East Sea - Natural Resources in Vietnam

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Abstract—In Vietnam, status is mentioned a lot in recent economic and management documents. The scientific basis of the position resources for socio-economic development is still a new issue in our country, and it is not accessible in the world. However, this is a significant direction that the right awareness will create a new perspective on the rational use of resources, spatial organization, and planning of rational and sustainable socio-economic development. Vietnam is particularly crucial in Southeast Asia thanks to a territory stretching over three thousand kilometers on the western edge of the South China Sea and a territorial sea area of over one million square kilometers, three times the area of the territory. The Vietnam Sea is located in a tropical monsoon region, with world-class rivers that the basin covers six countries. The Vietnam Sea plays an essential role in the environment, the ecology of the East Sea and the region, an exclusive transitional zone between the Indian Ocean and the Pacific Ocean in terms of biological and maritime geography. The development of an industrialized and modernized economy must inevitably be linked to the maritime potential of the ocean. This article presents the initial findings on the coastal and coastal status of Vietnam.

Index Terms—East Sea, Natural Resources, Position Resource.

I. INTRODUCTION

Vietnam is a coastal country located on the West Bank of the South China Sea, with critical geopolitics and geopolitics. With a coastline of over 3,260 km stretching from North to South, it is ranked 27th among 157 coastal countries, island nations and territories in the world. The index of the length of coastline on the land area of our country is approximately 0.01. Of the 63 provinces and cities of the country, 28 provinces and cities have seas, and nearly half of the population lives in coastal provinces[1].

The South China Sea is one of the 10 most extensive maritime routes in the world. Heavy traffic ranked 2nd in the world (after the Mediterranean). Every day, about 200 - 300 ships of 5,000 tons or more travel (excluding ships of less than 5,000 tons), accounting for a quarter of the world's maritime traffic[2]. The South China Sea area has important straits for many countries, of which Malacca Strait is the second busiest strait in the world (after the Strait of Hormuz). The South China Sea is essential to many countries in the region in terms of geography - strategy, security, maritime transport, and economy[3]. With the US as the primary operational route for the Seventh Fleet, 90% of the US and allied cargo ships through the South China Sea. With China importing 160 million tons of oil annually, 50% of the imported oil, and 70% of the goods going through the East Sea. With Japan 70% of oil imports and

42% of exports exported through the South China Sea[4].

For Vietnam, Vietnam's waters and coasts lie on the arterial maritime and air route between the Indian Ocean and the Pacific Ocean, between Europe, the Middle East, and China, Japan and countries in the region. The natural conditions of the Vietnamese coast are of great potential for Vietnam's maritime transport industry[5]. Along the coast of Vietnam, many port construction areas are identified, including some places where deep-sea ports can be built such as: Cai Lan and some points in the areas of Ha Long Bay and Bai Tu Long, Lach Huyen, Dinh Vu, Cat Hai, Do Son, Nghi Son, Cua Lo, Hon La, Vung Ang, Chan May, Da Nang, Dung Quoc, Van Phong, Cam Ranh, Vung Tau, Thi Vai[6]. In the south, the port is medium-sized as Hon Chong, Phu Quoc ... In addition to the formation of a seaport network, roads and railways along the coast and connecting with inland areas (especially Trans-Asia routes) will allow the sea and Our country's coastal areas are capable of transporting imported goods to all parts of the country quickly and smoothly.

Marine resources, according to traditional methods, are classified into different groups and categories. By its nature, marine natural resources are divided into biological and non-living resources[7].

Abiotic resources include: Energy resources (heat radiation, sunshine, wind, ocean waves, tides); Water resources: freshwater (rainwater, surface water, groundwater), brackish water, saline water (volume, volume, depth, flow and basic physical and chemical properties); Wetland resources (groups with vegetation, no vegetation, frequent and man-made inundation); Mineral resources (metals, non-metals, construction materials, precious stones, burnt minerals, etc.)[8].

Biological resources include: Biodiversity: (species diversity, fauna, ecosystem diversity, genetic resources, rare and endemic species, species listed in the Red Book); Natural resources of capture fisheries, wild-caught belonging to groups of fish, crustaceans, mollusks and other species; Aquatic resources for aquaculture include fish, crustaceans and mollusks reared in intertidal areas, cage culture, water platforms, food, and ornamental animals; Breeding sources, breeding grounds to maintain marine and coastal fisheries[9].

According to renewable capacity, marine natural resources are divided into renewable and non-renewable resources, consumable resources, and non-consumable resources[10]. Renewable resources are usually biological resources (shrimp, fish, mangroves, etc.), which can be newly created and restored to the extent that they are removed if not overexploited[11]. Non-renewable renewable resources include soil and energy resources such as wind, tides, waves, and solar radiation. Typical non-renewable resources are wetlands and minerals[12].

II. THE LITERATURE OF POSITION RESOURCES

Nowadays, natural resources are no longer understood according to traditional thinking, only material types are taken out and valid for use for specific economic purposes, but have been understood to be all the factors of self. Of course, it can be used in various forms, or not at all, but the existence of it is beneficial to humans. Such a concept can easily be seen that a beautiful natural landscape is a valuable resource, which is not renewable if destroyed, but can be used forever if the exploitation of the economic value of it makes sense. Meanwhile, minerals are non-renewable resources, renewable resources, and thermal energy, wind, tides can be considered endless[13].

According to the traditional understanding, many great benefits, especially the development of infrastructure and key economic zones, are brought back from spatially synthesized elements, phenomena, and processes. Land and sea areas not associated with any specific traditional resources only considered development advantages. It is the source of the lack of fundamental thinking in the organization of the territory of socio-economic development planning. In fact, in some development plans, the basis of economic decisions is not based on the recognized significant resources, but on several factors, considered advantages. Naturally, it is assessed to be unsystematic and depends on the random awareness of planners. The most important economic decisions of an area are based on spatial resources (status) but are not officially recorded. This situation is not only in Vietnam but also in many developing countries and is gradually being recognized with the healthy development of economy, management and science, and technology[5].

The position resource (space) contains all four types of resources such as solar, wind, agricultural, fishery, and forest resources (including biodiversity conservation potential, etc.). It relates to all human activities related to resource use, such as building houses, building infrastructure, and transport. Therefore, the position is considered as a critical form of resources. Similar to this division, Sien Chia-Lin (1992) divided Singapore coastal resources into three groups: coastal land and sea space, renewable resources, and non-renewable resources [13].

In this division, in the marine resource system, marine position resources also play a crucial role. These are marine and coastal space, floating and subterranean including creeks, wharves, coastal land, peninsulas and islands, sea sand, stone shelves, caves[14]. For example, a deep, enclosed bay with no traditional resources, but it can be used as a deep-water port has excellent economic benefits. Marine position resources (space) are not only a natural source, but also have human resources elements, including historical, archeological, cultural, community structures[15].

Vietnam's maritime resources have great potential for socio-economic development benefits such as transport and port development [4], tourism and services [3], and marine fisheries [2], industrial development, infrastructure and urbanization, and other economic sectors. To develop these sectors, firstly, it is necessary to use spatial factors (islands, seas, coastal waters) and elements of the specific geographical position of position resources, then rational use. Biological and non-living resources are located in the

development space (free) and outside development space (attraction)[16].

Development of marine natural reserves is a form of using indirect values or maintaining values to gain and save marine position resources. The benefits and importance of marine protected areas are enormous, including direct economic benefits (ecotourism, development of resources in transition areas), indirect benefits (culture, science), and education) and spillover benefits (maintaining seed sources for adjacent fishing grounds, a shelter for migratory animals, etc.).

Position resources are particularly necessary for national security and national defense at sea. Vietnam's coastal and coastal space is a form of military resources, fully exploited, and used in the war against foreign aggression[17]. The arrangement of defense, as well as the formation of combat plans, must firstly rely on factors of the position such as natural characteristics, especially terrain and geographical position. Islands, estuaries and continental shelves are precious for delimiting national boundaries and sovereignty at sea.

III. THE ESSENTIAL POSITION OF RESOURCES OF SEA AND COASTAL AREAS IN VIETNAM

With the viewpoint above, it is possible to determine that Vietnam's coastal and coastal position resources are hydrographic or geographic systems with all three ground components (or bottoms), water and air, within national sovereignty, including littoral zones [14, 16], islands, littoral waters, and offshore waters. To the extent limited, this article only introduces location resources as coastal and island strata with an overview of the value of several specific positions.

A. Areas of river mouths

Located in the hot and humid tropics, heavy rain and developed a weathered crust, Vietnam's river system is developed quite dense and has significant water and sediment loads. Every year, the rivers bring to the sea about 870 billion cubic meters of water and 250 million tons of sediment, which are distributed in 10 primary river basins, the rivers of Quang Ninh, Red - Thai Binh, Ma, Ca, and rivers. Gianh - Quang Tri - Huong, Thu Bon, Tra Khuc, Ba, Dong Nai, and Mekong rivers. The river flows into the sea through the 114 gates (river mouths). Rivers flow into the sea through one or more gates.

Estuarine areas can open in open sea (estuaries of Central and Mekong), into large bays (Red river mouth opens into Tonkin gulf), small bays (Han estuary opens into Da Nang bay) or opening into lagoons (Huong river estuary opens into Tam Giang lagoon). The estuarine region's characteristics depend on the nature of the basin, water flow, sediment from the river, and characteristics of wave dynamics and coastal tides. Dominance of river, wave, or tidal dynamics factors significantly influenced the morphology and degree of closure of their structures [18].

Estuarine areas are divided into two types: delta and funnel-shaped. Vietnam has two major deltas, the Red River in the north and the Mekong in the south. In the Central region, there are small deltas like Ma, Ca, Thu Bon, Da

Rang, etc. Large deltas formed on the sagging ground of the Cenozoic basins. The Red River Delta has an area of about 17 thousand km². Every year, the Red River system releases 137km³ of water and 125 million tons of sediment. For nearly a century, the Red River Delta encroached to the sea an average of 28m / year, in some places 100 120m / year, such as in Ba Lat and Day estuaries[19]. The largest Mekong Delta in Southeast Asia (35,000 km² of Vietnam), At the tip of Ca Mau, the speed of sea encroachment is 150m / year. The current longshore moves the sediments to the southwest accretion so Ca Mau peninsula expands quickly to the sea, creating a giant protruding nose deep into the Gulf of Thailand.

The Estuary is an area downstream of the river, often in the form of a funnel, submerged without compensation for sediments, and the tide plays an important role. The significant and typical funnel-shaped estuaries of the world such as Xen, Jironda (France), Thame, Mersey (England), Rein, Maas (Netherlands), Potomac (USA), La-Plata (South America), Duong Zi (China)[20]. In Vietnam, the funnel-shaped estuaries are often located on the shorelines with high amplitude tides, typically the Dong Nai estuary on the northern edge of the Mekong Delta and the Bach Dang estuary on the edge of the northeastern Red River Delta.

Therefore, the two funnel-shaped estuaries have a similar natural, natural resources, and socio-economic development potentials for Ho Chi Minh City - Vung Tau and Hai Phong. With the potential resource position of a funnel-shaped estuarine area such as semi-enclosed water structure can limit large waves from the sea, high amplitude tides, low sedimentation capacity, and extensive creeks thanks to dynamics tide dominates to create deep erosion, the funnel-shaped estuaries are often the places of development of significant ports and associated industrial, maritime, service and tourism activities[21]. Many of the world's largest seaports are concentrated in funnel-shaped estuaries, typically Rotterdam of the Netherlands, Liverpool, and London of England and La Havre of France, etc.

Saigon Port and its benefits are only a small part of the port's potential in the Dong Nai funnel-shaped estuary, recently being promoted with the development of Sao Mai - Ben Dinh port clusters, Thi Vai - Phu My and associated industrial parks. Hai Phong port cluster is connected to the estuary area of Bach Dang funnel, after ups and downs due to sedimentation, now it is confirmed with the Government's decision to build the Lach Huyen gateway port[22]. Hai Phong is the gateway to the sea in the north of the country and Ba Ria Vung Tau is the gateway to the sea in the south in relation to the development of critical economic regions Hanoi - Hai Phong - Quang Ninh in the north. and Ho Chi Minh City - Ba Ria - Vung Tau in the south.

B. Coastal lagoons

Coastal lagoons are a type of coastal, brackish, saline, or super saline water body, usually of a long shape, separated from the sea by a system of sand dikes and connected to the sea. The lagoon gates may be one or more open regularly or permanently closed. Coastal lagoons are present in many places, accounting for about 13% of the world's ocean coastline. In Vietnam, the lagoons are concentrated in the Central Region, which is rich in coastal sand deposit, and

strong wave dynamics, and the tides are usually small. From Thua Thien - Hue to Ninh Thuan, there are 12 typical lagoons, the total area is only about 458km², distributed over about 21% of Vietnam's coastline[23].

The Tam Giang - Cau Hai lagoon system runs for 70 km along the coast of Thua Thien Hue province, with a width of 216 km², a small depth, an average of 1-2m, rarely to 4-5m. However, the door and the area close to the estuary can reach a depth of 10-15m. It is a low latitude, hot and humid coastal lagoon, the largest in Southeast Asia, of the world's most significant type and typical for the tropical closed type. The lagoon system has great potential for natural resources for socio-economic development. For Thua Thien Hue province, this is the gateway to the sea, one of the four natural regions mainly hill, plains, lagoons and the sea. The lagoon system is directly related to the life of one-third of the provincial population and has an essential influence on the entire socio-economic life of the province, indirectly related to the formation and development of Hue city. The system plays an essential role in the fields of fisheries economics, transportation, agriculture, and tourism services and is closely related to the environment and coastal disasters[15].

The most significant value resource of the Tam Giang - Cau Hai lagoon system is to create a living environment for over 30,000 inhabitants on and around the lagoon, related to an area of 89,000 ha including 26,000 ha, lagoon water surface, 49,000ha of plain land and 19,000ha of sandy coastal land. The presence of the lagoon has been harmonized to create freshwater for agriculture and daily life, creating a land basis for infrastructure construction and residential areas[24].

This is a pleasant place to develop the logistics structure for fishing on the spot and at sea. The lagoon system has an exceptional value for biological resources with many species of valuable species exploited and cultivated and is likely to become a natural reserve, a biosphere reserve or wetland of international importance. The valuable lagoon is an anchorage area to avoid storms (whenever there are storms, about 5-7 thousand vessels of large and small boats enter the lagoons) and develop waterway transport, along with rivers, creating a network. Inland waterways are essential and constitute a complete system of waterway traffic[25]. Tan The port is capable of developing to allow ships of 3,000 tons to dock. This is also an ideal tourist area, has many unique features, and has excellent ability to develop eco-tourism along with forms of entertainment. The lagoon area also has many archaeological, historical, cultural, customs, festive, etc. relics. Contribute to development to tourism. The lagoon system contains aesthetic and spiritual values, creating cultural characteristics with specific identities expressed through customs, practices, and festivals associated with beliefs and production labor practices. This is an excellent place to visit and practice on environment, ecology, and resources and is valuable for scientific research in the fields of geomorphology - geology, shore dynamics, biology, and ecology.

C. System of bight, shelter, and gulfs

Vietnam's coastal gulfs and shelters are understood to be part of the sea that is concave on the continent or blocked by

the islands forming a closed water area to a certain extent in which the sea dynamics dominate. Vietnam's coastal bays are divided into 3 basic levels: Level 1: gulf (gulf - Gulf of Tonkin and Gulf of Thailand); Level 2: coastal bay (bay - Ha Long Bay, Da Nang Bay etc.); Level 3: Vung (bight and shelter - Vung Ro, Vung Xuan Dai, etc.) Excluding enormous gulf, in Vietnam, lagoons and coastal bays have a depth of not more than 30m. The puddles with an area of less than 50 km², the coastal bays with an area of 50 km² or more, a total of 48 pools, bays with a total area of about 4000 km². Coastal coasts are distributed in 4 geographic regions: the northern coast, the North Central Coast, the South Central Coast, and the southern island regions [18, 19].

Bai Tu Long is a gulf with enormous position resources. The bay has an area of 560 km², the average depth of 4m maximum 12m, in Quang Ninh province, close to the Chinese border waters, mainly in Van Don district. The bay is created by a barrier island, semi-enclosed structure, original rocky bank. On the bay, there are thousands of limestone and terrigenous islands. The bay has enormous potential for port development, aquaculture, tourism, nature conservation, and defense. Priority relations for economic development - natural conservation - security and defense for Bai Tu Long Bay were determined to be of equal importance. The bay's economic development priority structure is determined as tourism - service (in mind is ecotourism); traffic - port; fisheries (with a focus on ecological farming) and agroforestry on islands and along the bay. The highest proportion of tourism and service development investment priority (35%). Ecotourism is selected as the critical tourism type besides diversifying other types. Important tourism objects are the landscape and diverse ecosystems of a bay - island region, cultural and historical relics, and economic and cultural activities. Transport - the port is oriented to prioritize the second development (30%) but plays a very important role in the system of northern port groups thanks to the potential of the access channel to Cua Ong, Nam Cau Trang, and Hon ports. Net, Cai Rong (Van Don), Mui Chua (Tien Yen), Van Gia (Vinh Thuc) and Van Hoa port. To develop fisheries in the third priority position (25%), along the direction of restoring and maintaining resources for coastal areas, protecting marine biodiversity; developing logistics for offshore fishing, not processing industrial-scale products to avoid pollution; To develop aquaculture with high economic value by cages and natural rearing on tidal flats, minimizing the embankment. Agro-forestry development is in the lowest position (10%). Reasonably and sustainably, no expansion of agricultural land, natural protection, and restoration of indigenous vegetation, protection of mangrove vegetation from destruction to aquaculture farming. Only exploit forests on the island for ecotourism and special-use forests.

UNESCO has recognized the Ha Long heritage site for its aesthetic value (landscape), geological value, and forthcoming marine biodiversity value. Nearby Bai Tu Long Bay also has all three of these natural values. Eligible to expand Ha Long Bay heritage area to Bai Tu Long bay. Bai Tu Long Bay has a unique military resource value thanks to a system of large and small islands outside the northeast-southwest direction, deep creeks, and caves. In Vietnam's

coastal defense strategy, Bai Tu Long - Ha Long Bay projects the northeastern gateway, near the Vietnam - China border, in a sensitive and essential position. The strategic location of the bay is determined based on the value of military resources used for coastal defense, dominance, security control, and support conditions to ensure combat contracts.

D. Island system

Vietnam has about 3,000 coastal islands with an area of over 1600 km², of which over 66 islands have about 155 thousand people living, concentrated mainly in the Northeast coastal area [1, 20]. Except for Phu Quy island separated from the modern continental shelf through a deep water basin and atolls of Spratly and Paracel Islands in the East Sea, all islands near the shore, including Bach Long Vy, Con Dao, and Phu Quoc are within the continental shelf. The bottom of the sea around the islands often exposes the original rock, which is the foundation for developing coral reefs. The island has many valuable values such as residential land, ecotourism, construction of marine exploitation infrastructure. Some islands like Tho Chu, Con Co, Dao Tran, etc. valuable is the baseline to benefit the territorial sea for the country.

The two offshore archipelagoes have many and long-term benefits for the country. Hoang Sa archipelago is located on an underground plateau of more than 100 thousand km², including more than 100 floating islands, rocks, shallow shallower, over 60 named places (with 16 floating islands) belonging to 3 large clusters, Tongue. Sickie, Vinh An, and Malec - filter. Truong Sa archipelago is located on an underground plateau of more than 300 thousand km², including hundreds of floating islands, rocks, shallow beaches and reefs with over 130 named places (with 23 floating islands), belonging to 8 large clusters. Gemini, Thi Tu, Type Ta, Nam Yet, Survival, Binh Nguyen, Truong Sa, and Expedition [16].

Con Son archipelago consists of 16 large and small islands, mainly composed of intrusive and erupting magmatic rocks, 185 km from Vung Tau, about 83 km from the mouth of Hau river (Can Tho), about 75 natural areas, 15km², the coast is 66km long. Con Dao is the largest island of 51,52km² [10]. The coast is 200km long, with many beautiful beaches such as Dat Doc, Bai Canh, Dam Trau, Hon Cau, Hon Tre, etc. Con Dao is famous for historical relics of the anti-French and anti-American periods.

Con Dao has excellent potential for marine conservation, on the list of 15 marine protected areas approved by the Government. Existing Con Dao National Park was established under the Prime Minister's Decision No. 135/1993 / QD-TTg of March 31, 1993, covering a total area of about 20,000 hectares, including nearly 6000 hectares of island land and 14,000 hectares. Biodiversity is very high with 2,083 species of creatures, including 650 species of terrestrial plants, 108 species of mammals, birds, reptiles and amphibians and 1325 species of marine flora and fauna. Many species have high economic value, especially 44 species are recorded in the Vietnam Red Book such as Dugong, Sea turtles, etc. [11]. Con Dao has the strength to develop bathing and resort tourism, ecotourism (diving, fishing, climbing, visiting the forest, marine life ...)

and visiting historical sites. Con Dao is also the center of fishing grounds in the South, only 60km from the international maritime route. Con Dao will be located at the crossroads of international maritime transport when the KRA canal in Thailand opens connecting the Indian Ocean and the Pacific Ocean. According to the plan, 4 ports will be built in Ben Dam: a seafood port in the deepwater area of 6 - 8m has been completed, a port of Petroleum Technical Services in the water area of 8 - 15m and a Naval port in the port of Ben. Dress. Con Dao will develop into a high-quality economic-tourism and service area, by 2010, Con Son, Ben Dam, and Co Ong towns will be built with a population of about 14,000 people. By 2020, a modern urban center will be formed; the whole island is a significant urban. Con islands should be considered as the focal point of marine nature conservation, and only marine nature conservation will create opportunities for tourism and services. Therefore, the urban area in Con Dao needs to be an urban eco-urban model.

IV. CONCLUSION

Along with the needs and potential of socio-economic development, the role of Vietnam's maritime resources is increasingly prominent and occupies a leading position in the marine resource system for its values, and the great benefits in many ways that this resource group brings. Using position resources is the organization of marine space and marine economic development planning, which was previously considered as an advantageous factor, i.e., an auxiliary element and is not considered a resource.

Marine position resources are a very new issue in terms of scientific basis, research methodology, and rational use for sustainable development and need to be invested appropriately for research and evaluation. Practical lessons, both successes, and failures show that there is a need for a better understanding of this particular resource.

The rational use of position resources for sustainable development has great opportunities, but there are still many challenges and challenges, especially the pressure of economic development, population, and impacts of natural disasters. The problem that needs to be solved for the rational use of marine position resources in Vietnam is to conduct the development and implementation of integrated coastal and coastal management programs.

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