



Strengthening basic investigation of marine and island resources and environment

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INTRODUCTION

Vietnam has a coastline of more than 3,260 km with a large sea area, rich in potential natural resources such as oil and gas, minerals, marine resources, seafood resources and marine tourism. Marine and island resources serve not only as a significant economic resources but also as a strategic foundation for the country's sustainable development. Basic investigation of marine and island resources and environment plays a pivotal role in assessing the current status and potential of these resources, while providing accurate scientific data to propose solutions for sustainable management, protection and exploitation. Additionally, it helps identify adverse impacts of socio-economic activities on the marine and island environment, thereby enabling the implementation of appropriate mitigation and prevention measures.

BASIC INVESTIGATION OF MARINE AND ISLAND RESOURCES AND ENVIRONMENT

A basic investigation of marine and island resources and environment refers to the systematic collection, analysis, and evaluation of data concerning marine and island resources and environment factors. Its purpose is to gain a comprehensive understanding of the current conditions, resource potential, and anthropogenic impacts on marine ecosystems, forming the basis for effective management and conservation policies. Fully awareness of the strategic position of the sea and islands for the economy, national defense and security, the Communist Party of Vietnam and the Socialist Republic of Vietnam have consistently introduced relevant policies and directives over the periods on basic investigation and management of marine and island resources and environment. On March 1st, 2006, the Prime Minister issued Decision N^o. 47/2006/QĐ-TTg on the approval of "the Master Project on the basic survey and management of marine natural resources and environment toward 2010, vision 2020". On February 9th, 2007, the 10th the Central Committee of Communist Party of Vietnam issued Resolution N^o. 09-NQ/TW on Vietnam's Marine Strategy to 2020, affirming that the potential of marine and coastal resources in national socio-economic development, environmental protection, and strengthening national security and defense. Between 2010 and 2013, the Government issued three

additional decisions to expand projects under the Master Project. In particular, on June 25th, 2015, the National Assembly has just passed the Law on Natural Resources and Environment of Sea and Islands (Law No. 82/2015/QH13) and officially takes effect on July 1st, 2016. This marked a significant advancement in integrated and unified marine governance. Currently, the basic investigation of marine and island resources and environment is regulated by the Law on Natural Resources and Environment of Sea and Islands, along with decrees and circulars providing detailed guidance on the procedures and responsibilities in the investigation and management of marine and island resources and environment. Understanding the concepts and legal basis is an important foundation for effective investigation and contributing to the sustainable development of the country's marine and island resources.

Basic investigation of marine and island resources and environment is conducted through three keys stages: Data collection; data analysis and interpretation; and reporting with management and exploitation recommendations.

For data collection is the initial but extremely important stage, laying the foundation for the next stages. Remote sensing technology, Geographic Information System (GIS) and modern field survey methods are used to collect accurate data on topography, marine and island resources and environment. These data include not only information on natural conditions but also on exploitation activities, resource use and current environmental status.

Data analysis and interpretation is the process of transforming raw data into valuable information. Using specialized software, scientists and experts build models to assess environmental impacts and forecast changes in marine resources and environment. These analysis results help to better determine the distribution of resources, pollution status and factors affecting marine and island ecosystems.

Finally, reporting and proposing measures for resource management and exploitation is the concluding stage, based on the results of collection and analysis. The report will provide specific comments on the current status of marine resources and environment, and propose measures for sustainable



Seawater sampling using CTD-Rossetter device

management and exploitation. These measures include adjusting policies and laws related to resources and environment, to technical solutions to minimize negative impacts and optimize the use of marine and island resources.

Thus, the process of basic investigation of marine and island resources and environment is a series of closely linked stages, ensuring accuracy and science in data collection and analysis, as well as in providing reasonable measures for marine and island resource management and exploitation.

CURRENT STATUS

OF MARINE INVESTIGATION EFFORTS

Recently, Vietnam has achieved substantial progress in marine resource and environment investigation, especially under “the Master Project on the basic survey and management of marine natural resources and environment toward 2010, vision 2020” (Decision No.47/2006/QĐ-TTg of the Prime Minister) and the Key Program for Baseline Survey of Marine and Island Resources and Environment to 2030 (Decision No. 28/QĐ-TTg, of the Prime Minister, dated January 7th, 2020). Up to now, notable milestones include the creation of 1: 200,000 scale nautical charts covering 819,500 km² (~82% of Vietnam's sea area), and marine geological-mineral surveys at a 1: 500,000 scale over 375,668 km² (~38% of Vietnam's sea area). And nevertheless, challenges persist-particularly in completing nautical charts, producing high-resolution bathymetric maps and completing seabed topography in strategically vital areas such as the Spratly and Paracel archipelagos and nearshore zones. Detailed depth data systems also require further development.

Marine geological-mineral surveys are carried out in many areas with different depths and conditions. However, in deep and offshore areas - where there is great mineral potential, the survey work still faces many difficulties due to the lack of modern equipment and complex survey conditions. In addition, the lack of specialized marine research vessels for deep and offshore areas leads to the need to hire and conversion ships to carry out projects. This process is not only costly but also slows down work progress, affecting the results of the survey. The above challenges show the need for further investment in facilities and equipment, as well as capacity building and closer

coordination among relevant agencies to overcome difficulties in basic surveys of marine resources and environment.

Another major challenge in marine investigation is the shortage of highly qualified and experienced personnel in the field of marine science. In addition, the remuneration mechanism for those working at sea, especially working on off-shore areas, is still inadequate, making many people reluctant to participate in this field. Therefore, there is a need for specific policies to desirable employee benefit sand talent holding in the field of investigation on marine resource and environment.

THE APPLICATIONS OF SURVEY RESULT IN MARINE ECONOMIC MANAGEMENT AND DEVELOPMENT

Basic survey results provide foundational input for drafting marine-related legal documents such as the Law on Natural Resources and Environment of Sea and Islands and associated regulations. They are particularly critical for the National Marine Spatial Planning (MSP), adopted by the National Assembly during its 15th, 7th session. This MSP guides rational, efficient, and sustainable resource use, biodiversity conservation, and protection of natural-cultural-historical values in Vietnam's seas and islands. The data also enhance the regulatory capacity of state agencies in monitoring and controlling marine resource utilization, ensuring legal compliance and adherence to international commitments on marine environmental protection.

Furthermore, the results of basic surveys on marine resources and environment have significantly contributed to elucidating the potential, comparative advantages, and functional characteristics of various marine spatial zones. These scientific results form a critical foundation for delineating marine spatial planning (MSP) and zoning schemes to support the sustainable development of key maritime economic sectors. These include the fisheries economy in conjunction with marine biodiversity conservation, as



well as the assurance of national defense and security, diplomatic relations, and international cooperation; maritime economy, maritime transport sector, seaport infrastructure development, shipbuilding and ship repair industries; and marine tourism and services sector. In parallel, such information enables investors to conduct informed decision-making processes based on reliable geospatial and environmental datasets, thereby mitigating investment risks and enhancing project efficiency.

Currently, research, surveys, and exploration of new marine energy sources such as methane hydrates, tides, ocean currents, waves, offshore wind power, and marine solar radiation are being accelerated, serving as a basis for developing new resources. These activities serve as a scientific and technological basis for the prospective exploitation and utilization of novel marine energy resources, in alignment with the strategic targets outlined in Resolution No. 36-NQ/TW on the Strategy for Sustainable Development of Vietnam's Sea-based Economy by 2030, vision to 2045.

In conclusion, basic investigations of marine and island resources and environment are extremely important in marine economic development and management. These results provide detailed data on marine resources, environment and marine ecosystems, it's a scientific basis for managers and policy makers to make strategic decisions for management and development of the marine economy in a sustainable and effective manner, contributing to environmental protection and socio-economic development.

ORIENTATION AND DEVELOPMENT STRATEGY FOR SURVEY WORK

Basic investigations of marine and island resources and environment constitutes a critically important task, provides scientific and practical foundations for the formulation of planning, development strategies, policies, and legal frameworks. These efforts aim to ensure the sustainable management, exploitation, and utilization of marine and island resources and environments, as well as to enhance adaptive capacity in response to climate change.

In recent years, the Communist Party of Vietnam and the Socialist Republic of Vietnam have promulgated numerous resolutions, directives, and regulatory documents, while also deploying various measures to improve the effectiveness of basic investigations in the marine and island domain. Notably, the Government issued Resolution No. 48/NQ-CP dated April 3rd, 2023, approving "Strategy for sustainable exploitation and use of resources, environmental protection of seas and islands until

2030, vision to 2050". To effectively implement the objectives outlined in the Resolution, future basic survey activities require strategic orientation and specific development roadmaps, including: finalization and refinement of the legal and regulatory systems for the management, exploitation, and utilization of marine and island resources and the environment; formulation and synchronized implementation of incentive and support policies for the marine research and survey sector; strengthening and streamlining the institutional structure of state management agencies responsible for basic surveys; Increasing financial, human, and technical resources allocated to basic investigation works; proposing and launching high-priority programs, schemes, and projects with urgent relevance; enhancing inter-ministerial, inter-sectoral, and central-local coordination mechanisms; improving inspection, supervision, and evaluation of project implementation processes; advancing the application of modern technologies and innovative survey methodologies; promoting international cooperation and data sharing in the field of marine and island research.

CONCLUSION

In summary, basic investigations of marine and island resources and environment play a critically important role in providing accurate data and information essential for the effective management and protection of Vietnam's marine and island environment. These surveys serve as a foundational input for strategic decision-making processes, supporting marine planning and the sustainable development of the marine economy, while contributing to environmental protection, ecosystems and climate change adaptation. Over the years, basic survey efforts have achieved significant progress, including the systematic collection of comprehensive datasets and the delineation of critical marine zones requiring enhanced protection and regulatory oversight. However, several challenges remain-particularly in terms of limited resources, technological constraints, and insufficient inter-agency coordination-which have hindered the achievement of certain desired outcomes. To improve the quality, accuracy, and operational effectiveness of basic investigations, it is essential to intensify investments in advanced survey technologies and data processing systems. At the same time, emphasis should be placed on capacity building and professional development for technical personnel engaged in marine surveys. Establishing a robust and integrated coordination mechanism among relevant governmental agencies and organizations is also imperative to ensure the consistency, efficiency, and strategic alignment of all survey activities ■