

Promoting Sustainable Development of Vietnam's Marine Economy in the Process of International Economic Integration

Nguyen Thi Thu Huong (Correspondence author)

Academy of Finance, Hanoi, Vietnam

Nguyen Xuan Dien

Academy of Finance, Hanoi, Vietnam

Pham Nguyen My Linh

Asper School of Business, University of Manitoba, Manitoba, Canada

Nguyen Thi Phuong Loan

Academy of Finance, Hanoi, Vietnam

Nguyen Linh Phuong

Academy of Finance, Hanoi, Vietnam

Nguyen Minh Hanh

Academy of Finance, Hanoi, Vietnam

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Abstract

Vietnam is a coastal country with great potential as well as a long history of development in the marine economy. The sea holds great potential for Vietnam's socio-economic development, notably the advantages of favorable geographical position and richness of mineral resources (especially oil, gas, coal, and salt). However, Vietnam's marine economy has not really developed in accordance with its demands and its inherent potential. This study analyzes the status quo of Vietnam's marine economic development recently. Then, the authors clarify the results, limitations as well as causes of the limitations in the Vietnam's marine economic development. A range of recommendations for promoting sustainable development of Vietnam's marine economy in the process of international economic integration are proposed.

Keywords: sustainable development, marine economy, international economic integration

1. Introduction

Statistically, Vietnam is a country with great potential for marine economy with a coastline of more than 3,260 km, a sea area of more than 1 million kilometers (more than 3 times the land area), and a special geographic and geopolitical position. The sea contains enormous resources for Vietnam's socio-economic development, notably the advantages of geographic position, and mineral resources. It has brought to Vietnam many great benefits ranging from mineral exploitation (especially oil, gas, coastal coal and salt), marine economic development, seafood exploitation, marine tourism to development of coastal economic zones. Apparently, the exploitation of marine resources has made an important contribution to the development of the country. Marine economic sectors have always accounted for a large proportion in Vietnam's economic development. There was a decrease in the contribution of the coastal and marine economy to the national GDP from 48% in 2005 to 40.73% in 2010 and to 30.19% in 2017 (Hoang Nam, 2018).

However, due to various reasons, up to now, Vietnam's marine economic development has still been evaluated to be ineffective. According to the evaluation of researchers, Vietnam has mainly exploited raw resources with low technology levels, and there has not been much great added value created to the economic sectors from the sea. In reality, marine exploitation, seaports and tourism are generally still at low levels with weak competitiveness. Therefore, this study focuses on researching the status quo of marine economic development and proposing several recommendations to promote the sustainable development of Vietnam's marine economy in the process of international economic integration.

2. Literature Review

Marine economy includes economic activities on the sea and on the mainland, in which the sea mainly plays the role of raw material exploitation, transportation activities, and tourism activities on the sea while activities of production, processing, logistics services for marine exploitation are mainly carried out on the mainland. The strong development of the scientific and technological revolution in recent decades has allowed humans to exploit and use a variety of natural resources of the sea (Huynh Van Thanh, 2012). Marine economic management contents contain seafood harvesting, marine economy development, marine tourism development, marine resources investigation (Duong Kim Tham, Luong Hai Tan, Hoang Minh Lo, 1990).

Apparently, marine economy has been increasingly played an important role in the economy in many countries around the world. R. Kerry Turner et al. (2013) appreciate the role of coastal areas in the national economy. Meanwhile, Nazery Khalid et al. (2007) highlight the role and the importance of the marine resources exploitation industry, especially oil and gas exploitation. In the current trend, nations uphold the goal of sustainable marine economic development, UNCTAD (2014) points out that marine economic development has an important role for island-owning nations. The exploitation of marine resources creates sustainable livelihoods and ensures food security for these countries. This study emphasizes the core issue of marine

economic development is that along with socio-economic development, this process must achieve both efficiency and optimization of the use of natural marine resources. The foundations of global marine economy are natural resources and marine ecosystems.

However, at present, human activities are causing changes to marine ecosystems, which will deeply affect human life (Pawan G. Patil et al., 2016). In the process of marine economic development, there have been many negative impacts on the environment, in which mineral activities are the industry that can lead to environmental pollution easily (Nazery Khalid et al., 2007).

When referring to factors affecting economic development, Le Thanh Son (2017) divides into three groups of factors: (i) Macro factors group includes state policy, development of science and technology; (ii) Group of factors belonging to the local authorities includes local marine economic development strategy, funding sources for implementation of policies, the capacity to implement policies; (iii) Group of factors belonging to economic organizations includes the ability to run business and production activities, potentials and the awareness of economic organizations on sea and island issues. Nguyen Dinh Binh (2018) proposes that the development of the marine economy depends on nine groups of factors: marine and coastal resources; capital investment; science and technology; human resources; market; policies on marine economy; activities of economic sectors in marine economy; regional links and international economic integration.

It is the fact that Vietnam is a country with a long coastline. Nguyen Thanh Minh (2011) says that the sea plays an important role in the field of security and defense, and the geographical advantage of the sea in the context of international economic integration has created great conditions for Vietnam to promote the development of various types of tourism, oil and gas exploitation and valuable fishery exploitation. Therefore, developing marine economy in a sustainable manner is an important goal of Vietnam. Marine economic development contributes to jobs creation, and the implementation of policies on marine economic development will create opportunities and conditions for not only enterprises to expand production and business activities but also locals in marine areas to have access to training services and employment opportunities that increase incomes and improve the lives of people (Le Thanh Son, 2017). In the near future, Vietnam should focus on investing in a number of islands which have strategic economic positions and potentials for developing marine economy, and bring in high efficiency. Moreover, it is necessary to promote investment in infrastructure, healthcare and education in order to create a breakthrough and gain high competitiveness in the world (Bui Tat Thang, 2012)

3. Methodology

The author chooses qualitative research and descriptive statistics methods. The data source is from the Vietnam's General Statistics Office, Vietnam's National Administration of Tourism. Marine economic activities take place mainly in the spaces of 138 provincial cities, districts/towns with coastal strip, and 12 island districts in Vietnam.

4. Status quo of Marine Economic Development in a Sustainable Manner in Vietnam

4.1 Marine Resources in Vietnam

The South China Sea has very rich and diverse natural resources, including living and non-living resources, resources in seawater, on and in the seabed. (Tran Nam Tien, 2011)

4.1.1 Living Resources

According to the statistics of the Vietnam Research Institute for Marine Fisheries, there are currently 11,000 aquatic species and 1,300 species on the island which are known in Vietnam's marine and coastal areas, including about 6,000 benthic species and 2,000 fish species. There are 83 marine species recorded in the Vietnam Red Data Book (37 species of fish, 6 species of coral, 5 species of echinoderm, 4 species of crayfish, 1 species of horseshoe crab, 21 species of gastropod, 6 species of bivalves, and 3 species of squid). Vietnam's Sea has 110 economic fish species (herrings, mackerels, tunas, Indian mackerels, snappers) belonging to 39 fish families, the total marine fish reserves are about 3 – 3.5 million tons and the allowable fishing capacity is over one million tons per year (Table 1). In addition, there are benefits from molluscs (more than 2,500 species) with significant reserves and high economic value. There are more than 600 species of seaweed (in which 24 species are used for industrial preparations, 18 species are used for medicines, 30 species are used for foods, 10 species are used for fodder, and 8 species are used for fertilizers). In Vietnam's sea, there are many valuable animals such as hawksbill sea turtles, sea snakes, seabirds and marine mammals. Because Vietnam is located in a tropical climate zone, in marine areas, there are also mangrove ecosystems, seagrass ecosystems, coral reef ecosystems, island ecosystems, rocky shore ecosystem, sand dune ecosystem. (Vu Van Phai, 2007)

Table 1. Fish reserves and the ability to exploit fish in the sea of Vietnam

Sea area	Fishes	Reserves		Exploitation ability		Rate (%)
		Ton	%	Ton	%	
Gulf of Tonkin (West)	Floating fish	390,000	83.2	156,000	83	
	Bottom fish	48,409	16.8	31,364	17	16,9
Central region	Floating fish	500,000	89	200	89	
	Bottom fish	61,646	11	24,658	11	23,3
Southeast	Bottom fish	698,307	57.1	279,323	57,1	44,1
	Floating fish	316,000	62	126,000	62	
Southwest	Bottom fish	190,000	38	76,272	38	18,3
Floating hillock	Floating fish	10,000	100	2,500	100	0.4
Total	Floating fish	1.740.000	63	697,000	62.8	100

(Vu Van Phai, 2007).

4.1.2 Non-Living Resources

- Mineral resources. Mineral resources exist in water, on the bottom and in the beds of the seabed. In the waters and continental shelf of Vietnam, there have been many sedimentary basins with oil and gas prospects, of which Cuu Long and Nam Con Son basins have been assessed as having the most favorable prospect and exploitation conditions, with the total estimated reserves equivalent to around 10 billion tons of oil. Along with oil and gas, there are significant reserves of coal in sedimentary basins on our continental shelf (Vu Van Phai, 2007) (Table 2).

Table 2. Estimated potential coal reserves on Vietnam's continental shelf

Sedimentary basin	Reserves	
	Cubic meter (x109 m ³)	Ton (x109 tons)
Song Hong basin	543.2	977.8
Cuu Long basin	81.5	146.7
Nam Con Son basin	1,126	2,027.8
Malay - Tho Chu basin	656.7	1,182.1
Total	2,407.40	4,334.40

(Vu Van Phai, 2007).

There are different types of coastal placer deposits like ilmenite with the estimated reserves of around 13 million tons and glass sand with the estimated reserves of hundreds of billions of tons. In addition, there is a huge amount of construction materials that can be exploited from the sea floor (sand and gravel for construction or backfilling, for instance) to replace the same materials which are being depleted gradually on the continent. There is also glass sand in Van Hai (Quang Ninh), Ba Don (Quang Binh), Cam Ranh (Khanh Hoa) with the reserves of billions of tons. In the continental slope - continental foothills and deep seabed there is a significant potential of iron - manganese nodules, multi-metallic mud that until now, it is still difficult to determine the reserves. Another promising mineral in Vietnam's seabed sediments recently discovered by geologists is burning gas (methane hydrate). The mineral resource which has the largest reserves in the sea is salt with very large reserves because the average salinity of seawater is about 32‰ and the coastline is about 3,500km long. This mineral is easy to be exploited and used for industry and human life (Vu Van Phai, 2007).

- Energy resources. In fact, tides, waves and wind are potential renewable sources of energy on Vietnam's seas and islands. The potential of wind power in Vietnam is huge. Particularly, the coastal strip of South Central and Southern regions are capable of producing up to 5x109 Kw/ hour.year. (Vu Van Phai, 2007)

4.1.3 Remarkable Resources

- Sea surface area. As mentioned, Vietnam's sea - island area is completely located in the tropical area and has an area of about 3.5 million km, year-round water does not freeze. This is undoubtedly a good condition for transport and trade to develop. The Vietnam Sea in particular and the East Sea in general are located in many important sea routes of the region as well as the

world; therefore, they play a huge role in the transportation of commercial goods, contributing much to Vietnam's economy as well as countries around the East Sea coast. (Vu Van Phai, 2007)

- Shore and island topography. There are over 4,000 islands in Vietnam's sea area, of which there are more than 3,000 islands in Northeast sea, more than 40 islands in the sea of North Central Coast, and the rest is in the sea of South Central Coast, Southwest sea, Paracel islands and Spratly islands. Based on the geographical position compared to the coast, these islands and archipelagos can be divided into 2 groups including islands and archipelagos near the shore (within the range from the contiguous zone to the inland), offshore islands and archipelagos (located in the exclusive economic zone). In fact, these coastal and island formations are very important in the development of the marine economy because this is a favorable condition to build infrastructure for seafood exploitation and processing seafood, sea transportation, tourism - sport - resort. In addition, a number of geological formations with aesthetic value can also be used directly for sightseeing. On the other hand, the coastal and island formations are also regarded as storages for other types of marine resources such as soil and creatures. (Vu Van Phai, 2007)

4.2 Sustainable Development of Vietnam's Marine Economy

4.2.1 Strategic Viewpoint on Vietnam's Marine Economic Development

Resolution No. 09-NQ/TW (2007) shapes quite clearly about the development strategy of Vietnam's marine economy. In reality, Vietnam's marine strategy focuses on the development of the marine economy: "until 2020, Vietnam will become a country with strong sea power and can get rich from the sea", and "until 2020, the marine and coastal economy will make up about 53-55% of the country's GDP. Social problems will be solved well and the lives of the people living in marine and coastal area will be improved that the income per capita in these areas will double the national average income". Viet Nam's marine economic development strategy targets key marine industries such as: (1) Development of marine economy; (2) Concentration on mineral exploitation and processing (focusing on oil and gas); (3) Seafood exploitation and processing; (4) Development of marine tourism and island economy; (5) Development of economic zones, concentrated industrial zones and coastal export processing zones along with development of coastal urban areas.

However, there are still some problems in Vietnam's marine economic development strategy:

- The management mechanism of Vietnam's marine economy is still inadequate. In Vietnam, there is not a unified management agency on marine economy. In fact, a sector or an industry is under control of a governing body that leads to overlap.
- There is not enough attention to strategic competition issues related to geographic and geopolitics. The delays or shortcomings of Vietnam in these issues will certainly cause many disadvantages for the country in economy, environment, national security and national sovereignty.
- The relationship between international integration and independence - autonomy guarantee is not mentioned deeply and specifically.
- There is no comprehensive mention on economic-defense relations.

4.2.2 Measuring Indicators of Sustainable Development of Vietnam's Marine Economy

4.2.2.1. Economic Indicators

- Shipping industry of Vietnam

Vietnam's marine fleet as of April 2016 had 1,895 ships (including 39 containerships with a capacity of about 20,000 TEUs) with a total capacity of 5.13 million GT, a total tonnage of 7.97 million DWT and the average age of 17 years. However, there was an unreasonable fleet structure with an excess of general vessels and a lack of specialized and container ships; the modernization of the fleet was low (Vietnam Maritime Administration, 2016). In 2018, the total transport volume carried out by the Vietnamese fleet was approximately 144.6 million tons, the volume of transferred cargo was around 153,079 million tons, an increase of 10.9% compared to 2017, accounting for 55.6% of the total transferred cargo of all modes of transport. The Vietnamese fleet has now been able to handle nearly 100% of domestic transport goods by sea, except for some specialized vessels such as LPG tankers. The total amount of cargo transferred through seaports of domestic waterway vehicles in 2018 was 171.6 million tons, a rise of 30.5% compared to 2017. There was an increase by 11.5% of the proportion of cargo through the seaport system of domestic waterway vessels during the period between 2016 and 2018 (Nam Phong, 2019).

The scope of activities of Vietnamese ships is mainly on short routes of Southeast Asia and Northeast Asia. Currently, the amount of cargo delivered by the Vietnamese fleet only accounts for 10% of Vietnam's export and import goods. The reasons are the lack of linkage among shipowners; shipowners and cargo owners (Nguyen Ha, 2019). In reality, a number of state-owned enterprises (VINALINES, PVN, Petrolimex, Vinacomin) are identified as key organizations in shipping industry of Vietnam. However, due to the impacts of world economy and shipping, management looseness, there is no reasonable strategy to develop a fleet served for long-term needs and the operational efficiency of these firms is still low. Therefore, they are restructuring under the direction of the Prime Minister and the Ministry of Transport (Vietnam Maritime Administration, 2016).

- Marine mining industry of Vietnam
- Oil and gas exploitation

Regarding to quantity exploitation. Vietnam has large potential amount of oil, with crude oil reserves of 4.4 billion barrels, equivalent to 0.3% of discovered world's oil reserves. The nation ranks 2nd in East Asia, 3rd in Asia and 28th in the world in terms of crude oil reserves. Moreover, it ranks 36th in the world in terms of scale of crude oil exploitation and ranks 4th in Southeast Asia in oil export (Minh Le, 2019). Vietnam began to extract crude oil in 1986 (Bach Ho field on the Southern continental shelf). As of December 31st, 2016, the Petroleum industry has exploited 370.33 million tons of condensate (of which, Vietsopetro Joint Venture Enterprise has exploited over 223 million tons). The amount of oil/condensate production peaked at over 20 million tons/year in 2004 and then it began to decline (Phuong Anh, 2019).

In addition to Bach Ho field, a number of other fields such as Ruby, Su Tu Den, Rang Dong are the main sources of crude oil, but so far, there has been a decline in production. Some fields have been exploited since 2010, but they have just small amount. In 2016, the amount of condensate exploited domestically reached 15.2 million tons. The decline in oil prices and keeping at a low level since the end of 2014 have directly affected oil and gas exploitation

activities of Petrovietnam in both domestic and foreign markets. A number of fields in Vietnam with small output such as Dai Hung, Song Doc, Thang Long-Dong Do, Hai Su Den-Hai Su Trang, Nam Rong-Doi Moi currently have to maintain exploitation activities in below breakeven. The fields being exploited in foreign countries such as Lot 433a-416a Algeria, Lot PM 304 (Malaysia) have lower output than being expected. Furthermore, the development of fields in Lot 67- Peru, Lot Junin 2-Venezuela faces many difficulties due to the sharp decline in oil prices, adverse changes in the investment environment and geological risks that adversely affect the projects' economic efficiency (Le Viet Trung, 2017).

Table 3. The coefficient of oil and gas increasing reserves offset against the exploited output in 2015-2018

Year	2015	2016	2017	2018
Increaseing reserves/ Exploited output	1,5	0,64	0,17	0,54

(Petrovietnam, 2019).

According to Petrovietnam (2019), although oil sources are forecasted to have much potential, the process of exploration and exploitation is facing many obstacles. According to a report of Petrovietnam (the key corporation of Vietnam oil and gas industry), in 2018, increasing oil and gas reserves reached 12 million tonnes of oil equivalent. Although increasing oil and gas reserves met the set plan, this was the 3rd year in a row that oil and gas exploration and exploitation face many difficulties. If compared with the development strategy target that the Oil and Gas industry set out in the country is 20-30 million tons / year and abroad is 8-12 million tons / year (total of 28-42 million tons / year) the actual increasing reserves is much lower.

The coefficient of increasing reserve offset against the exploited output in 2018 was at an alarming level (0,54 times). While in the period of 2011-2015, this coefficient reached 1.5 times - a safe level for sustainable development; to 2016, this coefficient was only 0.65 times; particularly, in 2017, it decreased to 0,17 times - a serious alert. Previously, every year, Petrovietnam drilled 30-40 exploration wells, invested 2-2.5 billion USD, increasing 35-40 million tons of oil equivalent; but from 2015 until now, the investment and foreign investment in searching and exploring only about 400-500 million USD, down 5 times compared to before. Currently, the existing gas supply in several fields like Lan Tay/ Lan D, Rong Doi Rong/ Doi Tay) are declining rapidly. There are a number of domestic gas fields expected to be able to supply a large reserves such as Ca Voi Xanh field, Lot B 48/95 & 52/97, and Ca Rong Do field. However, the progress of developing and exploiting these gas sources is currently facing many difficulties due to its large scale, high investment capital, problems in commercial negotiation and capital arrangement. Therefore, they are expected to supplement the domestic gas source only from 2021-2023. As a result, at the current rate of exploration and exploitation, Vietnam's total natural gas reserves (existing and will be supplemented) will only be enough to exploit in the next 18-20 years and after 2020, the country will have to import additional gas to fill the

shortage (Phuong Anh, 2019).

Regarding to contribution to the state budget. In 2018, Petrovietnam exceeded the production and business plan, especially in terms of the amount of reserve, oil and gas exploitation and financial indicators. Statistically, most production targets assigned by the Government reached the goal before the annual plan. The total oil and gas exploitation output in 2018 reached 23.98 million tons, exceeding 5% of the year plan. The Nitrogen production was estimated at 1.63 million tons for the whole year, exceeding 5.7% of the year plan. The total revenue of the Corporation in 2018 was estimated at 626.8 trillion VND, exceeding 96 trillion VND, equivalent to exceeding more than 18.1% of the year plan and increasing of 25.9% in comparison with 2017. Moreover, the amount of money paid to the state budget in 2018 was estimated at 121.3 trillion VND, exceeding 47.5 trillion VND, equivalent to exceeding more than 64.3% of the year plan and increasing of 24.3% in comparison with 2017. On average, Petrovietnam has maintained the annual revenue growth of 15-20%, contributing to 20% of the total state budget revenue and accounting for 8% per year of the total export turnover of the whole country (Petrovietnam, 2019)

- Coal mining (coastal area)

Regarding to quantity exploitation. The coal industry is oriented to give the priority to meet domestic demand, gradually reduce exports and export only coal that is not in need domestically. The Vietnam Ministry of Industry and Trade (2016) announced adjustment of the development plan in Vietnam's coal industry to 2020, considering prospects to 2030 with the following contents:

+ The average demand for investment capital for the coal industry is around 17.930 billion VND per year. Till 2020, it will be over 95,000 billion VND. In the period of 2021-2030, the average demand is estimated to be more than 172,000 billion VND. This capital is mainly focused on new investment, improving and expanding mines, investing in mining, processing and using coal by applying advanced technology, etc.

+ Regarding coal mining, the output of commercial coal produced by the whole coal industry in the planning periods was about 41-44 million tons in 2016 and is expected to reach 47-50 million tons by 2020, 51-54 million tons by 2025 and 55-57 million tons by 2030.

+ The coal industry must reduce the rate of coal loss exploited by the pitting method to around 20% by 2020 and below 20% after 2020; and decrease the rate of coal loss exploited by open-cast method to around 5% by 2020 and less than 5% after 2020.

Regarding to contribution to the state budget. Currently, the average annual coal production of Vinacomin (Vietnam national coal-mineral industries holding corporation limited) is around 40-45 million tons, which is 7 times as that of the company when it was established in 1994. Continuously from 2005 up to now, the equity ratio of pre-tax profit of the Corporation has always been from 32% to 42%. In 25 years, the total revenue of the corporation is 1,121,000 billion VND and the profit is 60,000 billion VND. The total amount paid to national budget has increased from 120 billion VND in 1995 to 17,800 billion VND in 2019. Over 25 years of operation, the Corporation has contributed 164,000 billion VND to the state budget (Vinacomin, 2019)

- Salt industry

At present, there are 21 coastal provinces producing salt in Vietnam but the main concentrated salt production areas are in several provinces like Bac Lieu, Ninh Thuan, Ba Ria-Vung Tau, Ho Chi Minh City, Ben Tre, Khanh Hoa, Binh Thuan, Ha Tinh, Nghe An, Nam Dinh, Thanh Hoa, etc. In general, salt production in Vietnam is still fragmented, backward with low and unstable output, high dependence on weather condition, making salt productivity and quality low. Therefore, salt farmers do not have high income. In 2018, the salt production area was 13,417 ha and the salt production reached 965,494 tons, an increase of 58.3% compared to 2017. Due to the high production, there was a situation of excess supply in the salt industry when the total supply in 2018 amounted to 1,686,014 tons. Due to the high amount of residual salt, more than 206,014 tons of salt were transferred to 2019 (Chu Khoi, 2019). Currently, Vietnam's salt industry has not met enough factors to develop stably and sustainably. The planned area for salt production is always changing. Many localities in the sea area are not interested in the salt industry because although they have to work hard in this industry, they still get low income. Moreover, the revenue from this industry for the state budget is insignificant so, local leaders have not paid enough attention to the direction and creation of investment capital for the development of this industry as well as support for the salt farmers.

- Marine tourism industry

Vietnam ranks 27th among 156 coastal countries in the world and is the country with large coastal area in Southeast Asia. Moreover, there are 125 beaches, most of which are beautiful and Da Nang beach was voted by Forbes magazine as one of the six most attractive beaches on the planet. Vietnam is also one of the twelve countries having the most beautiful bays in the world, like Ha Long Bay and Nha Trang Bay. Among 125 beaches and bays that are favorable for tourism development, there are 30 beaches that have been well exploited by localities for economic development, hunger eradication, and poverty reduction. In fact, there are some famous destinations that attract a large number of international visitors, contributing to about 70% of Vietnam tourism industry's revenue (Phuong Nguyen, 2016)

Developing marine tourism also contributes to the development of many other economic sectors. It also creates more jobs for coastal areas where there are currently about 21.2 million working-age people and contributes to the ensurance of security - national defense and protection of the marine environment (Nguyen Minh Phong, 2016)

- Vietnam's coastal economic zones

Statistics show that in the period of 2003-2005, the number of coastal economic zones was only three, but it increased to 11 in the period of 2006-2008. This is the period recognizing the boom in attracting foreign direct investment (FDI) into Vietnam. In the period of 2010-2015, five more coastal economic zones were established. In August 2017, Thai Binh coastal economic zone was established with an area of about 30,583 ha, becoming the 17th economic zone. Hence, in the Developing plan of Vietnam's coastal economic zones till 2020, only Ninh Co-Nam Dinh coastal economic zone has not been established. However, after more than 14 years of operation, up to now, Vietnam has not had any coastal economic zones constructed in accordance with the initial objectives set by the Government. In 16 coastal economic zones, there are 36 industrial parks and non-tariff areas established with the total area of 16,100 ha, of which the area of industrial land that can be leased is 7,800 ha, accounting for about 48% of the total natural land area. The scale of Vietnam's marine economy is just over 10 billion USD,

while the world's marine economic output is estimated at 1,300 billion USD. According to the estimation, the average economic scale (GDP) of the sea and the coastal area of Vietnam is about 47%-48% of the national GDP; of which the GDP of the marine-based economy is only about 20%-22% of the total national GDP (Vietnam Logistics review, 2017).

4.2.2.2. Socio-Cultural Indicators

- Safe houses for vulnerable coastal communities due to the increasing storms and floods

On November 24th 2017, the Vietnam Ministry of Agriculture and Rural Development in collaboration with the United Nations Development Program (UNDP) organized the Kick-off Workshop of the project “Strengthening resilience to the effects of climate change towards vulnerable coastal communities in Vietnam”. The project is funded by the Green Climate Fund with an amount of over 29.5 million USD and is implemented in 5 years (2017-2022). The goal of the project is to increase the resilience of vulnerable communities in the coastal areas to the impact of climate change in Vietnam, including building safe houses for vulnerable coastal communities due to the increasing storms and floods, increasing the coverage of mangroves providing a natural buffer zone between the sea and the coastal communities, providing reliable information related to climate risks to make plans. Accordingly, the project will build the total of 4,000 houses in safe locations with designs withstanding floods and storms; regenerate 4,000 ha of coastal mangroves as a buffer zone to prevent storm surges and sea waves; enhance the ability of the private and public sectors to access data related to loss, damage and climate in 28 coastal provinces in Vietnam. The project will benefit 28 coastal provinces with the focus on supporting Nam Dinh, Thanh Hoa, Quang Binh, Thua Thien Hue, Quang Nam, Quang Ngai and Ca Mau provinces. Selected coastal districts will receive benefits from making plans to prevent disasters through community-based disaster risk assessments (Thanh Trung, 2017)

- Development of healthcare in marine and island areas

The project of “Development of healthcare in Vietnam's marine and island areas to the year 2020” approved by the Prime Minister has created a legal corridor for ministries, branches and localities to invest in healthcare development, aiming to improve the quality of taking care of people's health, armed forces and laborers currently living and working in Vietnam's marine and island areas. This will help people feel secure to do business, live and maintain the sovereignty over the seas and islands of the country. After four years of implementation of the project, ministries, central agencies and localities have actively established steering committees to direct the implementation of the plan which are suitable to the characteristics of each locality and unit; and at the same time, give priority to investing in infrastructure and means of transportation for island districts, etc. As a result, people's awareness of self-protection of health has gradually been raised. People living on island districts and communes have enjoyed preferential policies on health insurance. Up to now, medical examination and treatment facilities in island districts, communes and coastal areas have gradually improved in terms of physical facilities, medical equipment, giving people the opportunity to access medical services with higher quality. In fact, many victims of accidents and serious illnesses were saved in time (Trung Hieu, 2017)

- Investing in science and technology for marine economic development

The national fishery database system (Vnfishbase) is within the framework of the Fisheries Administrative Strengthening Project funded by DANIDA of Denmark. This system is an online and synchronous database for management of registration information, fishing boat registration, fishing catch samples at fishing ports, fishing wharves, fishing licenses. This is a quite comprehensive database and can become an useful tool in fisheries management, fishing capacity, etc. The Central Management Board of the Coastal Resources Project for Sustainable Development signed a contract with FPT Information System Company Limited to perform the consultancy service of upgrading the national fishery database (Hoa Mai, 2017).

4.2.2.3 Indicators for Resource And Environmental Conservation

- Area and percentage of forest cover

The mangrove afforestation and disasters prevention project (funded by the Japanese Red Cross and the Danish Red Cross) has been implemented since 1994. According to the Vietnam Red Cross, the mangrove area planted by this organization accounts for over 4.27% of the total mangrove area currently exists in Vietnam and makes up about 25% of the forest areas in the provinces where the program is implemented (Minh Hue, 2017).

The Project on Protection and Development of Coastal Wetlands of South Vietnam (CWDP) was implemented in the provinces of Ca Mau, Bac Lieu, Soc Trang and Tra Vinh (Mekong Delta) in the period from 2000 to 2005 with a scale of 65,936ha (accounting for 3.9%). Although there has been investment in planting and protecting mangroves through the programs, the area of deforestation over the years is still larger than the regeneration area, including regeneration of natural forests and reforestation (Ngo Dinh Que, Vo Dai Hai, 2012).

- Investment in resource conservation, treatment and protection of marine environment

A marine protection area is regarded as a resource management tool used to slow down and eventually reverse degradation of coastal ecosystems. In order to protect biodiversity in general and marine ecosystems in particular, together with the international community in the global strategy, on May 26, 2010, the Government issued Decision No. 742/QĐ-TTg for approval of Planning of marine conservation zones system to 2020 with specific objectives divided into 2 phases:

- In 2010-2015 period: Completing the Vietnam's marine conservation zones system; formulating detailed plans, establishing and putting into operation more 11 marine conservation zones, and reviewing and adjusting the planning of 5 marine conservation zones that have been put into operation.

- In the 2016-2020 period: Conducting research and proposing the plan to develop and expand the marine conservation zones system; investigating, surveying, establishing and putting into operation a number of new marine conservation zones;

Till now, 12 marine conservation zones have been established and put into operation: Nha Trang Bay zone (Khanh Hoa province) (2001); Cu Lao Cham marine conservation zone (Quang Nam province) (2004); Phu Quoc marine conservation zone (Kien Giang province) (2007); Con Co marine conservation zone (Quang Tri province) (2009); Hon Cau marine conservation zone (Binh Thuan province) (2010); Bach Long Vi marine conservation zone (Hai Phong province) (2014); Ly Son marine conservation zone (Quang Ngai province) (2015). Four marine conservation zones which were planned in detail are in the process of

finalizing and submitting papers to the competent authorities for approval of establishment: Hon Me marine conservation zone; Nam Yet marine conservation zone; Phu Quy marine conservation zone; Hai Van - Son Cha marine conservation zone (Kim Phuong, 2017).

5. General assessment towards sustainable development of Vietnam's marine economy

5.1 Achievements

- In terms of economics
 - The marine and coastal economy have made positive changes and contributed greatly to the overall national economic development.
 - Vietnam has enhanced investment, upgraded and regenerated coastal infrastructure to create a driving force for coastal economic development, in association with the protection of national sovereignty at sea.
 - Vietnam has paid attention to investment and promotion of agricultural production in coastal areas.
 - Vietnam has promoted the development of economic zones, industrial parks and special economic - administrative zones to create motivation for the development of coastal economic zones in Vietnam.
 - Tourism in coastal areas and islands has been increasingly developing.
- In terms of society
 - Vietnam's coastal economy has a relatively high growth rate and greatly contributes to the national renewal process, creating a solid foundation for the process of protecting the sovereignty of the Vietnam's seas and islands.
 - Vietnam has exploited geographic and geopolitics to promote the development of its seas, coastal areas and islands.

- In terms of environment

Exploiting coastal mineral resources based on the principle of both economic development and environmental protection

5.2 Limitations

In addition to the achievements, in recent years, the development of marine economy and conservation of the sustainability of Vietnam's sea still have had to face many challenges and limitations. In case that these limitation is addressed slowly or not resolved, it will greatly affect the efficient and sustainable development, as well as the industrialization and modernization ability of marine economic sectors in Vietnam:

- In term of economics
 - The scale of marine economy is still small and not compatible with its potentiall, the industry structure is unreasonable and Vietnam has not had enough conditions to reach out the international waters.
 - The infrastructure of marine, coastal areas and islands is still weak, backward, fragmented with unsynchronized equipment; so, the usage effectiveness is low. Seaports are lack of high-speed road system operating along coastal areas to connect cities, economic zones, industrial parks and coastal airports into a continuos marine economic system.

- The situation of inefficient and unsustainable exploitation and use of sea and islands due to spontaneous exploitation, failure to comply with seas and islands planning have raised many conflicts of interests in multi-sectoral use in coastal regions, seas and islands.

- In term of society

- The systems of marine scientific and technological research institutions, training institutions providing human resources working in marine economy, monitoring institutions, forecast and warning centers about maritime disasters, searching and rescuing centers, etc, in coastal areas are small and rudimentary.

- New advanced methods of marine management are still studied and applied slowly such as: marine space management, planning of marine use including islands and coastal areas as planning of land use applied on the main land. Particularly, little attention is paid to research advanced marine technology.

- In term of marine environment

- The marine environment has been changed in a negative way. In fact, more and more untreated waste from river bassins and coastal areas are poured into the sea. Some coastal areas are polluted and there are more phenomenons of red tide appearing on a large scale, etc.

- Marine biodiversity and aquatic resources have declined. Moreover, important marine ecosystems (coral reefs, mangroves, seagrass beds) have been degraded and reduced in area.

- In addition to frequent sea disasters, Vietnam is also one of the five countries affected strongly by climate change and rising sea level, firstly in coastal areas and small islands.

5.3 Causes of Limitations in Sustainable Development of Vietnam's Marine Economy

5.3.1 Subjective Reasons

- The awareness of the role and position of sea and marine economy of all levels, sectors, coastal localities and people is inadequate. Additionally, the concept of "blue sea economy" has not yet been understood and applied consistently.

- The fast approach to exploit marine resources is a common phenomenon in the marine economic sectors that pays much attention to output, quantity, but little attention to quality, long-term benefits and resource types.

- The seas, islands, and coastal areas of Vietnam are still mainly managed by each industry through laws and sectoral policies.

- The inspection, control, granting and revocation of licenses of marine resources use and exploration are slowly implemented in the field of marine resource management.

- In the development model of coastal economic zones in particular and the marine economy in general, there is a lack of clear institutions; the level of technology is low and the marine economic zones are not attractive to large international investors.

5.3.2. Objective reasons

The South China Sea is the site of a long, complicated and unpredictable sea and island dispute due to unilateral claims, irresponsible actions, and shortage of complying law of different countries.

6. Suggestions to Promote Sustainable Development of Vietnam's Marine Economy

- Strengthening the laws and policies on marine economic development

Special mechanisms and policies should be applied to attract investment and prioritize sustainable economic development such as applying sustainable economic models (ecotourism, agro-forestry ecology, clean mining, etc) to reduce resource losses and waste and environmental degradation; adding resource and environment's costs to production costs, imposing punishments for acts of damaging natural resources and environment such as fishing by using mine or electricity, cutting mangroves and so on.

- Community-based environmental management

It is necessary to implement a project to apply the model of management and protection of mangrove ecosystems in aquacultural and fishing associations, veterans associations, and women's associations, etc. Based on the success of this project, the government should expand community-based management of other types of resources.

- Strengthen environmental inspection and control activities

It is indispensable to promote environmental inspection and control activities with focus on resolving hot environmental issues; thereby, update new regulations on environmental protection, guide localities and enterprises to complete environmental dossiers and procedures, and strictly handle violations causing environmental pollution. In addition, it is necessary to continue to consolidate and complete the organizational structure on environmental protection from the central to local levels, especially, add as soon as possible the specialized inspection function to Sub-Department of environmental protection, and recruit regular environmental management officers at district and commune levels to meet management requirements in the near future.

- Scientific and technological methods for sustainable development of marine economy

- Constructing and maintaining the operation of natural resources and environmental observation and supervision stations to inspect environmental quality, changes of ecosystems, habitats, genetic resources, etc. Building and sharing databases, websites to meet the requirements of rational use of natural resources, environment and sustainable development in Vietnam's marine areas.

- Researching and implementing models of sustainable use of marine natural resources and environment such as eco-tourism model, eco-aquaculture model, eco-agricultural model and so on.

- Propaganda and education solutions

In reality, people living in Vietnam's marine areas rely largely on the exploitation and use of coastal and marine resources. Simultaneously, the exploitation and use of natural resources directly impact on natural resources and environment of the sea. Therefore, propaganda and education solutions for people in the regions about the rational use of resources and environmental protection to cope with climate change, improve natural disaster prevention capability, and reduce damage level are extremely critical solutions. It is necessary to educate people to be aware of protecting the ecological environment on the basis of perceiving the importance of natural resources and environment towards their lives and the surrounding community.

Besides, it is necessary to strengthen the training of managers at commune, district and

provincial levels about knowledge and skills of sustainable use of natural resources and environment, environmental protection, natural preservation, natural disaster prevention, response to climate change, etc.

7. Conclusion

The marine economy is particularly critical in attaining the goal of making Vietnam a country with strong sea power and can get rich from the sea, and at the same time, protects marine sovereignty. However, to achieve this goal, it is necessary to synchronously execute solutions to overcome shortcomings and limitations in the process of sustainable development of marine economy.

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