



Strategic Formulation of Provincial Industry Development Using SWOT-AHP Analysis

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ABSTRACT

The paper aims to conduct the hybrid method combined the SWOT and Analytic Hierarchy Process (AHP) analysis for strategic formulation as well as using the TOWS matrix to identify the set of priority strategies for the industry development of Surin province. The Surin province was chosen as the case study in the research to represent the majority of provinces in Thailand that need appropriate strategic industrial development to stimulate the local economy. This research employed the hybrid method, combining the SWOT analysis to determine significant strengths, weaknesses, opportunities, and threats factors, while the AHP was conducted to prioritize these factors. In the light of the SWOT-AHP results, the TOWS matrix was applied to formulate strategies. Four appropriate strategies were formulated and should be implemented for Surin industrial development, including strengthening agricultural industry competitiveness, promoting productivity in agriculture, promoting and developing essential entrepreneur skills to adapt to COVID-19 situation, and providing accessibility for short- and long-term capital sources to support entrepreneurs.

Keywords: Analytic Hierarchy Process, Industry Development, Strategic Formulation, Surin Province, SWOT Analysis

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Background and Significance of the Research Problem

Thailand is one of the countries that recognizes the important role of industrial development in the growth of a nation. Government agencies were established to be responsible for driving industry development at the national, regional, and provincial levels, such as Ministry of Industry, Industry Promotion Center Region, Office of Industry Economics, Department of Primary Industries and Mines, Provincial Industry Office, etc. In addition, the Thai government has continuously formulated a strategic plan for industry development and related policies, with a target on the enhancement of the country's competitiveness. There are also measures to promote the targeted sectors that help enhance national competitiveness (such as agricultural, industrial, and services sectors), as well as encouragement for research and development, innovation, value creation, and SME development (Thailand Board of Investment, 2021). However, the Thai industry development tends to concentrate on major provinces, while many secondary provinces have a slow rate of industry growth. This is still a great challenge for Thailand, especially during the COVID-19 crisis that caused impacts on the industry development at both the provincial and national levels.

One of the tools used to formulate a provincial industry development strategic plan is the SWOT analysis. Though it is a common tool and has been widely used in industry strategic planning, previous literature has identified the disadvantages and limitations of SWOT. For instance, SWOT relies on the subjective perception of participants who attended the brainstorming session and cannot prioritize the importance of each SWOT factor (Phadermrod, Crowder, & Wills, 2019). It cannot offer an efficient result in practice, and is difficult to use qualitative factors in decision-making and may lead to a wrong decision (Gürel & Tat, 2017). Further, the results of the SWOT analysis may be unreliable and contains biases of the individuals involved in the process. When it comes to the formulation of industry development strategy, it is crucial for province economic growth and sustainability. In this regard, to achieve this goal, the province needs the implementation of appropriate strategies based on systematical identification of those external and internal conditions that favor or hinder the operation.

This paper attempts to examine the combined usage of SWOT analysis and Analytic Hierarchy Process (AHP) as an analytical process for the strategic formulation of the provincial industry development in Thailand. To the best of the authors' knowledge, no research has been conducted on this issue or using this method for the province industry strategic planning in Thailand. This study takes Surin province as a case study that represents the secondary provinces of Thailand. Despite the fact that secondary provinces are the majority provinces of

Thailand, most of their industrial development plays a small role compared to the national level (Regional Development Integrated Policy Committee, 2018). Apart from that, Surin is one of the lower Northeastern provinces group 1, which has set a strategic position to be the center of agricultural industry, food safety, tourism, and border trade. Besides, Surin is the only province in the group with a permanent border crossing point that links logistics and cross-border trade with neighboring country, Cambodia.

Accordingly, in this research, we aim to identify and set priority the appropriate strategy for the industry development of Surin province using the hybrid method combined SWOT and AHP analysis. The AHP analysis is a commonly used method for mitigating the disadvantage of SWOT analysis (Kurttila et al., 2000) and provides reliable analysis results from both quantitative and qualitative methods. The TOWS matrix was also conducted to formulate strategy proposals for industry development of Surin province. The findings contribute not only to policy makers and government agencies involved in Surin's industrial development, but it also provides information for the business sector in terms of the industrial development direction of the province. Further, the method used in this study can be applied to other types of government strategic or action planning to strengthen the results and obtain reliable plans or policies.

Research Objectives

1. To examine the combined usage of SWOT analysis and AHP as an analytical process for the strategic formulation of the provincial industry development.
2. To identify and set priority the appropriate strategy for the industry development of Surin province using the hybrid method combined SWOT and AHP analysis.

Literature Review

SWOT-AHP Analysis and Strategy Formulation

The SWOT analysis first originated in the 1960s by Albert Humphrey to analyze companies in the Fortune 500 to develop a new system of change management and control (Madsen, 2016). Since then, this analysis has been widely applied in many different fields and contexts, such as business, industry, education, health, environment, and agriculture. SWOT stands for strength (S), weakness (W), opportunity (O), and threat (T). These four components derive from the analysis of the environment that the organization exists in, including internal and external environments. The SWOT analysis is a useful tool that has been widely used in many types of organizations for environmental analysis and support for strategic decision situations. It provides an overview of the current and potential scenarios that help an organization to increase

strengths, eliminate or minimize weaknesses, take advantage of opportunities, and prevent threats (Bas, 2013). In addition to its usefulness and ease of analysis, prior studies have identified several limitations of the SWOT analysis. For instance, the utilization of SWOT is mainly based on the qualitative analysis and the capabilities of the persons participating in the planning process without any means of analytically determining the importance of the factors, as well as assessing the decision alternatives to the factors (Kangas et al., 2001). The SWOT analysis presents a superficial and imprecise list of factors that rely on the subjective perception of individuals participating in the SWOT brainstorming session, as well as its lack of prioritization of important SWOT factors (Phadermrod, Crowder, & Wills, 2019).

The AHP is a multicriteria decision-making approach in which factors are arranged in a hierarchic structure (Saaty, 1990), and a decision is made based on the importance of factors. The hierarchy structure presents a complicated issue in a multi-structure level that the first level is the goal or objective, the next level is the factors, criteria, sub-criteria, and the last level of alternatives. Kurttila et al. (2000) addressed the importance of a hybrid method using the AHP to combine with SWOT. The utilization of the AHP within the SWOT framework aims to systematically prioritize SWOT factors by performing pair-wise comparisons between factors and analyzing them through the eigenvalue technique as applied in the AHP (Wickramasinghe & Takano, 2009). In other words, this hybrid method provides a basic framework for decision-making based on the SWOT analysis, while the AHP provides the quantitative results to improve the decision-making framework. In this study, the SWOT-AHP method is used to prioritize the internal and external factors in the SWOT model before formulating possible strategies for the industrial development of Surin province in the form of TOWS matrix.

The TOWS matrix, or situational analysis, was developed by Wehrich (1982) by combining the external environment (threats and opportunities) and the internal environment (weaknesses and strengths) resulting from the SWOT analysis. TOWS is simply “SWOT” spelled backward, and it aims to provide a SWOT analysis application. The TOWS matrix is a common instrument that is widely used with SWOT analysis in the strategic planning of organizations in various types, sectors, and sizes. Ravanavar & Charantimath (2012) added that without the extension to the TOWS matrix, the SWOT analysis becomes a useless exercise. This is because the TOWS matrix allows more in-depth analysis to interpret the results of SWOT analysis into alternative strategies. The strategy is formulated by identifying the strengths that are used to capitalize on opportunities and to counter threats, and the weaknesses that need to be minimized by using opportunities, as well as avoiding both weaknesses and threats.

Provincial Industry Development

According to the Cabinet Resolution on 4 December 2017, the government plans of Thailand are classified into 3 levels, including 1) the 20-Year National Strategy (2018-2037) 2) the 12th National Economic and Social Development Plan, the Master Plan under the National Strategy, and 3) the government organization action plan. Thailand has the 20-Year National Strategy (2018-2037) as the first national strategy according to the Constitution of the Kingdom of Thailand, intending to develop the country to achieve this vision: “Thailand is stable, prosperous, and sustainable, based on the philosophy of sufficiency economy development.” Under this strategy, there are the National Economic and Social Development Plan and the Master Plan that emphasize the development aspects of a country. All these plans have been passed on to government organizations at all levels to convey goals and indicators to the operation of the organization systematically.

The industry sector is the main driving force for the Thai economy in creating added value and employment. However, in the past years, the industry growth has slowed down due to the limitation of competitiveness of the Thai industry sector in creating added value per capita and the intensity of technology utilization in comparison with other countries in the region (Kiatrueangkrai, Thepkham, & Chinwonwatthana, 2020). Apart from changing slowly, the Thai industrial sector is still driven by the same industry, and concentrated in the same area. As a result, the transformation of the country’s industry to industry 4.0 has become the focus of Thailand’s National Strategic Plan. The Ministry of Industry is responsible for promoting and developing the industrial sector of Thailand. Nevertheless, the strength of the country’s economy as a whole cannot be understood without the contribution of all provinces. Therefore, the provincial industry offices were established under the Ministry of Industry and are located in every province of Thailand to operate the province’s industry promotion and development. They play a central administrative and guidance role in all development dimensions of their territory industry. These offices have to formulate a strategic plan for their provinces’ industry development and implement the plans under the Ministry’s industry strategic plan. Since provinces vary in size, population, resources, and social contexts, the formulation of each province’s development strategic plans needs to be systematically analyzed to comply with their contexts and the current dynamic environment.

This study focuses on Surin province as a case study that represents a secondary province of Thailand. The province is among the ten pilot provinces with the lowest household incomes and is under the project to solve poverty problems completely and sustainably, according to the Office of National Higher Education Science Research and Innovation Policy Council in the

Year 2020. The province is also a member of the lower Northeastern provinces group 1, where the group has set a strategic position to be the center of agricultural industry, food safety, tourism, and border trade. Surin has a permanent border crossing linked to Cambodia and is a well-known area for producing rice, livestock, and agricultural products. 82.75% of the province's industrial factories are small factories. The province's industrial sectors with the highest investments are biomass power generation, stone mills, and sand vacuum plants. We employ the management tool that combines SWOT and AHP analysis, aiming to formulate strategies based on those factors in the form of TOWS matrix.

Research Methodology

The participants in this study were designed to get the perspectives of policymakers and people who are the stakeholders in the policy implementation of Surin industrial development. There were 26 experts, all of whom were selected according to the recommendation by the Provincial Industry Office of Surin province to represent a diverse set of stakeholders' perspectives. Basically, provincial strategic planning requires representatives from key provincial government agencies and other stakeholders (such as educational institutions, businesses, etc.) to participate in the process. In this study, the vast majority of the participants were 13 members of local government with knowledge and experience in local development. Others are 3 representatives from local businesses, 5 from businesses and industry associations, 3 researchers, and 2 university members.

The SWOT factors relating to the development of Surin's industry were identified using focus group discussions and literature reviews. Secondary data on SWOT factors were collected from relevant documents, particularly industrial development strategic plans at the provincial, regional, and national levels. After that, we conducted a focus group session with experts to review and confirm SWOT factors relating to the development of the Surin industry. They were also asked to compare SWOT factors in pairwise comparisons. This study conducted the analysis process that combined the SWOT and AHP analysis so that the SWOT factors could not only be the linguistic data (Saaty, 2005; Kurtilla et al., 2000) but also be carried out more analytically based on the quantitative information basis of strategic planning processes (Kangas et.al., 2001). The analysis process consisted of the following steps;

1. Conducted a SWOT analysis to identify strengths (S), weaknesses (W), opportunities (O), and threats (T) of Surin industry development.
2. Established the hierarchical structure of the study to present the relationships of hierarchical dependence between SWOT group, sub-criteria, and strategic decisions.

3. Paired comparisons between SWOT factors within each SWOT group, with judgments of experts, were performed to compare and identify preference factors. After that, the AHP analysis was conducted to transform the preference factors to a numerical value according to Saaty's scale (1980). Experts compared two factors with respect to the objective of the study (development of the industry plan). Each comparison included ranking on a scale of 1 to 9 (Saaty scale) to make relative judgment factors as shown in Table 1.

Table 1 Comparison Scale of Saaty

Scale	Definition
1	The first attribute is equally important to the second attribute.
3	The first attribute is a little more important than the second attribute.
5	The first attribute is more important than the second attribute.
7	The first attribute is very important more than the second attribute.
9	The first attribute is extremely more important than the second attribute.
2, 4, 6, 8	Intermediate values.

Source: Saaty (1990)

4. Calculated a list of the relative weights, or importance of the SWOT factors using the method of eigenvalues (Saaty, 1980). A consistency index (CI) by Saaty (1980) was performed to check the consistency of the judgments and can be calculated by the following equation;

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

5. Calculated a list of the relative weights, or importance of the SWOT factors using the method of eigenvalues (Saaty, 1980). A consistency index (CI) by Saaty (1980) was performed to check the consistency of the judgments and can be calculated by the following equation;

$$CR = \frac{CI}{RI}$$

The value of CR that is smaller or equal to 0.1 is considered to be the acceptable inconsistency. However, if the CR value is ≥ 0.10 , the ratio indicates the inconsistent judgments

6. Developed possible strategies using TOWS matrix that drew four possible strategies based on results from step 3, including SO-strategies, WO-strategies, ST-strategies, and WT-strategies.

Results

The Determination of SWOT Factors

This study determines the SWOT factors of the Surin industry development from the existing literature available and documents related to Surin strategic and industrial development plan, as well as brainstorming through a meeting session with participants. The results of the strengths, weaknesses, opportunities, and threats are present in Table 2.

Table 2 SWOT analysis for Surin industry development (author's compilation)

Strengths (S)	Opportunities (O)
S1 Important areas for producing crops and livestock of Thailand.	O1 Consumers are more alert and want safer and more organic products.
S2 Several industry factories produce a wide variety of products and able to utilize agricultural raw materials.	O2 Thai products and services are in high demand in the neighboring countries.
S3 Province identity products can generate good income, such as silk, silver, and brass.	O3 Government policy in promoting the tourism and agriculture industry in line with the province's identity.
S4 Unique resources can be leveraged in product development and the tourism industry.	O4 Government policy in building capacity for SMEs and promoting access to capital source.
S5 A wide variety of local wisdom in agriculture and the production of local products.	O5 Government policy in promoting crossed border trade and investment.
	O6 Government policy in promoting SMEs' potential through the use of technology and innovation.
Weaknesses (W)	Threats (T)
W1 SME has an adaptation limit in the COVID-19 crisis situation.	T1 Insufficiency of water supply for agriculture and consumption.
W2 Conditions for access to funding are unfavorable for SMEs.	T2 COVID-19 crisis.
W3 Workers' skills are inconsistent with industry needs.	T3 Climate change and natural disasters that affect agricultural productivity.
W4 Technology, innovation, and research are not widely used to produce and add product values.	T4 The uncertainty of the macro and micro economy.
W5 Raw materials for industry production are not enough.	T5 The uncertain price of agricultural products affecting the planning of cultivation.

Hierarchical Structure

The hierarchy structure was established to present the relationships of hierarchical dependence between SWOT groups, sub-criteria, and strategic decisions, as shown in Figure 1. The first level presents the objective of the research that aims to formulate strategic decisions on the industry development of Surin province. The second level constructs the decision criteria that consist of the SWOT group; strength (S), weakness (W), opportunity (O), and threat (T). The third level presents the decision sub-criteria of each SWOT group, while the fourth level illustrates the strategic decisions.

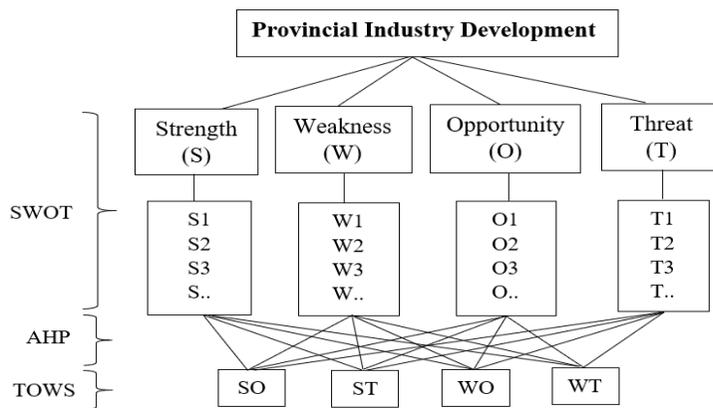


Figure 1 The hierarchical structure model (authors' compilation)

Pair Wise Comparison

The local and global priorities of SWOT factors were calculated, and the results are illustrated in Table 3. Local priority scores are the relative priorities of the factors in each SWOT category when compared with each other, while global priority scores represent the relative priority scores of each category, determined by making comparisons between the factors in each category with the highest priority (Stainback, Masozera, Mukuralinda, & Dwivedi, 2012). With regard to the overall relative weight of factors, the highest relative weight is related to strengths (0.273), followed by threats (0.266), opportunities (0.236), and weakness (0.224), respectively. These results show that the most important criterion for the development of the Surin industry is strength. It shows that there are many strengths for the industry, as it indicates that the opinions of none of the experts contradicted each other. The inconsistency ratio (IR) for each of the comparisons is less than 0.1. In addition, among the strength factors, S1 (important areas for producing crops and livestock in Thailand) is the strongest factor, with values of 0.321 (local priority) and 0.088 (global priority). The W1 (SMEs have an adaptation limit in the COVID-19 crisis situation) is the weakest factor in the weakness group, with a local priority of 0.286 and a global priority of 0.064). O1 (consumers are more alert and want safer foods) and 0.067 (global priority).

And, T1 (insufficiency of water supply for agriculture and consumption) is the most and more organic products constitute the top priority among the opportunity group with values of 0.284 (local priority) threatening factor in the threat group with values of 0.299 (local priority) and 0.080 (global priority).

Table 3 Priorities of Comparisons of the SWOT Groups and Factors

SWOT Group	Group Weight score	Priority	SWOT factors	Local weight score	Global priority (Overall weight score)
Strengths	0.273	1	S1	0.321	0.088
			S2	0.218	0.060
			S3	0.158	0.043
			S4	0.152	0.041
			S5	0.152	0.041
Consistency ratio relative to the goal: CR = 0.013					
Weaknesses	0.224	4	W1	0.286	0.064
			W2	0.190	0.043
			W4	0.182	0.041
			W3	0.176	0.039
			W5	0.165	0.037
Consistency ratio relative to the goal: CR = 0.074					
Opportunities	0.236	3	O1	0.284	0.067
			O2	0.178	0.042
			O3	0.157	0.037
			O4	0.142	0.034
			O5	0.132	0.031
			O6	0.107	0.025
Consistency ratio relative to the goal: CR = 0.035					
Threats	0.266	2	T1	0.299	0.080
			T2	0.290	0.077
			T3	0.155	0.041
			T4	0.147	0.039
			T5	0.109	0.029
Consistency ratio relative to the goal: CR = 0.067					

Note: Local weight scores indicate the level of priority with respect to each SWOT groups. The greatest weight score within the SWOT group in boldface. Overall weight scores are calculated by multiplying the local weight score within the SWOT group by the group weight score. For example, the overall weight score of S.1 is $0.273 \times 0.321 = 0.088$

Strategy Formulation Using TOWS Matrix

The TOWS analysis has been employed for strategy formulation to transform current environmental conditions into desired situations for the industrial development of Surin province. According to the TOWS matrix, industrial development strategies can be developed based on the identification of strengths, weaknesses, opportunities, and threats. The first three prioritized factors of all SWOT groups were listed and taken into consideration based on the result of the SWOT-AHP analysis. Four different combinations of strengths, weaknesses, opportunities, and threats are identified as SO, WO, ST, and WT strategies as presented in Table 4.

Table 4 TOWS Matrix of Surin Industrial Development Strategies

	Strengths	Weaknesses
Opportunities	SO strategy	WO strategy
	Strengthen the competitiveness of the agricultural industry. (S1 S2 S3/O1 O2 O3)	Promote and develop essential skills of SMEs to adapt in the COVID situation. (W1/O1 O3)
Threats	ST strategy	WT strategy
	Promote productivity in agriculture that uses less water, especially livestock. (S1 S2 S3/T1 T2 T3)	Provide supports for entrepreneurs to get access to sources of short- and long-term capital. (W1 W2 W4/T1 T2 T3)

Discussion

The present study intends to propose the strategic formulation of a province's industrial development using a systematic method that combines the SWOT analysis and AHP analysis. This method employs the AHP analysis to complement the weaknesses of SWOT analysis regarding its lack of quantitatively determining the importance of factors. The results showed the prioritized factor of each SWOT dimension. The most important aspects of each SWOT dimension consist of S1: important areas for producing crops and livestock in Thailand, W1: SME has an adaptation limit in the COVID-19 crisis situation, O1: consumers are more alert and want safer and more organic products, and T1: insufficiency of water supply for agriculture and consumption. The TOWS matrix was employed to formulate the strategies based on the SWOT-AHP results. Four strategies were proposed, including the SO strategy, that focuses on strengthening

the competitiveness of the agricultural industry to be able to produce standard, safe, and organic agricultural products. The results follow Fafurida, Setiawan, & Irmawati (2016), who recommended that in order to increase the competitiveness of a province industry, it is necessary for the government to formulate a strategy that focuses on the development of leading industries, maintains the performance of leading industries that already have competitiveness, and provides support to less competitive industries to help them achieve competitiveness in the future. Liu, Lee, & Lee (2020) added that industrial sectors should respond rapidly to the changing market by building on the strength of their own particular characteristics.

The ST strategy for the industrial development of Surin is to maximize and leverage the strengths to minimize the threats. This study proposes that the province needs to promote productivity in agriculture that uses less water, especially in livestock. Furthermore, the Surin industry office must support the efficient management of industrial water resources, collaborate with relevant sectors to jointly plan for long-term water resource utilization, and promote environmentally friendly industry operations. In this regard, Hoang Thanh et al. (2018) found that regular training and promotion in science and technology by relevant agencies resulted in increasing agricultural productivity of farmers, as well as quality and safe production processes. This would also enhance the self-reliance, creativity, and capability of local people.

Furthermore, we proposed the WO strategy to minimize the weaknesses and maximize the opportunities. We propose the WO strategy for the Surin Provincial Industry Office to promote and develop the essential skills of entrepreneurs to help them adapt to the new context. Crises from COVID-19 have led entrepreneurs to confront challenges and threats. It is necessary to develop entrepreneurial competencies and the necessary skills to adapt to the new working environment and prepare citizens to develop resilience in businesses (European Commission, 2020). For instance, the development of technology skills in production and online-marketing. The strategy includes providing them access to assistance during the COVID-19 crisis, as well as promoting the use of technology and innovation for entrepreneurs to develop safe/organic product standards in line with market demands. Zin & Ibrahim (2020) confirmed this strategy and added that any entrepreneurship intervention programs should be designed to the specific module and local requirements, sensitive to the entrepreneurs' needs and expectations, as well as places an emphasis on continuity and comprehensive of the program.

Finally, the WT strategy was proposed to minimize both the weaknesses and threats. The WT strategy we propose for the Surin Provincial Industry Office is to assist entrepreneurs in obtaining short- and long-term financial capital from a variety of sources. This would allow businesses that were affected by the COVID-19 crisis to be able to continue doing business, as well as provide a platform for potential businesses to develop and grow faster. In the meantime, to overcome weaknesses and avoid threats, entrepreneurs should have access to other types of capital in order to continuously improve or develop their products based on market changes. Local entrepreneurs may not know how to access the sources of capital they need. Government agencies, therefore, need to take into account proactive communication to target groups and provide channels with easy access. The proposed strategy is in line with Liu, Lee, & Lee (2020) that small businesses should maximize the effects of various rescue packages during the current COVID-19 crisis issued by the government. Further, despite the resource constraints of local government, Roundy (2017) addressed that it can be an advantage in terms of having more flexible decision-making and easily changing unproductive projects and programs.

Suggestions and Conclusion

This study reported that the most significant SWOT factor for industrial development is the strength of Surin in terms of being an important area for producing crops and livestock in Thailand. Followed by the threat comes from having an insufficiency of water supply for agriculture and consumption, the weakness from the limitation of SMEs' ability to adapt to the COVID-19 crisis, and the opportunity derives from consumers' alertness and demand for safer and more organic products, respectively. Based on the results of the study, we proposed the industry development strategies of Surin from a practical viewpoint, and they focus on the leading industry, increased productivity, human capital, and access to needed support. The strategies include 'strengthening the competitiveness of the agricultural industry', 'promoting productivity in agriculture that uses less water, especially livestock', promoting and developing essential skills of entrepreneurs to adapt in the new context', as well as providing supports for entrepreneurs to get access to various sources of short- and long-term capital.

We recommend that the industrial development strategy be an important starting point for the economic development of every province in Thailand. Therefore, provincial administrators must focus on the industrial development of the province by promoting and supporting relevant local government agencies to work together in accordance with the strategic plan, as well as vigorously assessing and monitoring results to ensure the effective implementation

of the plan. Furthermore, business sectors and entrepreneurs need to be involved and be aware of the industrial development direction of their provinces. This paper has limitations in terms of the focus being only on the industrial development strategies of one Surin province. The results may limit the implications of the research findings to other provinces where there are differences in provincial contexts. Therefore, future research can be carried out in other provinces, as well as comparative studies can be done across countries that need to formulate strategic development plans.

References

- Albrechts, L. & Balducci, A. (2013). Practicing strategic planning: in search of critical features to explain the strategic character of plans. *disP—the Planning Review*, 49(3), 16–27.
- Bas, E. (2013). The integrated framework for analysis of electricity supply chain using an integrated SWOT-fuzzy TOPSIS methodology combined with AHP: The case of Turkey. *International Journal of Electrical Power & Energy Systems*, 44(1), 897–907.
- Brain, R. (2014). *Managing systems of secondary cities, policy responses in international development*; Cities Alliance: Washington, DC, USA.
- Bryson, J. M. (2011). *Strategic planning for public and nonprofit organizations*. San Francisco, CA: Jossey-Bass.
- European Commission. (2020). *Commission presents European skills agenda for sustainable competitiveness, social fairness, and resilience*. Retrieved from <https://bit.ly/3zIAfcW>
- Fafurida, F., Setiawan, A. B., & Irmawati, S. (2016). A Strategy to increase the competitiveness of leading industries in Central Java province to face ASEAN Economics Community 2015. *International Journal of Economics and Financial Issues*, 6(6), 60-66.
- Gürel, E. & Tat, M. (2017). SWOT analysis: A theoretical review. *Journal of International Social Research*, 10(51), 1145-1154.
- Hoang Thanh, L., Ta Nhat, L., Nguyen Dang, H., Ho, T. M. H., & Lebailly, P. (2018). One Village One Product (OVOP)-A rural development strategy and the early adaption in Vietnam, the case of Quang Ninh Province. *Sustainability*, 10(12), 4485.
- Kangas, J. Pesonen, M. Kurttila, M., & Kajanus, M. (2001). A'WOT: Integrating the AHP with SWOT analysis, *The International Symposium on the Analytic Hierarchy Process 2001*, Berne, Switzerland, 189-198.

- Kiatrueangkrai, C., Thepkham, P., & Chinwonwatthana, W. (2020). *10 pi utsahakam Thai rao ma klai khae nai. Focused and Quick (FAQ)*. 165 (April 29, 2020), Bank of Thailand. [In Thai]
- Kurttila, M., Pesonena, M., Kangasb, J., & Kajanusa, M. (2000). Utilizing the Analytic Hierarchy Process (AHP) in SWOT analysis-a hybrid method and its application to a forestcertification case. *Forest Policy and Economics*, 1(1), 41-52.
- Lenis Escobar, A., Rueda López, R., García Guerrero, J. E., & Salinas Cuadrado, E. (2020). Design of strategies for the implementation and management of a complementary monetary system using the SWOT-AHP methodology. *Sustainability*, 12(17), 6849.
- Liu, Y., Lee, J. M., & Lee, C. (2020). The challenges and opportunities of a global health crisis: the management and business implications of COVID-19 from an Asian perspective. *Asian Business & Management*, 1.
- Madsen, D. Ø. (2016). SWOT analysis: A management fashion perspective. *International Journal of Business Research*, 16(1), 39-56.
- Muzahidul, M., Akter, L., Pervez, A. K., Nabi, M. N., Uddin, M. M., & Arifin, Z. (2020). Application of combined SWOT and AHP for strategy development: Evidence from pottery industry of Bangladesh. *Asian Journal of Agriculture and Rural Development*, 10(1), 81-94.
- Osuna, E.E. & Aranda, A. (2007). Combining SWOT and AHP techniques for strategic planning. *The International Symposium on the Analytic Hierarchy Process 2007*, Viña del Mar, Chile, August 2-6, 2007.
- Phadermrod, B., Crowder, R. M., & Wills, G. B. (2019). Importance-performance analysis based SWOT analysis. *International Journal of Information Management*, 44, 194-203.
- Ravanavar, G. M. & Charantimath, P. M. (2012). Strategic formulation using tows matrix-A case study. *International Journal of Research and Development*, 1(1), 87-90.
- Regional Development Integrated Policy Committee. (2018). *Northeastern development plan*. Retrieved from <https://bit.ly/357N1rk>
- Rondinelli, D. A. (1983). Dynamics of growth of secondary cities in developing countries. *Geographical Review*, 42-57.
- Roundy, P. T. (2017). "Small town" entrepreneurial ecosystems: Implications for developed and emerging economies. *Journal of Entrepreneurship in Emerging Economies*, 9(3), 238-262.

- Saaty, T. L. (1990). How to make a decision: the analytic hierarchy process. *European Journal of Operational Research*, 48(1), 9-26.
- _____. (2005). *Theory and applications of the analytic network process*, Pittsburgh, PA: RWS Publications.
- Saaty, T. L. & Vargas, L. G. (1980). Hierarchical analysis of behavior in competition: Prediction in chess. *Behavioral Science*, 25(3), 180-191.
- Song, L. (2013). *Southeast Asian secondary cities: Frontiers of opportunity and challenges*. MIT, community innovators lab (CoLab): Cambridge, MA, USA, 2013.
- Stainback, G. A., Masozera, M., Mukuralinda, A., & Dwivedi, P. (2012). Smallholder agroforestry in Rwanda: A SWOT-AHP analysis. *Small-scale Forestry*, 11(3), 285-300.
- Thailand Board of Investment. (2021). *A guide to the Board of Investment 2021*. The Office of the Board of Investment.
- Wehrich, H. (1982). The TOWS matrix - A tool for situational analysis. *Long Range Planning*, 15(2), 54-66.
- Wickramasinghe, V. S. K. & Takano, S. E. (2009). Application of combined SWOT and Analytic Hierarchy Process (AHP) for tourism revival strategic marketing planning. In *Proceedings of the Eastern Asia Society for Transportation Studies*, 7, 189-189.
- Zin, M. L. M. & Ibrahim, H. (2020). The influence of entrepreneurial supports on business performance among rural entrepreneurs. *Annals of Contemporary Developments in Management & HR*, Print ISSN, 2632-7686.