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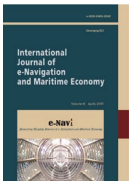

Original article

# Assessing potential impacts of alternative maritime route on ASEAN region

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## Abstract

The Kra Canal is a mega-project that provide a new maritime route that would connect the Gulf of Thailand with the Andaman Sea, linking the Indian and Pacific Oceans. The idea of building the Kra Canal has widely gained attention from policy-makers, legislators, maritime activities, shipping and seaport operators due to advantages such as big cost savings, higher levels of safety and security, shortened distance and time compared to the voyage through the Straits of Malacca and Singapore. This waterway will likely challenge the present maritime business activities in ASEAN region. Therefore, the aim of this article is considering the pros and cons of the Kra Canal project to political, economic, sociological, legal, environmental, maritime security, and safety aspects by using the thematic analysis combined with PESETLM method. It is note that the new Canal will be beneficial for Vietnam in all aspects, especially maritime economy. Therefore, this article is pioneer research to a comprehensive analysis of the trend of the Vietnamese maritime industry awaiting to advantages of the Kra canal. Given the inherent strengths of the geographical features, the novel maritime business strategies are proposed to boost and reshape the Vietnam maritime economy, for instance the best policy to enhance co-operation and trade growth with other countries and regions; a variety of investigations of maritime business in strategy regions; enhancing Cai Mep - Thi Vai ports as hub port of Vietnam; the development of deep-water seaports and logistics services in Hon Khoai Island and long-term planning for main bunker compliance fuel supply or energy source for vessels; policies to enhance management and surveillance, and enforcement of the law, the innovation of administrative procedures in seaports, deep-water seaport electronic services, and electronic customs in the digital era.

*Keywords: Alternative maritime route, Maritime industry, potential impacts.*


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## 1. Introduction

The initial idea of building the Kra Canal (the Kra Isthmus Canal) has been proposed and discussed between maritime players since the late 17th century as a mega-project directly linking the Gulf of Thailand with the Bay of Bengal in the Indian Ocean at the Isthmus of Kra, Thailand. This project will provide various trade and economic benefits to Thailand and the Association of Southeast Asian Nations - ASEAN region (Sulong, 2012). The Kra Canal will allow ships to overtake the Strait of Singapore and Malacca to avoid the risk of pirates and congestion, avoid heavy traffic at Straits of Malacca, and can reduce the number of the accidents of ships at the straits (Jeevan et al., 2018, 2016). By using the Kra Canal, ships can reduce their sailing distance and time instead of Malacca Straits, Sunda Straits, and Lombok strait in Indonesia, 2-7 days (see Figure 1 below). According to the Kra Canal International Forum (2014), the canal is suggested with a length of 102 km, width of 400m, depth of 25 m (Cathcart, 2008; Su, 2015), allowing the largest operation cargo ship in the world, Ultra Large Crude Carriers - ULCC (300,000 deadweight tonnage) go through the Kra Canal (Gulf Times, 2015).

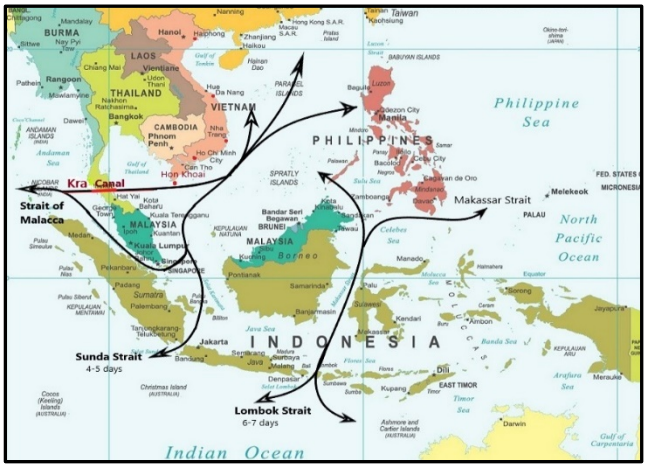


**Figure 1: The Kra canal project in the ASEAN region**

The Canal will definitely, changing the scene of the national maritime industry in the ASEAN and international transportation specifically commercial ships on the Indian-Pacific ocean route. There will be a boon to the shipping industry and economy in the region because of the new accessibility. In this article, the possible implication of this project in the changing Vietnamese maritime industry should be discussed as well as proposing solutions to take its advantages.

Developing the Kra canal issue has been generated attention from scientists and maritime players (Cathcart, 2008; Chen and Kumagai, 2016; Er, 2018; Heng and Yip, 2018; Kiernan, 1956; Khalid, 2006; Kinder, 2007; Lau and Lee, 2016; Min, 2015; Su, 2015; Sulong, 2012; Thapa et al., 2011). Looking at Table 1 below, the initial idea of excavating the Kra Canal emerged by a French engineer, M. De La Mar since the 17th century in the reign of Siamese King Narai (Min, 2015).

Various feasibility researches of the Kra Canal project have been done, for instance, a feasibility study for the Kra Canal project of Chow combined with a U.S. consultant, Tippetts-Abbet-McCarthay-Stratten (1977). However, this project was abandoned for reasons such as internal political conflict, support funding, policy, security, investment, social-economy, and environment. Interestingly, in recent years Chinese Government and the Government of Thailand have the plan to excavate the Canal which would be significantly funded by China because of its advantages which include: decrease prices of shipping; decrease oil consumption leading to enhancement of environment; decrease maritime accidents; uses as a priority route instead of Malacca Strait, and calls investment's attention to ASEAN region (Kra Canal International Forum, 2014). In 2015, a Memorandum of Understanding has been signed the "China-Thailand Kra Infrastructure Investment and Development Company and Asia Union Group" in Guangzhou (Seatrade, 2015). In recent years, the construction of the Kra Canal for revival, therefor the highlights of its implications for Vietnam should be assessed.

In Vietnam, "The development plan of the Vietnamese shipping industry for 2020 and towards 2030 by the Decree No. 1517/QD-TTg of the Prime Minister" considers six targets which are increasing the ship traffic sizes of all ship types; Improving shipping fleet size of Vietnam; Increasing the number of seaports and improving the productivity of seaports; Developing the shipbuilding sector; Enhancing the maritime logistics and supporting services; Improving human resources in maritime transport. It is noted that Vietnamese academic literature lacks the researching on the potential effects of the Kra canal project on the Vietnamese maritime economy. Therefore, this article is pioneer research to a comprehensive analysis of the trend of the Vietnamese maritime industry awaiting to advantages of the Kra canal.

## 2. Methodology

Political-Economic-Sociological-Technological-Legal-Environmental analysis method as a technique for "Scanning the Business Environment" that was developed by Aguilar (1976) who discussed four factors economic, technical, political, and social. Several of authors, such as Porter (1985), Fahey and Narayanan (1986), Morrison and Mecca (1989), Jurevicius (2013), Rastogi and Trivedi (2016), and Abdul Rahman et al. (2016) improved this method, including various classifications such as PEST (political, economic, socio-culture, and technological factors), STEEPLE (socio-cultural, technological, economic, environmental, political, legal and ethical factors), STEP (socio-cultural, technological, economic, political factors), SPEPE (socio-cultural, economic, political, environment factors). PESTLE method is a useful tool to identify important factors that impact maritime business industries (Helmold, 2019; Pulaj and Kume, 2013; Syazwan Ab Talib et al., 2014; Vintilă et al., 2017). This method gives us a panoramic view of the specific issue that was checked on a plan. The most research sectors have been published by using PESTLE methods such as automobile sector (Li et al., 2009; Tan et al., 2012), logistics industry (Vintilă et al, 2017; Von and Darkow, 2010), infrastructure sector (Pulaj and Kume, 2013; Vintilă et al., 2017), and marine field (Abdul Rahman et al., 2016, 2014; Kolios and Read, 2013; Sridhar et al., 2016 Braun and Clarke, 2006; Komori, 2015). The PESTLE method finds the answers of seven key questions regarding Political, Economic, Socio-cultural, Technological, Legal, and Environmental aspects. However, the PESTLE method does not consider the "maritime security". It means PESTLE is not a comprehensive view for experts to give their opinions. Thus, a new security factor will be considered to make the strength of the PESTLES method. The maritime security factor should be considered the national terry marine safety, sea-born trade, exploitation of oil and fisheries, and human trafficking (Basil, 2015; Michael, 2016; Nguyen and Phan, 2020).

In this study, the standard seven factors of the probable implication of Kra Canal project on Vietnamese shipping industry are analyzed by using thematic PESTLES method. The finding answers seven key questions of experts from the main agencies including Vietnam Maritime Administration, Ministry of Transportation, Vietnam Oil and Gas Group, Port operator, Port Authority, Shipping Company, Logistic Company, and Freight Forwarders. The seven key factors are:

- Political aspects: tax policies, stability of government, control COVID-19 pandemic, social policies, law and regulation, education policies and national shipping industry plan.
- Economic elements: investment policies, income of buyer, Gross domestic product (GDP) growth, market trend and unemployment rate.
- Social-cultural aspects: trend and life-style, population demographics, distribution of wealth, and attitude toward products and services.
- Environmental problems: maritime activities pollution, management of waste, weather and climate change and national obligation on protection environment.
- Technological trend: basis of infrastructure, internet infrastructure and national technology level.
- Legal aspects: Health and safety law, consumer protection and property, and implication of international provisions.
- Maritime security aspects: co-operation to control maritime safety and security at sea, sea-power, human trafficking, fisheries, oil and gas expoitation.

Advantages and benefits of the Kra Canal for shipping companies, ship navigators, and ship are very clearly identified above. Thus, in order to estimating implication of the Kra Canal project on the trend of the Vietnamese shipping industry, the thematic analysis combined with PESETLM analysis through different aspects will be used.

## 3. Vietnamese industry toward alternative route

Vietnam Government has made a series of laws and industrial policy packages such as Industrial Development Strategy, Vision Toward 2035; Strategy for Science and Technology; Development for the 2011–2020 Period; Automobile Industry Development Plan of Vietnam; Development Plan of Garment and Textiles Industry of Vietnam to 2020, Vision to 2030; Strategy of Using Clean Technology to 2020, etc. to ensure a fair environment for both foreign and domestic investors that detail policy approaches to attract the

investment in support of industrial development, to fund, industrial infrastructure, high-tech parks or research or skills programs (UNTAD, 2018). New investment was proposed in various sectors such as transport, energy, environment, include the establishment of the new international gate in Cai Mep – Thi Vai and Lach Huyen ports as well as building North-South highway along Vietnam's coastline. Vietnam has extensive relations with various countries and regions such as the USA, China, Japan, Korea, Hongkong, Singapore, Malaysia, Taiwan, Kuwait, Belgium, Netherlands, and Germany (UNTAD, 2019).

The shipping fleet of Vietnam includes 1,863 vessels, totaling around 8.177 million dead-weight tonnages, reaching about 1.98% of world total DWT (as of Dec. 2018). Vietnam has a large ship tonnage - shipping fleet in the ASEAN region, ranking number 4 (Table 1). Besides that, the shipping fleet size of the ASEAN region is increasing 4.15% of DWT per year, interestingly Thailand's fleet is increasing 15.21% of DWT per year that the Kra Canal is expected to cause. Considering calculate the distances the hypothetical routes through the Kra Canal by GIS, Chen and Kumagai (2016) estimated that Myanmar, Thailand, Cambodia, Laos, and Vietnam will get benefits from the Kra Canal. While Singapore, Malaysia, Indonesia, and Southern Thailand have negative impacts. If the Kra Canal is built, the increased international trade and shipping around the canal will also support the development of the Southern Economic Corridor (SEC) which covers Cambodia, Vietnam, and Thailand (Sisovanna, 2012). It dramatically increases commercial, industrial and tourism activities in the coastal SEC region.

A widely used indicator provides insights into the ability of a seaport that is volumes handled by the port, including all cargo types such as containers, liquid cargo, and dry cargo can serve as a leading economic indicator. As for Vietnam, the increased maritime shipping activities around the Kra Canal would pass by coastal Vietnam, therefore, give rising a great incentive development for the Vietnamese southern port system with the potential of rivaling Singapore ports. Figure 2 provides a list of the Vietnamese seaports cargo throughput, increased by 328% to 14,733,000 TEUs in 2018, compared with 4,489,165 TEUs in 2007 rising from the development of Vietnam's seaport system (44 seaports with 219 terminals). The current maritime business patterns in Vietnam focus on two international gateway seaports which are Lach Huyen port and Cai Mep - Thi Vai ports to welcome ship sizes of 80,000 - 100,000 DWTs and 4,000 - 8, 000 TEUs. Table 3 shows that ship call at Vietnamese port was increased continuously from 98,901 vessels in 2012 to 112,701 vessels in 2017. Looking at Figure 2, it shows the upward trend of ship call ports and cargo throughput of seaports Vietnam. It is expected that dramatically increase in throughput induced by the development of the new canal.

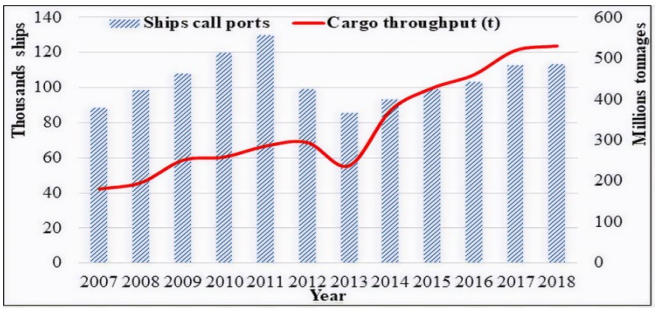


**Figure 2: Trend ship call ports and cargo throughput of Vietnam** (Source: Vietnam Maritime Administration, 2019).

**Table 1: Shipping fleet of ASEAN countries**

| Rank among ASEAN | Country | Number of vessels | % of world total Dwt | Dead-weight ($10^3$dwt) | % sharing total Dwt | % of cumulative part Dwt | The average ship size (dwt) | % change Dwt 2017-2018 |
|---|---|---|---|---|---|---|---|---|
| **1** | Singapore | 3256 | 3.74 | 127880 | 6.65 | 57.52 | 36268 | 2.93 |
| **2** | Indonesia | 9053 | 9.61 | 22313 | 1.16 | 81.64 | 2465 | 9.95 |
| **3** | Malaysia | 1704 | 1.81 | 10230 | 0.53 | 90.29 | 6004 | 3.88 |
| **4** | Vietnam | 1863 | 1.98 | 8176 | 0.42 | 92.57 | 4389 | 2.01 |
| **5** | Thailand | 807 | 0.86 | 6212 | 0.32 | 93.67 | 7698 | 15.21 |
| **6** | Philippines | 1615 | 1.72 | 5683 | 0.30 | 94.29 | 3519 | -8.41 |

Source: Review of Maritime Transport, UNTAD (2018)

The changes in the geographical aspect after implement of the Kra Canal which are new maritime routes can be developed. They are for instance Northern region (Hai Phong port) - Kra Canal - Middle East/Europe; Central region (Van Phong port) - Kra Canal - Middle East/Europe; Southern region (Ba Ria - Vung Tau) - Kra Canal - Middle East/Europe. Vietnam has a priority strategy for developing international gateway port for vessels of larger than 100,000 DWT in Hai Phong city, Ba Ria - Vung Tau, and Khanh Hoa provinces, developing comprehensive navigation facilities in all channel systems. Currently, Vietnam is enhancing on the waterway between Ho Chi Minh City and Ca Mau to facilitate the operations of barges of more than 2,000 tons, upgrading Xa No Canal and the Dai Ngai-Bac Lieu-Gia Rai sea route, modernizing large river ports for containerized goods including Binh Long, An Phuoc, Long Binh, and Cai Lay Ports, upgrading project to dredge and expand Cho Gao Canal to 80 meters, etc.

**Table 2: Distances between sea-port through the alternative route**

| Port | | Distance without Canal (Km) | Distance via Canal (Km) |
|---|---|---|---|
| **Hai Phong** | Yangon | 4,517 | 3,618 |
| | Chittagong | 5,257 | 4,358 |
| | Madras | 5,385 | 4,486 |
| | Colombo | 5,448 | 4,549 |
| | Bombay | 6,987 | 6,088 |
| | Rotterdam | 17,955 | 17,056 |
| **Cai Mep** | Yangon | 3,299 | 1,896 |
| | Chittagong | 3,969 | 2,636 |
| | Madras | 4,097 | 2,764 |
| | Colombo | 4,160 | 2,827 |
| | Calcutta | 4,216 | 2,883 |
| | Rotterdam | 16,959 | 15,626 |
| **Hon Khoai** | Yangon | 2,919 | 1,516 |
| | Chittagong | 3,589 | 2,256 |
| | Madras | 3,699 | 2,384 |
| | Colombo | 3,780 | 2,447 |
| | Calcutta | 3,836 | 2,503 |
| | Rotterdam | 16,579 | 15,246 |

The Hon Khoai Port becomes the new shipping hub as a special trade zone, it attracts investment of various production companies and providing opportunities to business as well as the development of the regional economy. According to the Kra Canal and Singapore coexist for the scenario in 2030 calculated by ultilizing the Institute of Developping Economies' Geographical Simulation Model (IDE-GSM) ( see Table 2 and Table 3), Vietnam is the country that has positive economic impacts, predicted around USD 486 million, Vietnam's GDP increases by 0.09% (Chen and Kumagai, 2016).

**Table 3: The economic Impacts of the alternative route**

| Port | | Distance change (Km) | % | Economic Impact |
|---|---|---|---|---|
| **Hai Phong** | Yangon | -899 | -20% | 0.25% |
| | Chittagong | -899 | -19% | |
| | Madras | -899 | -17% | |
| | Colombo | -899 | -17% | |
| | Bombay | -899 | -13% | |
| | Rotterdam | -899 | -5% | |
| **Cai Mep** | Yangon | -1,333 | -41% | 0.36% or more |
| | Chittagong | -1,333 | -34% | |
| | Madras | -1,333 | -33% | |
| | Colombo | -1,333 | -32% | |
| | Calcutta | -1,333 | -32% | |
| | Rotterdam | -1,333 | -8% | |
| **Hon Khoai** | Yangon | -1,333 | -46% | 0.46% or more |
| | Chittagong | -1,333 | -37% | |
| | Madras | -1,333 | -36% | |
| | Colombo | -1,333 | -35% | |
| | Calcutta | -1,333 | -35% | |
| | Rotterdam | -1,333 | - 8% | |

Source: Adapting calculated by IDE-GSM

## 4. Discussion

Increasing the number of ships related to new routes between East Asia and Europe that bypasses Vietnamese water will create various pros and cons for the maritime industry. In this article, the questions and direct discuss have been conducted with scientists and maritime experts from the Ministry of Transportation, Vietnam

Maritime Administration, Vietnam Oil, and Gas Group, Hai Phong Port Authority, Lach Huyen Port operator, Shipping Company, Logistic Company, and Freight Forwarders. Experts from different agencies had been approached to be interviewed and give an opinion about the impact of the Kra Canal on the Vietnamese maritime economy. The questions were designed to archive the aim of the article which includes policy, economy, social-cultural aspect, technological, legal and environmental aspect.

The questions during this section were mainly based the implication of the Kra Canal on Vietnamese maritime economy such as the transportation system, the challenge of the seaport as well as the pros and cons of Kra Canal on Vietnamese industry. Regarding to analysis of the Kra Canal implication on the Vietnam Maritime industry seven experts have been interviewed from 20 minutes to 50 minutes. After analyzing and generating information and data from questionnaires and directly interviews experts (DIX) as thematic PESTLES method.

According to the interview section, these experts have provided various opinions regarding the Kra Canal project. Firstly, participants from the Ministry of Transportation (DIX1), Vietnam Maritime Administration (DIX2) and Vietnam Oil and Gas Group (DIX 3) have mentioned that this project expected to provide a variety of benefits and drawbacks, particularly southern region in term of adopting policies and law, socio-economic progression, management of the environment and ensuring security. Secondly, participants from Lach Huyen port operator (DIX5) and Hai Phong Port Authority (DIX4) have mentioned that the Canal will be effected to the number of the commercial vessels that entering and existing deep seaports of Viet Nam such as Cai Mep - Thi Vai ports and Lach Huyen port. The participants from Shipping Company (DIX6) and Logistic and Freight Forwarder Company (DIX7) ensure that a new route through Kra Canal will transform deep seaports of the southern region as an important terminal in the world. The development of this canal, the cooperating strategy will be a new era between Vietnam ports and commercial fleets to provide sufficient cargo to and from Vietnam ports.

The Kra Canal implication creates the motivation for adopting policies to enhancing cooperation and investment of domestic and oversea business (DIX1, DIX2) to new port such as Hon Khoai port. In the negative impact is that the movement of investors from traditional ports to the new deep-water ports focuses on the main ports of the southern region.

The Kra Canal will not only benefit Thailand, but it supports developing the economy of Asia countries near the Canal (DIX6). The Kra Canal will be one of the important international routes, therefore, more foreign vessels will call at the Vietnamese ports (DIX6, DIX7). The Hon Khoai, Cai Mep - Thi Vai, and Van Phong Ports are expected to go increase the income and profit of seaports (DIX5). More vessel calls result in increasing income and commission (DIX3, DIX4). More cargo handled by the ports leads to increasing income of logistics and supply chains (DIX1) that makes an important distribution to the Vietnam economy. Southern ports have a trend in developing ship-compliance fuel supply bunker chains (DIX3). This canal will save time, transportation costs that directly affect the cost of transportation around the world (DIX6, DIX7) comparison with sea freights passing through the Strait of Malacca are longer distance and pirates with demand protection fees and high insurance fees. Besides that, the Kra Canal has the negative implication on the economy such as increasing preparedness and respond cost due to oil and Hazardous and Noxious Substances – (HNS) spills (DIX2); increasing the cost for search and rescue activities at Vietnam waters (DIX1); decreasing the fishery activities in Southern due to international route and ports change (DIX6, DIX4).

DIX1 declared that the Kra Canal will create jobs, income, a tourism attraction, and business central for people in the local community around the deep seaports area. There will be the developing logistics and supply chains such as warehouses to store cargo for maritime transportation, and providing food and water for ships. It is expected to enhance Vietnam industries and agricultural products for export to every part of the globe (DIX5). However, with a high density of vessels will reduce fishing grounds (DIX2, DIX3), therefore fishing income in the Southern is expected to show a downward trend. Social life fisheries around the southern region may be maintained or negatively impacted.

On the other hand, DIX4 from Hai Phong Authority

recommended that the Kra Canal will motivate lawmakers to develop a legal framework for shipping, seaport, logistic services activities, and participating in international instruments such as International Maritime Organization (IMO) Conventions, bilateral/multilateral agreements. It will create a legal and instrumental system that promotes the development of the shipping industry like administrative reform.

According to DIX1, management plays a vital role to solve environmental issues that will happen from ship and port activities. The Kra Canal saves fuel consumption and decreases air pollution, making a better environmental life. A participant from Maritime Administration (DIX2) declared that the Kra Canal will enhance the development of green port systems, particularly new ports such as Hon Khoai. The number of vessels entering and exiting port increases, pollution problems from ships, and seaport activities will be increased. It requires more devices equipped with waste reception/treatment as well as preparedness for major environmental disasters such as oil/chemical spill at sea.

According to (DIX3 and DIX4), the Kra Canal will have a huge role to increase the safety of the vessel. Vessels will avoid risks of terrorism and pirates, and risk of collision when passing through the Canal instead of through the Strait of Malacca. Sea transportation through the Strait of Malacca and Singapore is very congested and wide limited causing many accidents. The Kra Canal project will create to motivate increasing to control security at sea for safety and smooth sailing, including piracy and terrorist acts (DIX5). However, the number of vessels passing through Vietnam waters is expected to increase dramatically, causing climbing the risk of ship collisions or accidents in these sea areas.

Currently, the terminals in Ho Chi Minh and Cai Mep - Thi Vai on Mekong river are the main gateway for the southern region of Vietnam, accounting for more than 60% of container traffic in Vietnam. The Kra Canal will be a new world economic route that plays a vital role in world transportation. Thus, Vietnam needs to give solutions to make the most of the benefits of the Kra Canal scenario that is going to be realized. First and foremost, there should be the best policy to enhance co-operation and trade growth with other countries and regions such as USA, Japan, Korea, China, Thailand, Cambodia, etc. through the Free Trade Agreement (FTA) e.g. ASEAN FTA, EU: E-VFTA, EAEU, JVFTA, Vietnam-Korea, and Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Variety of investigation of maritime business in strategy regions such as Cai Mep-Thi Vai ports, Cat Lai Port, Vung Tau port, Sai Gon port, Dong Nai Port, Binh Duong port, Long An port, Can Tho, and Hon Khoai ports or potential increase market share. There are four potential strategies that can be implemented which are enhancing Cai Mep - Thi Vai ports as hub port of Vietnam; the development of deep-water seaports and logistics services in Hon Khoai Island and long-term planning for main bunker compliance fuel supply or energy source for vessels. When the Kra Canal is realized, the amount of maritime trade pattern is expected that will highly increase in the southern. The Cai Mep - Thi Vai and Hon Khoai ports have benefits because of its geographical location is close to a new navigation route based on the Kra Canal. In addition, enhancing management and surveillance, enforcement of maritime law, an innovation of administrative procedures in seaports, deep-water seaport electronic services, electronic customs, etc. should be implemented to provide competitive services. It provides many opportunities for maritime business partners and enhancement of developing local economies such as creating jobs, income, tourism activities, business centers, and sources of the industry.

## 5. Conclusion

In this article, the advantages and disadvantages of the Kra Canal to political, economic, sociological, legal, environmental, maritime security factors were considered by DIXs by using thematic PESTLEM analysis. The new Canal is beneficial for Vietnam in all factors, especially economic factors. The inherent strengths of the geographical features need to take advantage to propose a plan for the maritime business in order to boost and reshape Vietnam's maritime economy, for instance the best policy to enhance co-operation and trade growth with other countries and regions; a variety of investigations of maritime business in strategy regions; enhancing Cai Mep - Thi Vai ports as hub port of Vietnam; the development of deep-water seaports and logistics services in Hon Khoai Island and long-term planning for main bunker compliance fuel supply or energy source for vessels; policies to enhance management and surveillance, and enforcement of the

law, the innovation of administrative procedures in seaports, deep-water seaport electronic services, and electronic customs in the digital era.

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