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# Development of the Strategic Framework for Sustainable Development of the Special Economic Zones in ASEAN Economic Community: A Case Study of Savannakhet - Mukdahan

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**Abstract**

The study proposes a strategic sustainable development (SD) framework for the special economic zones in the ASEAN Economic Community (AEC) by investigating 11 key factors to the success of SD, using the concepts of Strategic Environment Assessment (SEA) and Sustainability Assessment (SA). The key factors are 1) public education, 2) educational system, 3) international SD standard, 4) policy, 5) management structure, 6) environmental management, 7) zoning, 8) expenditure, 9) public participation, 10) public health and 11) local business protection. The study use qualitative methods including a literature review as well as collection of primary data through a semi-structured interview form by face-to-face in-depth interviewing with 56 stakeholders selected through the triangulation and appreciative inquiry techniques. The data were qualitatively analyzed to present opinions, problems, needs and results according to SEA and SA. Using content analysis, an analysis was conducted of the state of SD in the target areas of Mukdahan and Savannakhet special economic zones. A strategic SD framework was designed for use in the AEC region. The study recommends further investigation of key factors to identify those that may be specific to each area.

**Keywords:** Sustainable development; Strategic environmental assessment; Sustainability appraisal; Special economic zone; Strategic framework for sustainable development

## Introduction

In 1998, the Greater Mekong sub-region (GMS) initiated the East West Economic Corridor (EWEC) project to develop logistic routes linking the Andaman Sea to the Vietnamese coast at Da Nang, Vietnam. This led to GMS members launching a number of development projects along EWEC routes [1]. These included the establishment in 2003 by the Laos National Committee for Special Economic Zone (LNSEZ) of the Savan-SENO Special Economic Zone (SSEZ) in Savannakhet province of the Lao People's Democratic Republic (Lao PDR), on the right wing of the EWEC project, which has attracted significant foreign investment [11]. Likewise, the government of Thailand through its Cabinet Resolution of 22/02/2004, set up the Mukdahan Special Economic Zone (MSEZ) in the country's northeastern Mukdahan province bordering Lao PDR. Both projects are located next to each other and along Route 9 or R9, the main EWEC logistic route, which starts from Myan-mar's western Mawlamyine province, passing through Thailand's Tak Province to Mukdahan, entering Laos at Savannakhet, then crossing into Vietnam's Quang Tri Province before ending at Da Nang. Route 9 has become an important strategic route, with governments of these four countries initiating special economic zones along the route.

According to the Japan External Trade Organization (JETRO), the special economic zones have significantly boosted economic activity [11]. Over US$ 1 billion invested in the SSEZ that boosted economic growth, promoted rural area development and generated jobs. About 300 companies with a total registered capital of almost US$ 8 billion have been set up in SSEZ and approximately 15,000 jobs created in the zone, with its export-import value reaching US$ 352 million and US$ 1.115 billion, respectively [33].

The MSEZ has also stimulated economic growth within the zone, benefiting from its natural and human resource potential, according to the Office of Industrial Economics of Thailand (OIE) [22]. The Board of Investment of Thailand (BOI) stated in its announcement NO.19/2015 that the "local government listed that MSEZ would be underlined as the main activities in the zone" [2]. The MSEZ has attracted foreign investment of US$ 126 million [22].

However, a research investigation by the Royal Thai Consulate-General in Savannakhet found that social and environmental issues in both SSEZ and MSEZ tended to attract less attention than issues relating to economic growth. It was said that MSEZ and the SSEZ have resulted in negative social and environmental impacts as both SSEZ and MSEZ lack adequate proper maintenance and appropriate management [30]. One scholar, Mr. Supaluk, reported that the damaged road surface in Savankhet resulted in risk to transport from accidents, damage to goods, waste, dirt, chemical spills and air pollution, affecting both travellers and local communities [28]. As the United Nations has noted, while economic activity improves the living standards of some, it can also result in ecological degradation, affecting the prospects for long-term sustainability [24].

The international community has long reached a broad consensus that a development project without a Sustainable development plan is not viable. Accordingly, approaches such as Strategic Environmental Assessment (SEA) and Sustainability Appraisal (SA) are used to help integrate SD issues into policies, plans and programs (PPPs) [19]. For example, the European Union implements SEA and SA in its development plans and has issued a SEA Directive (2001/ 42/EC). The United Nations Economic Commission of Europe (UNECE)

SEA protocol 2003 offers another good example.

This study aims to find out how SEA and SA can be used to promote SD in both special economic zones in Lao PDR and Thailand. The objectives of the study are 1) to investigate the key success factors of SD for the SSEZ and MSEZ and 2) to develop the strategic SD framework for Special Economic Zones in the ASEAN Economic Community (AEC).

## Literature review

### 1) Strategic environmental assessment (SEA)

The SEA approach is increasingly used. Its application varies in process, methodology and practice according to the specific institutional context. The broad objective of a SEA is to ensure that key environmental issues are incorporated into the decision-making processes of PPPs [19]. A SEA addresses the limitations of Environmental Impact Assessment (EIA) which is traditionally used for specific projects and activities [19]. The SEA became the international standard under the European Union SEA Directive (2001/42/EC) and the United Nations Economic Commission of Europe SEA protocol 2003, which made its application mandatory for all EU members. For example, the Board of the Portuguese Environmental Agency (BPEA) implemented the SEA standard and issued guidelines to relevant agencies. A BPEA statement noted that the SEA was a decision support instrument that strengthened social commitments to SD, and contributed to more efficient resource management and a green economy. The Portuguese government has requested all municipal governments to integrate SEA into their plans and programs, including municipal master plans and strategic frameworks [27]. The Government of the United Kingdom has also integrated SEA into municipal development plans. In 2000, the Environmental Protection Department of the Hong Kong Government, applied the SEA procedure to the second railway development project with three recommendations: 1) Fully consider the hidden environmental benefits; 2) Increase rail distance from 34 % to almost 60 % of total transport by 2016, with an estimated annual reduction in air pollutants equivalent to about 600 tons of $NO_x$ and respiratory suspended particulates, and 160,000 tons of CO2 equivalent; and 3) eliminate environmentally unacceptable alternatives [8]. Accordingly, SEA has been used as a tool to promote sustainable development in a number of developed nations. Many projects have applied SEA to integrate social and environmental issues into policy making and planning.

This study will apply SEA for the following two purposes: 1) to prepare the format of a semi-structured interview form; 2) applying SEA processes to the strategic SD framework. The application of SEA will bring the framework to international standards.

### 2) Sustainability appraisal (SA)

In general, an SA is used to incorporate sustainability concerns into policy making processes. It is a compulsory requirement within the European Union under the 2004 Planning and Compulsory Purchase Act and the 2001/42/EC European Directive. Likewise, the Town and Country Planning Act of the United Kingdom states that a SA is an assessment of the economic, environmental and social effects of a plan that begins from the preparatory stage to ensure that decisions are in keeping with SD concerns [32]. However, in practice, SA has focused more on the social dimension of SD. There are a number of cases worldwide of SA use in planning and policy making. For example, local authority of Kirklees County in the United Kingdom, applied SA preparing its Local Plan. The application of SA has helped to define sustainability baselines and development status such as the rate of employment,

condition of the economy, public health, education and law and order, among others [14]. The use of SA in preparing the development plan for Bracknell Forest Borough, UK, acted as an organizational umbrella covering and indicating all tasks of each stakeholder. It defined the objectives and issues that needed to be addressed [4]. As in these cases, this study will use SA as a tool to strengthen social development in the strategic SD framework.

**3) Strategy map**

A strategy map is a visual tool designed for effective implementation of a strategic organizational management plan to achieve development goals. According to its developers, Robert Kaplan and David Norton, the strategy map plays an important role in ensure that policies cover all four essential dimensions of SD. The four perspectives are 1) learning and growth; 2) internal; 3) financial; and 4) stakeholders. According to Kaplan and Norton, these perspectives cover all key aspects of SD for development projects [13]. Accordingly, this study will apply the strategy map to the proposed framework to categorize and prioritize SD factors. Furthermore, the strategy map can also ensure effective management of the strategic framework general.

**4) ISO 26000**

The ISO 26000 Standard, developed by the International Organization for Standardization (ISO) with the support of more than 400 SD experts and 200 observers from 99 countries in 2010 [3], provides SD guidelines and indicators. ISO insists that the standard is flexible and suitable for all organizations. It has seven categories: 1) governance, 2) human rights, 3) labour practice, 4) environment, 5) fair operating practice, 6) consumer issues and 7) community development. This study will use these categories as filters to categorize and evaluate initiatives in the proposed strategic SD framework. Moreover, the application of ISO 26000 will make the proposed framework standards compliant with international norms as more than 160 countries have implemented this standard.

**5) The Global Reporting Initiative version G4 (GRI)**

The Global Reporting Initiative (GRI) is a globally recognized and widely adopted SD standard. For example, the USA, the European Union, Scandinavian nations, Japan, Hong Kong SAR and Thailand all use the GRI sustainability guidelines and assessment criteria. The standard has 20 sub-aspects; 1) economic performance, 2) market presence, 3) indirect economic impacts, 4) procurement practices, 5) materials, 6) energy, 7) water, 8) biodiversity, 9) emissions, 10) effluents and waste, 11) products and services, 12) compliance, 13) transport, 14) overall, 15) supplier environmental assessment, 16) environmental grievance mecharisms, 17) labor practices and decent work, 18) human rights, 19) society and 20) social responsibility. These categories combine 58 management disclosures and 91 indicators. As GRI covers more areas than ISO 26000, this study applies GRI to the proposed framework as the second filter and uses it as a sustainability guideline for initiatives in the framework. Furthermore, GRI criteria will be used as a key performance indicator (KPI) to assess all activities in the proposed framework.

**Methodology**

**1) Conceptual framework**

Figure 1 explains the structure of the study which will involve several stages. As shown in Box 1, the study begins with a documentation review of the SD, SEA, SA, the strategy map, special economic zones and international SD standards to determine the research direction and to set up three main outputs which are listed Boxes 2 to 4. Box 2 shows the output generated

from semi-structured interviews with selected key informants by using the interview form designed to investigate SD key success factors through face-to-face, in-depth interviews with selected key informants. Box 3 shows the output generated by the extraction of SEA, SA and strategy map elements, which will be used to construct the framework. Box 4 shows this output as the study result of international SD standards that helps in better understanding the standards. The study then shows these results to key informants and asks if they agree with these or not. The findings confirmed by the key informants will be the knowledge contribution of this study. Box5 combines results of Boxes 2 and 3 to establish the "Strategic Planning" body of the framework. Then, as Box 6 shows, the outputs of Boxes 2 and 4 are integrated as the "Sustainability Assessment" body of the framework. Finally, Box 7 shows the study integrating the "Strategic Planning" and "Sustainability Assessment" bodies together to establish the strategic SD framework for the AEC special economic zones.

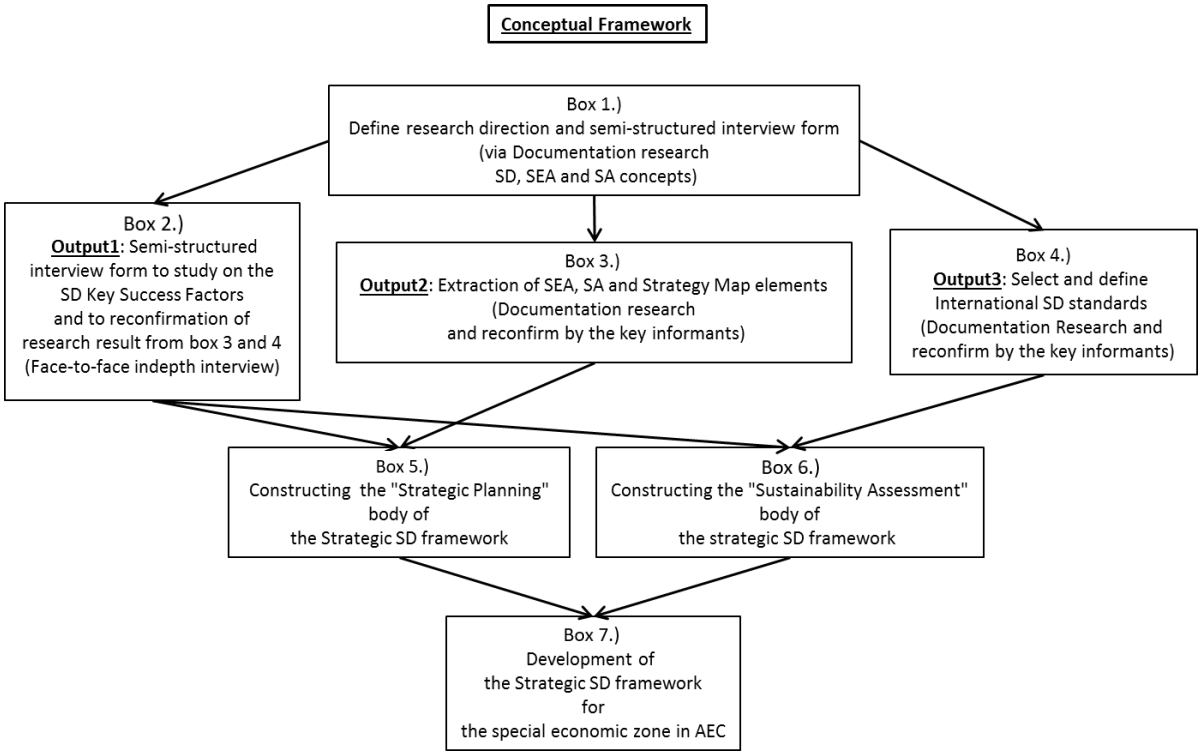


**Figure 1** Conceptual framework.

**2) Techniques and tools**

2.1) Techniques

The study used qualitative methods. Participation processes were used to gain information about stakeholders throughout the study processes. The study collected secondary and primary data including the following:

- Secondary data through documentation reviews, together with a check list form to collect government policy documents, relevant international reports and special economic zone development reports to obtain information relevant to SD, SEA, SA and the specific background of special economic zone development which was finally used as part of interview form for the study. The study also reviewed international SD standard documents to compile information of latest developments in international SD standards. This helped in designing the semi-structured interview form.

• Primary data through face-to-face, in-depth interviews of relevant key stakeholders, on the current status of SD in the research areas, key SD success factors and an understanding of the development processes that would support development of the strategic SD framework.

• Triangulation analysis was used to ensure that the study would get useful results from different perspectives. Moreover, use of the appreciative inquiry technique ensured selection of appropriate key informants from different sectors including governmental agencies, non-governmental organizations and the community.

2.2) Tools

Besides the literature review, several tools were used, as follows:

• A semi-structured interview form was designed from a literature review, case studies and developed by content validity (IOC) with professionals of SD, SEA and SA. Semi-structured interviews were conducted with key informants using questions such as: "What are the key success factors that can deliver sustainable development in Savannakhet - Mukdahan special economic zones?"; "What aspects should be considered as potential components of the strategic framework?"; "What are the difficulties of setting up SD in the study areas?" and some other general questions such as "What are the main environmental and social problems?".

• Stakeholder identification was used to identify target groups for the study, relying mainly on balancing numbers of key informants from three sectors. Key informants were selected on the basis of relationships, experiences and roles with regard to the key study elements. Face-to-face in-depth interviews were conducted at the key informants' office between May 2014 and May 2016. A total of 56 key informants were selected, including nine high-level government officials (the former Deputy Prime Minister of Thailand; the Governor of Mukdahan Province; the Director of the Sustainable Development Department of the Industrial Estate Authority of Thailand; the Director of the Strategic Planning Department of the Mukdahan Government House; the Director of the Office of Commercial Affairs Mukdahan; the Director of the Mukdahan Provincial Industry Office; the Consul of the Royal Thai Consulate General in Savannakhet; the Vice-Governor of Savannakhet District and the former Director of the Strategic and Planning Department of the Ministry of Planning and Investment of Lao PDR), 25 high-level executives and members of non-governmental organizations (the President of the Mukdahan Chambers of Commerce; the President of the Mukdahan Federation of Industries; the Manager of the Savannakhet Chamber of Commerce and Industry; 10 local entrepreneurs in Savannakhet, 10 local entrepreneurs in Mukdahan) and 22 community leaders and members (representatives of the local environmental protection organizations in Mukdahan and Savannakhet; 10 local community leaders each in Mukdahan and Savan-Seno were also involved in the study.

**3) Data analysis**

This study uses qualitative analysis to present opinions, perceptions of gaps, barriers, problems and needs, and interview results according to SEA and SA, together with the special economic zone policy and plan. Moreover, SEA and SA processes are presented and proposed as specific designed processes for the special economic zones in AEC region. Furthermore, the result is analyzed in view of policies and plans related to critical economic, environmental and social dimensions. The study used content analysis to compare the situations in the special economic zones and forecast future results in order to propose the strategic SD framework for the special economic zones in AEC.

**4) Case study**

This study selected the Savan-Seno (Figure 2) and Mukdahan (Figure 3) special economic zones, SSEZ and MSEZ, respectively, because

both zones are covered by one of the important development projects along Route 9. The SSEZ and MSEZ are located next to each other and positioned as one of the biggest AEC economic areas. Moreover, these zones also share similar levels of socio-economic development conditions with most South East Asian nations.

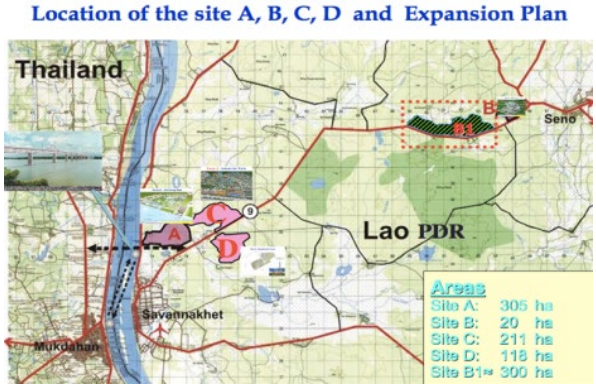


**Figure 2** Savan-Seno Special Economic Zone.


**Figure 3** Mukdahan Special Economic Zone.

The SSEZ is located in Savannakhet Province, Lao PDR and comprises A, B, C and D sites located on the border of Savannakhet along the Mekong River. The four sites cover a total area of about 600 km$^2$. Recently, a feasibility study was conducted and management plan developed for Site C by a Malaysian company, the Pacific Stream Development Co., Ltd. However, no such exercise has been conducted for site D and some parts of site B1. The MSEZ located in Mukdahan Province in the north-east Thailand benefited since the opening of the second Thai–Laos Friendship Bridge in January 2007. The MSEZ covers 11 sub-districts along the border area of Muang Mukdahan, Wan Yai and Don Tan districts, covering a total area of 578.50 km$^2$.

## Results

The goal of this study is to design a strategic SD framework for the special economic zones in AEC. Accordingly, the study is divided into the following three main parts:

### 1) Part I: Defining key success factors of the strategic SD framework

This part identifies key success factors that determine SD in the target areas from: 1) a literature review; and 2) face-to-face in-depth interviews. It found all key informants generally agreeing in their responses to the interview questionnaires with 11 key success factors identified. In order to incorporate these factors into the strategic framework, the key informants were requested at the end of the interview to group these into the strategy map perspectives. This method follows the proposal of Chan [5] that dividing the strategy map key success factors into fourth perspectives, could manipulate all management tasks and promote sustainable development. The following key factors were identified:

A) Learning and growth perspective

- Public education was mentioned as a key success factor. According to the Organization of Economic Co-operation Development (OECD), public education guarantees improved social knowledge and understanding and increases public accountability [23]. The former Deputy-Prime Minister of Thailand also told the authors that "Public education will prepare society to have mutual understanding and ready for future developments." (Interviewed on 2 January 2016).
- The quality of the educational system was recognized as fundamental for sustainable development. The Vice-Governor of Savannakhet told the authors "he supports setting up com-

prehensive educational institutes in the areas, ranging from kindergarten up to university to provide community members with knowledge that will benefit to the development in return." (Interviewed on 17 December 2015).

- The importance of international SD standards was underlined by key informants from government organizations. These standards allow authorities to be more responsive in their decisions [15]. The Director of the Sustainable Development Department, Industrial Estate Authority of Thailand said that "any development needs to be in compliance with international SD standards." (Interviewed on 12 August 2015).

B) Internal perspective

- A sound policy is considered as the most critical factor by most key informants. As the OECD has noted "Unsustainable practices may result from incoherent policies in different domains…" [24]. The Vice-Governor of Savannakhet stated that "policy must be carefully designed to make sure that development is managed properly and strictly enforced under laws and regulations." (Interviewed on 17 December 2015).
- Management structure, holistic management and institutional structure can directly support sustainable development. As North D states: "Institutions are the rules of a society, […] the institutes shape human interaction […] and led to formal contracts between parties…" [21]. The President of the Mukdahan Chambers of Commerce told the authors that "management structure and holistic management will allow all related parties to join in the development processes." (Interviewed on September 2015).
- Good environmental management prevents environmental degradation. As the UK Environmental Law Association notes, environmental management can involve penalization of environmental offenders, support environmental decision making and enable the public to take part in the development process [7]. Local entrepreneurs in Savannakhet told the authors that "environmental management can strengthen development abilities to cope with three main environmental problems include: air pollution, water contamination, and those direct environmental problems to community." (Interviewed on 15 December 2015).
- Zoning and infrastructure have become more important as the world population increases. According to the Department of Planning and Community Development, City of Atlanta in the United States of America, proper zoning enables sustainable and equitable growth and development of the city [6]. The President of the Mukdahan Federation of Industries told the authors that "zoning system is essential for development. It can reduce social and environmental risks." (Interviewed on 16 December 2015).

C) Financial perspective

- Expenditure or sustained financing support was also considered as an essential requirement by key informants, both from governmental and non-governmental organizations. The President of the Mukdahan Chamber of Commerce said that "many SD projects were terminated after a very short period because there was no sustained budgetary support. SD cannot be implemented only by community's volunteers." (Interviewed on 17 December 2015)

D) Stakeholder perspective

- Public participation was recognized as an important factor as it helps gain community support. According to the United States Environmental Protection Agency (EPA), public participation actually results in better outcomes and governance. Public participation produces two significant benefits: 1) Sponsorship or public support for management agencies and 2) development of long-term community capacities [7]. This is supported by the scholar, Mr. Piyapong J.,

who commented that "the participation of each stakeholder in decision-making processes, ranging from problem identification to solution selection, community rule designs, rule enforcement and compliance, and outcomes monitoring, is also imperative" [25]. The public participation also takes essential roles to achieve the perceived legitimacy of community efforts [25]. A group of Savannakhet community representatives said that "public participation will create transparency in the development process. Moreover, the community will support the development initiative without any doubts." (Interviewed on 23 December 2015).

- Public health care was highlighted, mainly by key informants from community and governmental organizations. A special economic zone increases chances of outsiders into the community so that it increases public health risks too. Walden University confirmed that "Public health initiatives increased life expectancy in the U.S. by nearly 30 years." [34]. So that the public health risk from SEZs needs public health initiatives to address these. A group of Mukdahan entrepreneurs told the authors that "labour migration into the SEZ will introduce new diseases into the area. Therefore, public health must be provided." (Interviewed on 15 December 2015).
- Local business protection was emphasized as important for the success of SD by most key informants. Mukdahan local entrepreneurs and the Governor of the province said that "the special economic zones attract investors from around the world to invest in the area with many privileges provided. This could negatively impact local businesses that have less access to capital and lack competitive advantage. Therefore, business subsidiaries should be prepared for local businesses." (Interviewed on 14-15 December 2015).

**2) Part II: Constructing "strategic process" body of the strategic SD framework**

The study discovered that SEA and SA shared similar SD elements. It synthesized elements from SEA, SA and the strategy map. This idea is supported by Noble B. who proposed that SEA could utilize many existing methods and techniques from project-level assessment, the types of questions being addressed in strategic assessment which are inherently different from those in project-level assessment [20]. According to Hatim M., SA is suitable for project level application because it provides various ideas on the proper actions to be taken to promote SD. It is even better to apply SA together with SEA and other management tools [10]. Accordingly, the study integrates all related elements into one process, including: 1) current status/ problem report; 2) negative impact of development; 3) objectives of development; 4) policy and plan of development; 5) implementation, activity and monitoring plans; 6) alternatives; 7) activities; 8) duration; 9) impact forecast and 10) additional issues.

**3) Part III: Constructing "sustainability assessment" body of the strategic SD framework**

The study found that ISO 26000 and GRI G4 can be applied to upgrade the framework to perform at a high performance level. Moreover, it reconfirms that the strategic plan is in keeping with international standards. Scholars supporting this position include Toppinen et al. who explain that ISO 26000 is globally acknowledged [31]. Mory et al., Bowman, and Lou et al. also state that ISO 26000 application can support and ensure good quality development practice [3, 16, 18]. Moreover, Knebel & Seele explain that GRI can support, monitor and assess environmental and social perspectives because GRI comprises key SD performance indicators that can help organizations build social and environment-friendly backgrounds [15]. Therefore,

the study extracts and integrates beneficial elements of these two SD standards. As a consequence, ISO 26000 is used as a main filter to scope the strategic plan of the framework while GRI G4 is used as specific indicators support each ISO 26000 issue.

## Discussion

This section discusses the integration of all findings in Parts I to III in order to achieve the main objective of this study. The integration is shown in Figure 4.

All findings in Parts I to III support the establishment of the proposed framework. Part I findings are the basic SD key success factors which are categorized into four perspectives of the strategy map to help management authorities using the framework in allocation of different tasks. The study refers to related studies in other regions. For example, Sertyesilisik and Sertyesilisik have explained key success factors that influence sustainability in the special economic zones in Canada and the United States. There are many important issues such as "policy" designing process and how to enhance "collaboration" among parties including governments, private institutions, communities and academia. In Europe, the key success factors are "legislation and enforcement of law". Thus, it is important to focus on how to create the flexibility of regulatory requirements on performance standards as well as regular SD monitoring and evaluation [29]. Furthermore, analysis by Porter et al. [26] shows that the essential key success factors are public participation, zoning and institutional development. He stresses the importance of establishing related governmental organizations and management structures. However, additional factors should be considered for inclusion in the framework before initiating development planning. This can help improve understanding of authorities about current development conditions and how to avoid likely risks [14].

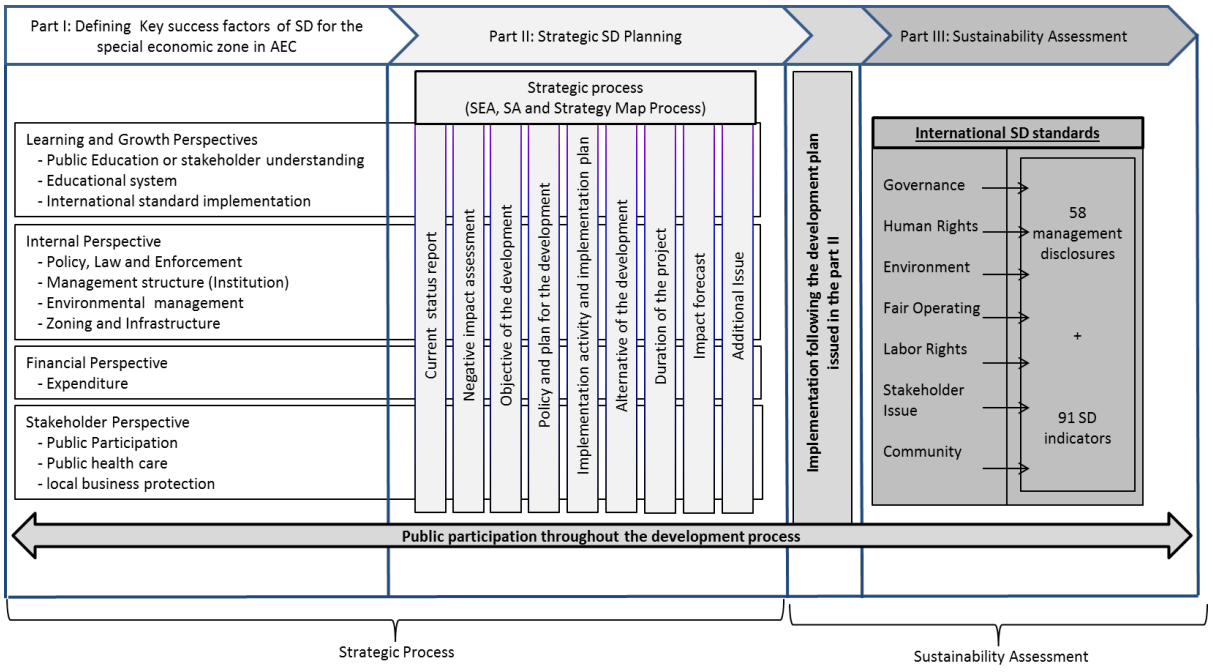


**Figure 4** Development of the strategic SD framework for the special economic zones in AEC.

The study constructs the "Strategic Process" body of the framework by integrating Parts I and II. Both parts were designed according to the management structure of the Strategy map which can underline SD in the framework. Jóhannsdóttir et al. [12] have proposed that the strategy map can support organizations to apply the SD concept into their management process, especially when implementing with other SD tools. As a result, the 11 key success factors have been included in Part II. In Part II, each key success factor will be planned through 10 strategic steps in order to set up the development direction of each factor. By this process, the authorities will gain advanced SD information and strategic plans of each factor such as: current situation which leads to assessment of development gaps and plans; risks and negative impacts; weaknesses in current development status; and future development forecast; alternative development options among others. The information will be readily available to them when the 10 strategic steps have been implemented. Then all strategic plans will be implemented into the regular management basic (appeared as implementation section in the Figure 4). During the implementation period, all activities will be monitored using the standard management KPI. However, specific SD KPIs must be introduced in this process. SD KPIs can be easily defined from Part III of the framework, the so-called "Sustainability Assessment" body. The assessment includes two well-known international SD standards, namely ISO 26000 and GRI G4 into the process. The study found out that ISO 26000 can be the first layer filter to grade activities into seven groups, following ISO 2600 norms. Then, GRI G4 can be used as sub-indicators to rate performance following international standards. Moreover, the study found that GRI G4 has been used to provide as sustainability development directions since it has guidelines and sets development goals. According to the GRI committee, GRI G4 is a complete set of SD management guidelines and indicators which can be used by all organization to set themselves on the SD path [15]. In its final stage of development, the strategic SD framework will provide assessment results and ratings, based on GRI G4 guidelines that would benefit future planning.

Furthermore, it is strongly recommended that all processes should involve full public participation in order to allow stakeholders to get involved in the development process. Participation would promote support from all stakeholders, which enhance the legitimacy of management authorities.

This study provides guidelines for developing the SD framework for the special economic zones in AEC. The framework provides a holistic management approach that covers the economic, social and environmental dimensions. The framework somehow contains extra abilities comparing to traditional SEA and SA concepts. Moreover, this is an original research that can be considered as the first specific SD study of the target areas. As such, it can be useful input for future studies in this field. This research provides practical recommendations to management authorities of the special economic zones in AEC. Since the framework was designed to be flexible, it is possible use this framework in different areas of the special economic zones.

## Conclusion

Southeast Asia is one of the fastest growing economic regions in the world. Obviously, this has resulted negative social and environmental impacts, which is a matter of much concern to not only the region but also the international community as well as Southeast Asian nations. For these reasons, this study aims to 1) identify key SD success factors in the special economic zones in AEC and 2) develop the strategic SD framework for the AEC special economic zones in AEC. The study was conducted using

qualitative methods, including a documentation review, triangulation analysis and semi-structured face-to-face interviews to gain information, data and stakeholder opinions. The study is divided into three parts.

Eleven key SD success factors are identified in Part I: public education and stakeholder understanding; educational system; international standards; policy and law enforcement; environmental management; management structure; zoning and infrastructure; expenditure; public participation; public health care; and local business protection.

Part II defines the strategic SD framework and includes a synthesis of SEA, SA and Strategy Map elements which include 10 steps: 1) current status/problem report; 2) negative impact of the development; 3) objectives of the development; 4) policy and plan of the development; 5) implementation, activity and monitoring plans; 6) alternatives; 7) activities; 8) duration; 9) impact forecast and 10) additional issues.

Part III designs a "Sustainability Assessment" using sophisticated international SD standards, namely ISO 26000 and GRI G4.

The study then integrates all identified elements into the strategic SD framework. All findings are perfectly matched as all parts were derived from similar perspectives. The framework is designed to be flexible and can be used in other areas. It is recommended that management authorities in other areas conduct a study of their own specific conditions and include these in the fundamental key success factors. This study offers recommendations for sustainable development in special economic zones and the framework can be adapted for other sectors such as transport and agriculture. This study was limited in not being able to access some government documents and information which was restricted as confidential. Furthermore, this study could be counted as the first study about the particular way to obtain sustainable development of the special economic zones in AEC.

**Declaration of conflicting interest**

The authors have no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

**Acknoeledgement**

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**References**

[1] Asian Development Bank (ADB). Financing agreement (special operations) Greater Mekong Sub-region East-West economic corridor towns development project. Metro Manila, Philippines: Asian Development Bank, Project document No. 43319-043, 2012.

[2] Board of Investment of Thailand (BOI). Announcement of the Board of Investment of Thailand (BOI) NO. 3/2015, 2015. [Online] Available from: http://www.boi.go.th/upload/content/3_2558_61031.pdf [Accessed 30 March 2017].

[3] Bowman, G., M. Ensuring good quality practices in an unregulated service laboratory environment utilizing ISO 26000. Dissertation. California State University, 2011.

[4] Bracknell Forest Borough. Final sustainability appraisal report. Bracknell Forest Borough Council, 2006.

[5] Chan, Y., C., L. How strategy map works for Ontario's health system. The International Journal of Public Sector Management, 2009, 22(4), 349-363.

[6] City of Atlanta. Preserving our past transforming our future: Annual report 2013, 2013. [Online] Available from: http://www.atlantaga.gov/modules/show

document.aspx?documentid=12696 [Accessed 4 April 2017].

[7] Environmental Protection Agency. Public participation guide: Introduction to public participation, 2016. [Online] Available from: https://www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation [Accessed 3 April 2017].

[8] Environmental Protection Department, Hong Kong Government. Second railway development strategy 2000, 2000. [Online] Available from: http://www.epd.gov.hk/epd/english/environmentinhk/eia_planning/sea/ebook1_9.html

[9] Fisher, T., B. Introduction to procedures and methods for SEA. Washington: The World Bank, 2007.

[10] Hatim, M. Development of a strategic environmental justice assessment methodology (SEJAM). Dissertation. Polytechnic University, 2001.

[11] Institute of Developing Economy (IDE) and Japan External Trade Organization (JETRO). The formation of industrial clusters in Asia and regional integration. Japan: IDE-JETRO, 2008.

[12] Jóhannsdóttir et al. Leadership role and employee acceptance of change: Implementing environmental sustainability strategies within Nordic insurance companies. Journal of Organizational Change Management, 2015, 28(1), 72-96.

[13] Kaplan, R., S., David, P., N. Strategy maps: Converting intangible assets into tangible outcomes. Boston: Harvard Business School Press, 2004.

[14] Kirklees Council. Kirklees local plan: Sustainability appraisal report. Kirklees, 2015.

[15] Knebel, S., Seele, P. Quo vadis GRI? A (critical) assessment of GRI 3.1 A+ non-financial reports and implications for credibility and standardization. Corporate Communications, 2015, 20(2), 196-202.

[16] Lou, E.C.W., Lee, A., Mathison, G. Corporate responsibility application-UK construction SME. International Journal of e-Education, e-Business, e-Management and e-Learning, 2012, 2(5), 436-442.

[17] Mukdahan Provincial Industry Office. Mukdahan Special Economic Zone background and statistic, 2016. [Online] Available from: http://www.industry.go.th/mukdaharn/index.php/download/22142-sez-muk-pdf/file [Accessed 30 March 2017].

[18] Mory, L., Wirtz, B.W., Göttel, V., Corporate social responsibility: The organizational view. Journal of Management and Governance, 2017, 21(1), 145-179.

[19] Nishiura, S. SEA as a tool for growth management. In-house seminar "Strategic Environmental Assessment (SEA)" April 19. Nakornpathom: Mahidol University, 2005.

[20] Noble, B. Towards a structured approach to strategic environmental assessment: A case study of Canadian energy policy alternatives. Dissertation. Memorial University of Newfoundland (Canada), 2002.

[21] North, D. C. Institutions, institutional change and economic performance, New York, Cambridge University Press, 1990.

[22] Office of Industrial Economics (OIE). 3 Northeastern provinces…the new economic productive area. Bangkok: Ministry of Industry, 2011.

[23] Organization of Economic Co-operation Development (OECD). Improving public sector efficiency: Challenges and opportunities. OECD Journal on budgeting, 2001, 7(1), 1-42.

[24] Organization of Economic Co-operation Development (OECD). Policies to enhance

sustainable development. 2001. [Online] Available from: https://www.oecd.org/greengrowth/1869800.pdf [Accessed 8 April 2017].

[25] Piyapong J. The establishment of a community-based mangrove forest management plan: Lessons learned from mangrove forest conservation in the Nernkhor Sub-district, Rayong Province, Thailand. Applied Environmental Research, 2016, 38(3), 59-75.

[26] Porter, T.H., Gallagher, V.C., Lawong, D. The greening of organizational culture: revisited fifteen years later. American Journal of Business. 2016, 31 (4), 206-226.

[27] Portuguese Environmental Agency. Strategic environmental assessment better practice guide. Lisbon, 2012. [Online] Available from: http://ec.europa.eu/environment/eia/pdf/2012%20SEA_Guidance_Portugal.pdf [Accessed 2 April 2017].

[28] Supaluk K. East-West corridor: Transport to economic corridor. Thailand: GMS Research Center, Faculty of Arts, Ubonratchatani University, 2009.

[29] Sertyesilisik, B., and Sertyesilisik, G. Eco industrial development: As a way of enhancing sustainable development. Journal of Economic Development, Environment and People, 2016, 5(1), 6-27.

[30] The Royal Thai Consulate-General at Savannakhet. Savan-Seno Special Economic Zone, 2012. [Online] Available from: http://www.thaisavannakhet.com/savannakhet/th/data-service/sub-savannakhet/sawannaket/economic.php [Accessed 15 March 2013].

[31] Toppinen, A., Lähtinen, K. ISO 26000 in the assessment of CSR communication quality: CEO letters and social media in the global pulp and paper industry. Social Responsibility Journal, 2015, 11(4), 702-715.

[32] United Nations Economic Commission for Europe (UNECE). Resource manual to support application of the protocol on SEA, 2006. [Online] Available from: http://www.unece.org/env/eia/sea_manual/annexA51.html [Accessed 20 December 2012]

[33] Vietnam Times. Investment grows at SEZs, 2016. [Online] Available from: http://www.vientianetimes.org.la/FreeContent/FreeConten_Investment_218.htm [Accessed 2 April 2017].

[34] Walden University. What is public health and why it is important?, 2017. [Online] Available from: https://www.waldenu.edu/programs/health/resource/what-is-public-health [Accessed 5 April 2017].