Development

Infrastructure, technology, and innovation constitute critical enabling factors for sustainable economic zone development in Lamphun Province. (Supinrat, Asawimolkit, 2025). As the province continues to develop as an industrial and logistics center within the Northern Economic Corridor (NEC), long-term competitiveness increasingly depends on the integration of smart infrastructure, digital technologies, environmental sustainability, and innovation-oriented governance systems.

6.1 Infrastructure Conditions and Strategic Needs

Lamphun's industrial activities are concentrated primarily within major industrial estates, requiring efficient infrastructure systems capable of supporting industrial production, transportation, urban expansion, and public service delivery. (Tangtipongkul, et. al., 2021). Existing strengths include stable electricity supply systems, regional logistics connectivity, proximity to Chiang Mai International Airport, and water resources linked to the Mae Kuang and Mae The river systems.

6.2 Technology and Innovation Transformation

Technological transformation represents an important opportunity for upgrading Lamphun's industrial structure toward higher-value and sustainability-oriented production systems. Emerging technologies relevant to the province include:

- Industrial Internet of Things (IIoT);
- artificial intelligence (AI) and machine learning;
- automation and robotics;
- renewable energy and smart-grid systems;
- geospatial technologies;
- and digital healthcare applications.

These technologies can improve industrial productivity, reduce labor constraints associated with demographic aging, and strengthen environmental management efficiency.

The integration of technology and sustainability principles also supports the transition from conventional industrial estates toward Smart Industrial Estates and Eco-Industrial Towns aligned with Environmental, Social, and Governance (ESG) principles and the Bio-Circular-Green (BCG) Economy Model. (Thanyanom, 2019).

6.3 Theoretical Foundations for Sustainable Economic Zone Governance

The sustainable management of economic development zones in Lamphun Province can be explained through several complementary theoretical perspectives.

Sustainable Development Framework

The Sustainable Development framework emphasizes the integration of economic growth, social well-being, and environmental sustainability within long-term development strategies. (Thaptha, et. al., 2024). This approach aligns closely with the United Nations Sustainable Development Goals (SDGs), particularly:

- SDG 8 (Decent Work and Economic Growth),
- SDG 9 (Industry, Innovation and Infrastructure),
- SDG 11 (Sustainable Cities and Communities),
- SDG 12 (Responsible Consumption and Production),
- and SDG 13 (Climate Action).

Triple Bottom Line (TBL)

The Triple Bottom Line framework proposed by John Elkington emphasizes balancing:

- economic performance (Profit),
- social equity (People),
- and environmental sustainability (Planet).

This framework is particularly relevant for industrial estate governance and sustainability-oriented regional development.

Cluster Theory

According to Michael Porter, industrial clustering enhances regional competitiveness through agglomeration economies, innovation spillovers, and integrated supply chains. (United Nations, 2015). Lamphun Province's concentration of electronics and manufacturing industries reflects characteristics of a regional industrial cluster with potential for innovation-driven upgrading.

Multi-level Governance

The Multi-level Governance approach explains the interaction among national, regional, provincial, and local institutions in territorial management. (Vasasiri, Damnet, 2024). This framework is useful for understanding coordination challenges among organizations such as the NESDC, the Northern Economic Corridor (NEC), provincial authorities, and local governments.

6.4 Strategic Analytical Frameworks

The findings from SWOT, TOWS, and PESTEL analyses indicate that Lamphun Province possesses strong industrial and logistical advantages but also faces significant structural and environmental challenges.

SWOT Analysis (Summary)

Dimension	Key Findings
Strengths	Strong electronics manufacturing base and logistics connectivity
Weaknesses	High-skilled labor shortages and environmental infrastructure limitations
Opportunities	BCG policy support and regional investment expansion
Threats	Supply chain volatility, climate risks, and environmental conflicts

Strategic Implications

The analysis suggests several strategic priorities:

- promoting innovation-driven industrial clusters;
- strengthening workforce upskilling and TVET systems;
- improving ESG-oriented environmental governance;
- and establishing integrated one-stop administrative systems to reduce regulatory complexity.

PESTEL Analysis (Summary)

The PESTEL assessment further highlights the importance of:

- national industrial and investment policies,
- demographic aging,
- technological transformation,
- environmental sustainability,
- and regulatory modernization in shaping future development pathways.

6.5 Sustainable Development Indicator Framework

To support long-term monitoring and evaluation, this study proposes a multidimensional sustainability indicator framework integrating economic, social, environmental, and tourism dimensions.

Dimension	Example Indicators
Economic	GPP per capita, labor productivity, FDI inflows
Social	Employment rate, educational attainment, income inequality
Environmental	PM2.5 levels, industrial waste generation, wastewater discharge
Tourism	Tourism revenue, visitor distribution, average length of stay

The proposed framework supports evidence-based territorial governance and sustainability-oriented policy evaluation.

6.6 Implications for Sustainable Spatial Development

Infrastructure, technology, and innovation are not only economic growth drivers but also critical mechanisms for achieving balanced territorial development. (Vorontsova, et. al., 2023). Sustainable economic zone governance in Lamphun Province therefore requires integrated investment in smart infrastructure, digital transformation, environmental management, workforce development, and institutional coordination.

By combining technological upgrading with sustainability-oriented governance frameworks, Lamphun Province can strengthen its transition toward a resilient, innovation-based, and environmentally responsible regional economy within Northern Thailand.

Summary

The sustainable management of strategic economic development zones in Lamphun Province requires an integrated development approach that balances economic growth, social well-being, and environmental sustainability. The findings demonstrate that effective territorial governance depends on

evidence-based policymaking, participatory institutional mechanisms, and coordination among government agencies, local communities, and the private sector.

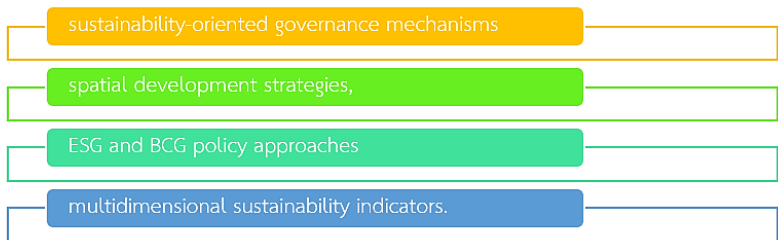
The study highlights Lamphun Province's strong potential as a regional industrial and logistics hub within Northern Thailand, supported by its manufacturing base, strategic location, and infrastructure connectivity. However, the province also faces important structural challenges, including demographic aging, environmental pressures, resource competition, and limitations in governance coordination.

The proposed framework emphasizes the integration of sustainability principles into spatial planning, industrial development, environmental management, and public service systems. Aligning provincial development strategies with the Sustainable Development Goals (SDGs), the Bio-Circular-Green (BCG) Economy Model, and ESG-oriented governance can strengthen regional competitiveness while improving quality of life and safeguarding natural resources over the long term.

The findings also provide policy implications for provincial development planning, sustainable industrial governance, green infrastructure investment, and integrated spatial management applicable to other regions facing similar economic and environmental transitions.

Contributions to New Knowledge

Finally, the study provides a practical analytical framework for provincial-level planning through the integration of:



These contributions may support future policy design, spatial governance reforms, and sustainable regional development planning in both Thailand and comparable territorial contexts.

This study contributes to the field of sustainable territorial governance by proposing an integrated framework for managing provincial-level economic development zones under conditions of rapid industrial transformation and environmental change.

First, the study introduces the concept of culture-based territorial development as a complementary mechanism for sustainable economic growth. The findings demonstrate that

cultural heritage, local identity, and value-based tourism can function as strategic assets that strengthen local economies while supporting social cohesion and environmental conservation.

Second, the study advances a Balanced Territorial Development Framework that integrates economic, social, environmental, and governance dimensions within a unified spatial management approach. Unlike conventional development models focused primarily on economic expansion, this framework emphasizes the interaction between industrial development, quality of life, institutional capacity, and ecological sustainability.

Third, the study highlights the importance of multi-level and multi-actor governance in territorial management. Sustainable development outcomes depend not only on economic policy instruments but also on effective coordination among national agencies, provincial authorities, local governments, communities, and private-sector stakeholders.

Disclosure of Artificial Intelligence (AI) Use

The author used ChatGPT (GPT-5.5, OpenAI) as an AI-powered translation tool during the preparation and editing of this manuscript. The AI tool was used solely to support language

editing, improve expressive clarity, enhance academic writing style, and assist in structuring the manuscript.

The AI tool was not used for data collection, data analysis, interpretation of results, drawing conclusions, or making conclusions. All research design, data analysis, interpretation, and academic judgment were performed solely by the author.

The author has carefully reviewed, verified, and edited the AI-assisted content and assumes full responsibility for the accuracy, completeness, and originality of the manuscript.

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