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## BUILDING SCIENTIFIC BASIS FOR THE TERM OF “POSITIONING RESOURCES” AND PROPOSING METHODOLOGY FOR IDENTIFYING AND EVALUATING THE POSITION’S VALUE OF VIETNAM COASTAL ISLAND SYSTEMS

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**Abstract.** Vietnam coastal island systems play important position in socio-economic development and security, defense of the country. Among traditional resources, “position” or called as “positioning resources” is considered as a special resource. Indeed, “positioning resources” is a new term not only in Vietnam but also in other countries. As a result, this concept has always been controversy and on which full agreement in terms of scientific basis has not yet been reached. In fact, it is important to increase the understanding and awareness of coastal islands’ position, which helps to develop a new approach to evaluate the real value of these islands and to make a decision on how to utilise resonable resources. This report continues to bring out the meaning of position and its scientific basis, methodology for identifying and evaluating the position’s value of Vietnam coastal island systems.

**Keywords:** Position, scientific basis, methodology, coastal islands.

### INTRODUCTION

“Positioning resources” is not only new to Vietnam but also to many countries in the world. In fact, identifying and applying a “position” of marine island has brought tremendous benefits to the economic development of the country, especially in service economy development. Typically in the case of Singapore, the island nation with a prime location in the East Sea has developed the economy based on the seaport system. Therefore, proper awareness and identifying the “position’s value” of regions or areas will contribute to a new approach to the rational use of resources, spatial planning and socio-economic sustainable development in marine islands.

With over 2,773 marine islands covering an area of about 1,721 km<sup>2</sup> [1], the system of coastal islands in Vietnam is extremely important in terms of security, national sovereignty and socio-economic development of the country, especially densely populated islands with many beautiful landscapes such as Phu Quoc, Tho Chu, Con Dao, Phu Quy, Van Don, Ly Son, Bach Long Vi and Cat Ba. These islands serve not only as developing nuclei in the waters of more than 1 million km<sup>2</sup> but also as transshipment terminal, which play the role of interconnections between the coastal strip and the outer waters. Therefore, it is important to identify and evaluate the value of the island’s positioning resources in order to create new perspectives for the exploitation and rational

use of resources, spatial planning and socio-economic sustainable development [2–4].

This paper will focus on clarifying the comprehension of “positioning resources” of marine islands, the methodology for identifying and quantifying the value of coastal island’s positioning resources in Vietnam, and to supplement the scientific basis and the methodology for quantifying the value of “position resources” of the Vietnamese coastal islands.

### **THEORETICAL BASIS FOR THE POSITIONING RESOURCES OF COASTAL ISLANDS**

An area or an island has a certain role and value, which can be used for a variety of development purposes. Over the past decade, the term “positioning resources” has been referred by many scientists in the country to assess the potential, strength of a nation or specific territory [1–5]. They believe that the “positioning resources” is one of the important types of resources, it contributes to creating a competitive advantage and a premise for the economic development of the region and the country. However, it is still a relatively new concept in Vietnam and its scientific basis is being shaped and discussed by scientists, there has been no agreement on scientific terminology so far.

In order to build a scientific basis for “positioning resources” of marine island in Vietnam, some authors have laid the foundations for this concept when studying the value of natural resources in the Vietnamese coastal area and marine island [6–11] and focus on comprehensive assessments of recent scientific and practical backgrounds [1–5, 12]. A number of researches on the positioning resources of Vietnamese marine islands can be referred to as Nguyen Chu Hoi [5]. In his study of marine environmental resources, he argues that the “positioning resources” is comparative advantage in terms of geography, the ability to exploit the non-material and material values of a given territorial unit. Meanwhile, Tran Duc Thanh et al., [13] conceive of positioning resources with broader implications “positioning resources is a relative comparison

of position in society or in the nature of a human being, a community, an administrative unit, a country, a coalition, or a spatial area”. Relating to the island’s position, he considers the “position” is a comparative correlation of the natural geographic location of a space that can be exploited into environmental, economic and political benefits. This includes the challenges that the region might face. In the definitions above, the “position” is considered a form of resource. Taking into account the islands and archipelagos, Le Duc An et al., [14] perceive that the “positioning resources” includes the benefits and values of island’s space, shape, distribution and arrangement. These values are described by four components: Position, shape, distribution, and arrangement with 16 factors involved.

Although there are many perspectives on the study of “positioning resources” of marine islands in the country, there are no documents available abroad using this term. Chia Lin Sien [15] implies a specific resource when studying Singapore’s marine resources. He considers space and location as resources to allude the prosperity of the Singapore nation by leveraging and promoting geographic advantage in Southeast Asia and around the world. In spite of this, Vietnamese researchers believe that the “positioning resources” is far more extensive than the spatial resource in foreign documents, which includes benefits from not only geographical location but also spatial properties.

### **ESTABLISHING THE CONCEPTUAL FRAMEWORK FOR “POSITIONING RESOURCES” OF MARINE ISLANDS**

In this study, the “positioning resources” of marine islands is an integrated resource, which is a combination of all values derived from the three components: (i) Advantages of geographic location and morphology, spatial structure; (ii) The distinctive features of natural and social resources on and around marine island; (iii) Institution and decisions of the country in the context of region and world development. These three components do not exist independently but combine in a certain way. In particular, advantages of geographic

location and morphology, spatial structure play the important role as the premise to decide the “position” of the island. Institution and decisions play a key role, deciding the “position” of the island. Other resources contribute to enhancing the island’s position. Depending on the combination of these three components, the island’s position may be high or low. In other words, the island’s position is a function depending on three variables:

If *P*: Island’s positioning resources; *C*: Benefits from geographic location; *R*: Added value from natural resources and social resources; *I*: Benefit from institutions and decisions of the local and nation.

Then:

$$P = f(C, R, I) \quad (1)$$

The combination of the three components will create a “picture” of the island’s “positioning resources” in the human mind. Detailed description of components of island’s position includes:

**Geographic location and morphology, space structure of marine island**

**Island’s geographic location.** Includes the relative position (expressed in the accessibility and connection between the island’s absolute geographic location and the centers, regional economic centers, coastal and marine economic corridors...) and the absolute position (expressed in terms of geographical coordinates). This is a unique resource. This resource cannot be replaced or removed.

**The morphology and spatial structure of the island.** Are factors that represent the spatial morphology of an island such as size, shape, distance, distribution, arrangement, geological and topological features. These factors contribute to the increase or decrease of prominent features of the geographic location of an island.

**The resource on and around the island**

**Natural resources.** Are resources forming and existing in nature that humans can use, exploit and process. These resources are divided into 3 groups: (i) Flow resources (solar, wind, ocean waves, tides...); (ii) Renewable resources (land, fresh water, organisms, air...) and (iii) Non-renewable resources (petroleum, fossil fuels, coal...) (fig. 1).

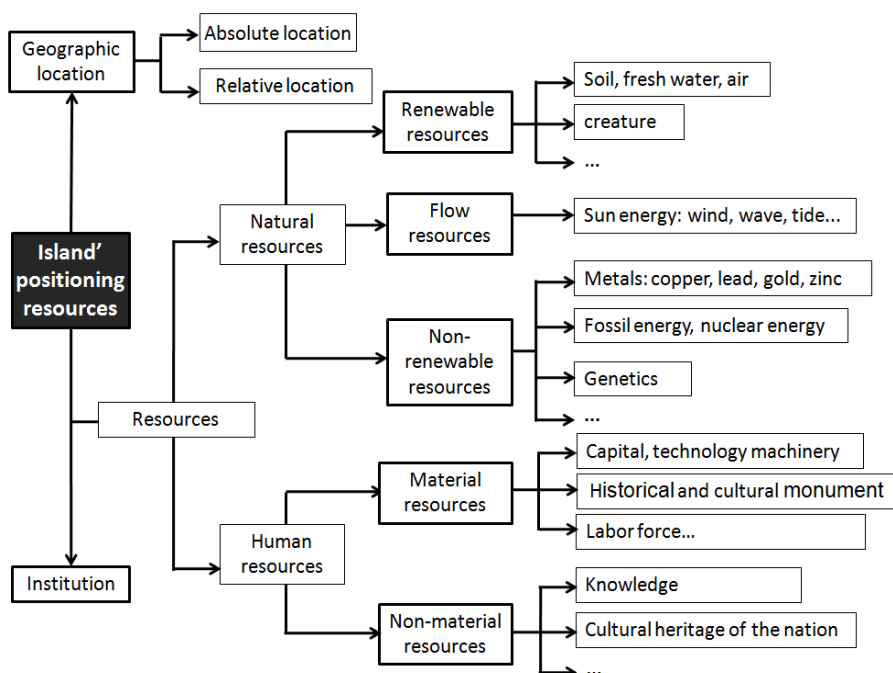


Fig. 1. Components of the positioning resources of marine islands

**Social resources (also called human resources).** Are all material, non-material and intellectual forms, created by physical and mental labor, organizational capacity and social order, customs and beliefs of human communities. They are used to create material possessions, or to create new values for human [16]. These resources include: (i) Material resources that serve for various purposes such as capital, technology, labor force, material cultural resources; and (ii) Non-material resources in the form of knowledge, social capital, non-material cultural resources (heritage of national culture).

**Institutional system and decisions of the nation.** Any countries always want to bring prosperity to the regions or areas where they govern. Lessons learned from successful or failed nations have shown the role of institutions, policies that determine the prosperity or demise of the nation. Indeed, an appropriate institution will speed up the pace of development and increase the quality of development. In contrast, an unreasonable institution will slow down the pace of development and degrade quality of development.

Institution and decisions are the laws, policies and decisions that humans create to guide the interactions among humans and between humans and the natural world. This is

a legally binding component, belonging to the power, the power of the nation [17]. It deeply reflects the nature and function of the nation. Institution can be amended to cope with changes in the political regimes. Thus, it plays a crucial role in the operation and development of policies and human behaviors.

The quality of the institution determines the position of the island, which reflects the political level, the political nature of the country. Today, a successful nation must create an inclusive institution that encourages investment, controls the power of the market, and engages in a variety of social choices. On the contrary, a failed nation can be extractive institution in which a small group of individuals do their best to exploit the rest of the population [18].

For a visual view of what is an island positioning resources, this article uses an image (fig. 2) illustrating the three components of marine island's positioning resources. In particular, the geographic location of the island (component 2) is the component that acts as a "leverage" in nature. Institution and decisions of the nation (component 3) are considered as "subject" to own and govern "fulcrum" and "leverage". This subject plays a vital role in using "fulcrum" and choosing "leverage" to raise the "position" of the island to a new level.

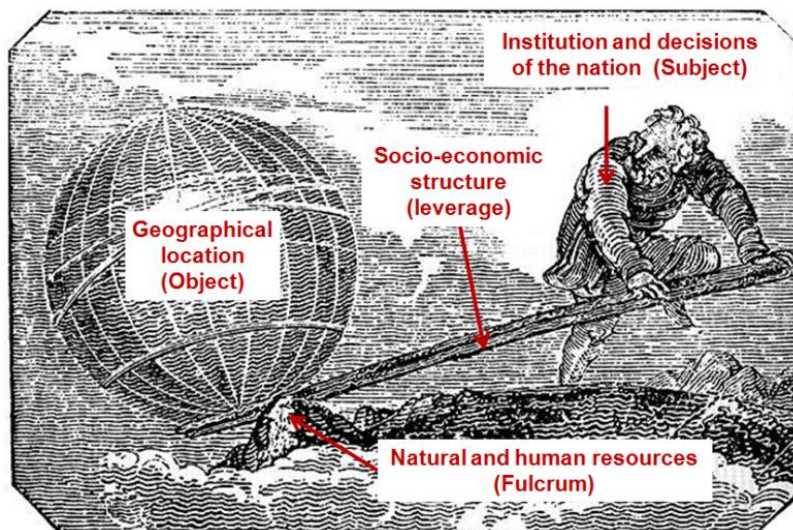


Fig. 2. Components in marine island's positioning resources

We assume that the “position” of marine island is determined by its superior value that comes from the favorable geographical and spatial features of that island. However, this value is promoted or not, depending on the vision, the wise decision, the intelligence of the institution and decisions of the local and the country. The quality of institution and decisions is reflected through the intelligent combination of “subject” and “leverage” on the basis of available “fulcrum” to create new value. This new value contributes to increasing or decreasing the island’s position.

## **IDENTIFICATION OF ISLAND’S POSITIONING RESOURCES**

**Characteristics of the island’s positioning resources.** Each island has its own features of space (location, distance, area, shape, distribution, arrangement, geological features, terrain, geomorphology...), spatial properties (natural resources, population, socio-economic structure, culture...), and the institutional system and policies of the nation that affect the development of the island. These characteristics can fluctuate over time. This fluctuation depends on many factors such as:

The relative position of island to the economic, political centers and marine economic corridors along the coast.

Added value from natural resources.

Local development resources such as capital, labor force (quantity, quality), science and technology, knowledge...

National and local development institutions and policies.

The autonomy of the island in the national administrative unit system.

Leadership capacity, management of local government in the island.

The “attraction” of the island in the regional and international networks.

Thus, the development of the island becomes prosperous or decayed depending on the interaction between these factors [19]. Particularly in the present context, humans play the leading role, controlling and deciding this process through support systems such as institutions, policies, laws...

Position and geographical resources are two completely different categories. In terms of its content, the position is integrated resource that includes geographic resources, whereas geographic location is purely geographical natural resources. Thus, geographical resources are invariant, formally expressed in the form of geographic coordinates (latitude, longitude), while the position resources is variable, it can change through time. As a result, the content of the positioning resources are intrinsic value, it requires “vision” and the wise decision to identify it. In this way, the value of the marine island’s position can be compared, while the geographical location of the islands cannot be quantified.

The “position” of marine island does not include all values of natural and social resources. It only includes added value or service values when exploiting and using these types of resources.

**Identification of marine island positioning resources values.** The values of the island’s position are the benefits that human can exploit. These benefits are limited and vary in geographical space. They depend on the level of awareness, use, exploitation and management of people and, most importantly, the visibility, decision-making, intelligence of institution and local and national decision-making.

The position of marine island is expressed in different forms. These forms need to be measured with very specific criteria. Based on the territorial function of the island, we consider that the value of marine island’s position can be identified by three criteria: (i) motivation for economic development, (ii) ecological balance and (iii) national defense and sovereignty.

**Economic development motive.** The needs of society are inherently the driving force of development. It is gathered from the needs of individuals unified by socio-economic relationships. Humans have different roles, so the need for resources is different. With the specific characteristics of marine island, the ability to provide resources for these needs is always limited. Therefore, the island can only

develop a number of key industries, as the basis for other sectors to develop. For most, the limitation of ecological capacity of the islands is very large, it depends on the conditions of each island for choosing the appropriate development strategy. This strategy is not necessary to satisfy all factors. In other words, the economic dynamics of the island can be measured by activities that promote the inherent wealth of the island.

**Ecological balance.** A necessary condition to maintain the natural stability of ecosystems, towards the highest adaptation to living conditions. The state of the system is dynamic and when there is an impact from the external environment on a certain element in the system, the system will change. Over time, the system will establish a new equilibrium state. However, the island is limited in space, ecosystems are vulnerable to natural disasters and over-exploitation. Thus, the ability to set up a new equilibrium on the island is limited. If one component in the system is over-reacted, there is no possibility of self-recovery, the consequences are the degradation of other components in the system, causing the whole system imbalance, degradation. Humans are an integral part of the ecosystem, so they also suffer from severe impacts from this process.

**Defense, security and sovereignty.** It is an important criterion that contributes to the stability of human settlements and the establishment of high surplus value as well as asserting national sovereignty and sovereignty for that territory. The island has high or low security or national sovereignty, depending not only on its relative geographic location to the sensitive regions in the region, country, region and the world but also on the complex situation of socio-economic activities taking place on the island.

In general, these three criteria complement and support each other to make up the island's positioning resources. They act as organs in a living organism, the weakness of one of these criteria will diminish the value of other criteria and vice versa, the superiority of any criterion will promote other criteria to develop.

## PROPOSING METHODOLOGY FOR QUANTIFYING THE VALUE OF MARINE ISLAND'S POSITION

**Analytical approach to marine island's positioning resources.** As stated above, the character of the positioning resources is always dynamic, changes over time and is greatly influenced by the external environment, as well as the purpose of use. Because of this characteristic, the position assessment approach also requires multidisciplinary and multi-scale to look at the problem in both an internal environment (control) and an external environment (beyond control) of the island.

**Multi-scale approach.** The use of a multi-scale analysis approach will allow researchers to look at multiple perspectives and multiple actors. At each level (local, nation, region and international), the factors affecting the position of the island will be considered and assessed.

**System approach.** Each island is considered to have a special value on the positioning resources. It is value system derived from natural and human resources. Therefore, when analyzing island's position resources, it is necessary to comprehensively evaluate the elements in the value system that make up the level of positioning resources.

**Regional approach.** This approach allows for recognition of events, the historical progress of the island in a synergy. The study of the island's position needs to be evaluated not only by the particular internal factors, but also as a result of interactions between internal and external factors in the development trend of the island. This approach takes a closer look at the dominance, impacts factors or characteristics of the island's development in the coming period.

**A multidisciplinary approach.** This approach ensures the optimal use of island's positioning resources effectively. This approach allows combating conflicts of interest, respecting community structures, using traditions, preserving and promoting the values of nature and humanity. Due to the nature of the object and the optimal use, the fields of natural and social sciences need to be analyzed.

**Proposing the methodology for evaluating the value of island’s positioning resources.**

According to Pearce [20], the total economic value of natural resources is the sum of the

resources in the common monetary units that the society loses if the resource is lost, including use value and non-use value. Resource value is based on values:

$$\begin{aligned}
 \text{Total economic value} &= \text{use value} + \text{non-use value} \\
 (TEV) & \quad (UV) \quad (NUV) \\
 &= \text{direct use value} + \text{indirect use value} + \text{option value} + \text{existence value} \\
 & \quad (DUV) \quad (IUV) \quad (OV) \quad (EV)
 \end{aligned}$$

The island’s positioning resources also includes direct use value, indirect use value, reserve value, and non-use value [21, 22]. When quantifying the value of marine resource in general and the value of marine positioning resources in particular, most of the projects only concern the direct use value, not considering the indirect use value and preserve value, but these values are sometimes greater than the direct use value [13].

In order to increase the value of marine island’s positioning resources, it is required to evaluate the use and non-use values of natural resources in a certain territory. If the direct use value of the resource is easily measured, the remaining values are difficult to quantify. However, Pearce’s assessment methodology has provided a useful tool for quantifying the value of resources that serve the rational use.

From the equation (1) presented above, we set the expression that describes all the components of island’s positioning resources as follows:

If *P*: Island’s positioning resources; *C*: Benefits from geographic location; *R*: Added value from natural resources and social resources; *I*: Benefit from local and national institutions and decisions of the nation; *V*: New value created by the intelligent combination between *R* and *I*.

Then:

$$P = a.C \times V(b.R, c.I) \quad (2)$$

Where: *C, R, I* ≠ 0; *a, b, c*: Weights to establish the importance of the constituent elements of the island’s positioning resources.

The function of the expression (2) can be explained as follows: Due to the favorable

geographic location (*C*), the average apparent value of the resource (*V*) that derived from the intelligent combination of institution (*I*) and resources (*R*) has been increased *C* times compared to the value of the same resource elsewhere in a country with less favorable geographic features.

In practice, the incremental benefits of all resources (*R*), institution (*I*), and incremental coefficient *C* can be determined through survey data or regional economic statistics by traditional methods.

In fact, the two components of resources (*R*) and institution and decisions (*I*) are always present and interact with each other in a certain territorial space. In which, natural resources play a role as a hardware, which is highly stable, hard to change and influenced by society, institution and decisions. Social resources are considered as a software, which expresses human labor in the form of knowledge, labor or technology to create material and spiritual resources for human demand. This resource is unstable, easy to change, depending on each stage of development and subject to compulsory management of the institution and decisions (*I*).

In contrast to these two types of above resources, institution and decision (*I*) is an intelligent component. It does not directly generate benefits for human being, but it has full power to combine two above parts (hardware and software) in order to create the benefit for socio-economic development of human.

However, in reality, no combination is absolutely perfect, the areas 1, 2, 3 in the fig. 3 are what we do not expect, but it always happens. These are issues that need to be addressed and overcome. In particular, the area



1 shows the impact of human factors on the natural world beyond the control of local and national management. In other words, the policy of the state does not cover all practical issues. Consequently, the results often leave unpredictable consequences on the environment, accelerating the process of

disrupting the balance of natural ecosystems. The area 2 represents a shortage of resources (human, financial resources,...), science and technology and social capital that affect nature to create material wealth for society. The area 3 denotes shortages of resources for balanced and sustainable development.

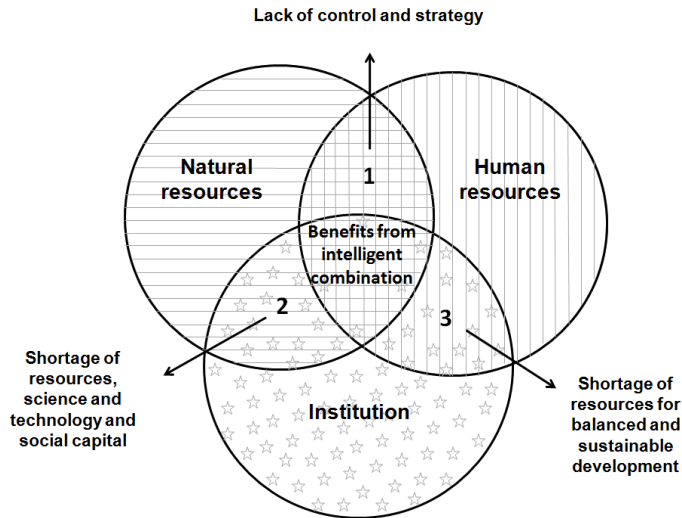


Fig. 3. Smart combination between the two components resources (R) and institution and decision (I)

In order to minimize problems happening in areas 1, 2, 3, the role of the institutional and decisional component is extremely important in adjusting the mechanism, appropriate policies,

thereby mobilizing all resources (human, financial, internal, external, domestic and foreign) to participate in socio-economic development, affirming the position of the island.

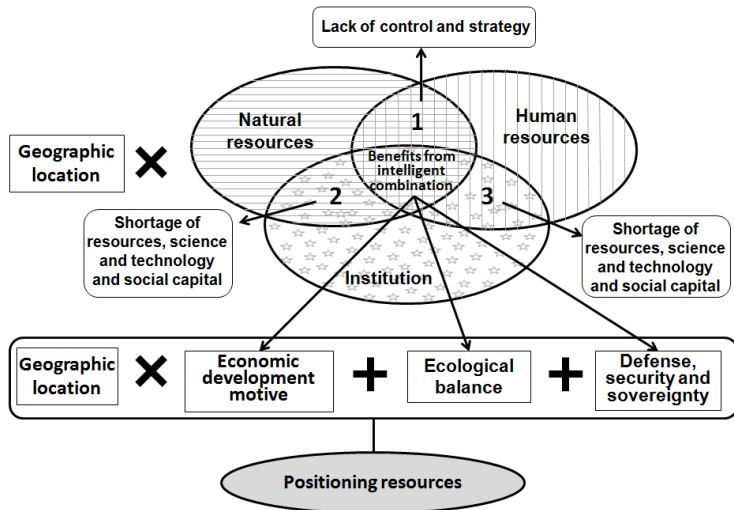


Fig. 4. Analytical framework for quantitative measurement of the value of island's positioning resources

After establishing the equation (2) in combination with the three criteria for quantifying the value of island's positioning resources, we can define the expression for the work of quantifying the value of island's positioning resource as follows:

$$P = a.C \times (x.V1 + y.V2 + z.V3) \quad (3)$$

Where: *P*: Positioning resources of the island; *C*: Benefits from geographic location; *V1*: Benefit from the value of motivation of economic development; *V2*: Benefits from the value of national security and sovereignty; *V3*: Benefits from the value of ecological balance; *a*, *x*, *y*, *z*: Weights measure the importance of each component that constitutes the value of the components within marine island's positioning resources.

## CONCLUSION

The sustainable socio-economic development of the islands today is not based solely on the resources available on islands, but also on the vast seas and oceans surrounding the islands. Remarkably, the advantage of marine islands' positioning resources bring. In particular, the geographic location and spatial patterns of the islands are important. It plays the role as the basis for determining the position of the island. Institution and decisions of the leaders play a key role, deciding the value of the island's position. Other resources contribute to increasing or decreasing the island's position.

Many researchers have recognized the position as a kind of resource, even though the scientific basis is being established. Indeed, the identification and manipulation of the island's position has yielded enormous benefits for the economic development of the country, especially the development of service economy. Therefore, the establishment of a scientific basis and methodology to quantify the value of island's positioning resources is necessary, contributing to the development of a new approach to the exploitation and rational use of resources, spatial planning and sustainable development of marine island socio-economy.

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