

New development of marine spatial planning in China: problems and policy suggestions on the implementation of National Plan for Main Functional Zones of Oceans

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Abstract

Purpose – The focus of this paper is to further improve the implementation safeguard measures of the National Plan for Main Functional Zones of Ocean (NPMFZO) based on the implementation status of the national marine main functional area plan after the promulgation of the existing marine planning implementation safeguard measures, aiming at the problems existing in the implementation of the plan, to help the implementation of the plan more effective.

Design/methodology/approach – This paper reviews the historical process of the preparation and implementation of NPMFZO, analyzes the problems existing in the implementation of this plan, and puts forward some measures and suggestions under the background of the new national territory planning system.

Findings – In the new period, the authors should focus on building the evaluation system of planning implementation, strengthening the coordination with other plans, improving the supporting policies of planning and ensuring the effective implementation of the main functional zoning of oceans under the territorial spatial planning system.

Originality/value – This paper reviews some problems existing in the implementation of the NPMFZO and puts forward policy suggestions to ensure the implementation of the plan in the new period.

Keywords Marine spatial planning, Implementation, Planning policies

Paper type General review



1. Introduction

Marine spatial planning (MSP) is a practical approach aimed at organizing interrelationships in the way of the use of marine space and other ways more effectively, balancing the relationship between various development requirements and marine ecosystem protection requirements, and planning ways to achieve social and economic goals (Department for Environment, Food & Rural Affairs of United Kingdom, 2008). As early as the 1960s and early 1970s, Australia developed a marine spatial plan because the public was concerned that oil drilling and limestone mining would conflict with the protection of the Great Barrier Reef (Lawrence *et al.*, 2002). In recent years, the European Union, the United Kingdom, Australia, Belgium, the Netherlands, Canada, the United States, and other regions or countries are using marine spatial planning as one of the important policy measures for ocean management (EU, 2002; European Commission Joint Research Centre, 2014; Federal Office for Scientific, 2000; The Dutch Ministry of Infrastructure and the Environment, 2015; Australian Government National Oceans Office, 2004; Fisheries and Oceans Canada, 2005; Province of British Columbia, 2015; National Ocean Council, 2015; Washington Coastal Marine Advisory Council, 2017). Over the past decades, significant progress has been made by governments in their thinking about MSP. MSP is globally widespread and a topic of increasing importance in the scientific and policy realms. It is currently under development in almost 70 countries, encompassing six continents and four ocean basins (Santos *et al.*, 2021).

Under the background of marine development strategies such as the construction of maritime power and the Maritime Silk Road, China's demand for marine space resources has increased rapidly and the intensity of marine development has gradually improved. The pressures on China's oceans have become more and more serious. Facing increasing marine challenges, China has developed planning for marine spaces aimed at coordinating sea area uses, meeting the increasing demand for space from existing and new sea uses, and protecting the marine environment (Teng *et al.*, 2021). Marine functional zoning is one of the well-known Chinese MSP initiatives. In fact, China has established a comprehensive MSP system including strategic planning, ecological protection planning, and spatial resources management planning (Figure 1).

The *National Plan for Main Functional Zones of Oceans* (NPMFZO) is the basis for formulating marine economic development strategies and marine spatial layouts at the macro level and is the most powerful policy tool for the efficient use of marine space resources (the State Council). On the other hand, after the introduction of NPMFZO, it also faces the dilemma of good-looking planning and bad-looking implementation.

In March 2018, China's government carried out the State Council institutional reform and set up a new Ministry of Natural Resources (MNR) (Hu *et al.*, 2020). All marine and terrestrial spatial planning will be integrated into unified management by MNR and its affiliates. MNR started the process of territorial spatial planning in 2019. In the future, NPMFZO will continue to play a coordinating and strategic role in the new planning system. Therefore, this paper reviews the implementation of NPMFZO (Chapter 2), analyzes the main problems of the planning implementation (Chapter 3), explains the changes in the marine main functional areas in China's new MSP system after 2019 (Chapter 4), and puts forward countermeasures and suggestions to improve the planning guarantee measures of the national marine main functional areas under the new planning system (Chapter 5).

2. Overview of the implementation of National Plan for Main Functional Zones of Oceans

2.1 Background, purpose and legal basis

With the expansion of China's sea scale and the increase in sea use intensity due to the rapid development of industrialization and urbanization, marine space security is facing many

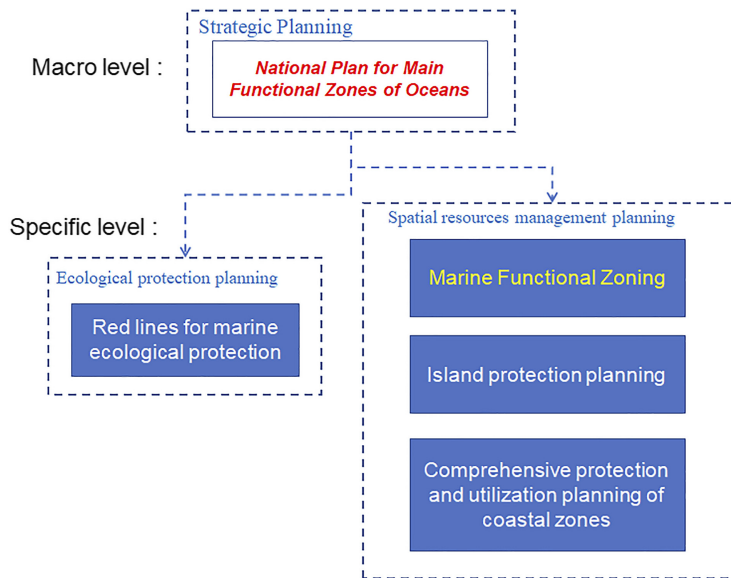


Figure 1.
Marine spatial
planning system
of China

problems and severe challenges, such as the low degree of intensive use of marine resources and the pollution of sea areas, prominent ocean environmental pollution, the irrational structure of the marine industry and insufficient supply of marine space resources. In response to the contradiction between the development and utilization of marine resources and marine environmental protection, the State Council has issued the NPMFZO, in order to improve marine resources development capabilities, develop marine economy, protect the marine ecological environment, maintain national marine rights, and interests, and further optimize the pattern of marine space development. It is the basis for promoting the formation of marine main functional zones and binding plan for the development of marine space (the State Council).

2.2 Goals and zoning

The proper meaning of the NPMFZO is to rationally determine the main functions of different sea areas, scientifically plan the development of the sea, adjust the development content, standardize the development order, improve the development capabilities and efficiency, strive to promote the transformation of marine development approaches to recycling, achieve sustainable development and utilization, and build a pattern of marine space development with coordinated land and sea and harmonious human and ocean according to the carrying capacity of the resource and environment in the different sea areas, the existing development intensity and development potential (the State Council).

NPMFZO defines three major goals: (1) The pattern of marine space utilization should be clear and reasonable. China adheres to development and surface protection, forms a pattern of ocean development and marine ecological security pattern, and the marine fishery product protection pattern based on traditional fisheries and aquaculture areas, and development pattern of offshore oil and gas resources with “near-storage and far-use” strategy; (2) improve the efficiency of ocean space utilization and (3) enhance the sustainability of marine development.

NPMFZO also determines that the marine space is divided into four types of areas, including the optimized development area, key development area, restricted development

area, and prohibited development area. The optimization of development areas refers to the existing areas with high development and utilization intensity, strong resource and environmental constraints, and the need for adjustment and optimization of the industrial structure. The key development areas have an important position in coastal economic and social development and have great development potential. With the strong resource and environmental carrying capacity, it is possible to carry out high-intensity and concentrated development of the sea area. And the restricted development area refers to the sea area that provides marine aquatic products as the main function, including sea areas for the protection of marine fishery resources and marine ecological functions. The prohibited development area refers to the sea area that plays an important role in maintaining marine biodiversity and protecting typical marine ecosystems, including marine nature reserves and islands where the territorial sea is based (the State Council).

In order to ensure the effectiveness of the plan, NPMFZO proposes planning safeguard measures from the aspects of policy guarantee, planning implementation, and performance evaluation.

The introduction and implementation of NPMFZO marked that the national main functional zone strategy has achieved full coverage of terrestrial and national land space and sea area and national land space, and has promoted the development of land and sea as a unified, highly efficient, coordinated, and sustainable development (Shen, 2015).

2.3 Relationships with other marine planning

Marine planning is a strategic and guiding plan for the overall planning and development of marine development, utilization, governance, and conservation activities within a certain period (Sun, 2005). At present, the marine plans at the national level in China include the *Outline of the National Marine Development Plan*, *National Marine Functional Zoning* (NMFZ), NPMFZO, *National Outline for Marine Economic Development Planning*, and *National Plan for Developing Marine Science and Technology* (the State Council, 2008; State Oceanic Administration, 2011-2020; National Development and Reform Commission, State Oceanic Administration; State Oceanic Administration, 2016-2020). It is a fact that China's marine planning has a clear hierarchy. At present, in addition to the science and technology plan for sea development, the *Outline of the National Marine Development Plan*, NMFZ, NPMFZO, *National Outline for Marine Economic Development Planning*, have been carried out by the state, province (autonomous regions, municipalities directly under the Central Government), cities and counties, especially the marine functional zoning. As a result, China has formed a relatively complete system of marine functional zoning.

According to the classification of marine planning, marine planning can be divided into four categories: master planning, special planning, regional planning, and spatial planning (Wang and Guo, 2009). There is a complementary relationship between different types of marine planning at the same level (Li *et al.*, 2012). NMFZ and NPMFZO belong to the MSP. They have different orientations and are all important means of MSP. NPMFZO focuses on the regional management of marine development intensity, while NMFZ focuses on the division of sea area functions.

The NPMFZO is an important means for the state to implement macro-control over the development of the ocean, and is an important basis for formulating strategies for the development of the ocean and the preparation of other marine plans. It is an important carrier to build the development pattern of the orderly oceanic regions in China and achieve the coordinated development of the marine economy, resources, and the environment. It marks a significant turning point in China's ocean development model changing from the original "advance together" to differentiated development (Luan *et al.*, 2001).

2.4 Status of the implementation of the plan

Since the publication of NPMFZO in August 2015, the ocean administrative authorities, together with the relevant departments and local governments, have strictly adhered to the planning contents, objectives, and control requirements outlined in NPMFZO to promote the formation of the layout of the main marine functional areas various measures work.

To ensure the implementation of NPMFZO, the government puts forward policies and measures for fiscal, taxation, investment, industry, maritime, environment and plans for the implementation for the planning of provincial-level marine functional areas, and the implementation of planned environmental impact assessment according to law.

In addition, China’s coastal local governments, in accordance with NPMFZO and in combination with the actual situation of coastal provinces and cities, prepared the provincial marine main functional area plan to support the implementation of the national marine main functional area plan (e.g. [Table 1](#)).

3. Main implementation problems

Since the publication of the NPMFZO in August 2015, the marine administrative authorities, together with the relevant departments and local governments, had strictly adhered to the planning contents, objectives, and control requirements outlined in the NPMFZO to promote the formation of the layout of the main functional zones of oceans. To ensure the implementation of NPMFZO, China has put forward policies and measures for fiscal, taxation, investment, industry, maritime, and environment, as well as the implementation for the planning of provincial-level marine functional areas according to law. In addition, according to the NPMFZO, local governments in the coastal regions of China used the provinces and municipalities directly under the jurisdiction of the coastal provinces and municipalities to compile provincial-level marine functional area plans to assist in the implementation of NPMFZO.

Judging from the current situation as a whole, the implementation of the NPMFZO is not effective, the planning objectives and planning guidance have not been fully implemented, and there are still considerable gaps compared with the marine functional zoning and other spatial plans. The implementation of NPMFZO mainly has the following problems.

3.1 Supporting policies lag behind planning

The properties and scope of NPMFZO determine its strategic, comprehensive and macroscopic characteristics. NPMFZO puts forward the development direction of marine space resources at the macro level, and provides a reliable legal guarantee for the sustainable development and utilization of marine resources and the construction of an ocean space development pattern coordinated by land with sea and human with the sea. However, the implementation of the plan lacked a clear executive subject, the relevant functional departments failed to give full play to the important role of the government in the development and layout of marine space resources, and their functions in supporting laws and regulations, detailed specifications and policy guarantee are not in place. To ensure

Table 1.
Marine main functional
areas of Shandong
province

Types of main functional zones	Proportion in waters under jurisdiction
Optimized development area	33.93%
Key development area	6.33%
Restricted development area	58.04%
Prohibited development area	1.7%

NPMFZO is implemented effectively, it is also necessary to formulate more detailed, highly operational, and easily enforceable regulations and policies for the main contents and targets of the plan.

3.2 Complicated administrative mechanism of planning implementation

The NPMFZO is very comprehensive and policy-oriented, and the management system is complex, involving many departments. At present, the implementation of NPMFZO has experienced a short time. It mainly focuses on the development and reform departments and the marine administrative departments. Tourism, transportation, maritime affairs, environmental protection and other relevant departments are not involved. However, in the implementation of NPMFZO, China has not yet established a mechanism for the implementation, supervision and management of the implementation of the plan. The planning of the marine functional area seldom plays a role of guidance and restraint in the actual work. The effectiveness of planning implementation is not strong enough.

3.3 Vague zoning standards and plan scope

The NPMFZO divides China's internal waters and territorial waters into optimized development areas, key development areas, restricted development areas, and forbidden development areas under the carrying capacity, current development intensity and development potential of different sea areas. There are no clear boundaries between the geographical locations of the four types of marine main functional areas in the national sea area, and there are cases where the marine main functional zone spans multiple administrative areas. The administrative boundaries of the four main functional areas divided by the "planning" are vague and the scope of the area is not clear, and it has not become an important basis for guiding the layout of the ocean space. Therefore, the four types of marine main functional areas in the plan lack operability for the implementation, monitoring and evaluation of the provincial marine main functional area plan.

3.4 Conflict with other ocean plans

Due to the differences between oceans and terrestrial regions, the late start of marine planning, the inadequacy of the planning system, and other reasons, there are many conflicts in spatial layouts and resources development direction between the NPMFZO and other spatial plans, especially the terrestrial space planning. The compilation of the NPMFZO also lacks connection research with other related plans, which indirectly leads to a serious contradiction between the plan and other plans in the implementation process. In addition, NPMFZO does not stipulate the development intensity of the limited development zone. If the development is carried out according to the functional areas allowed in the marine functional zoning, the strength of the industrial or urban sea or tourism seas may greatly exceed the limit of the allowable development intensity defined in the marine main function zone planning. Comparing the planning of the NPMFZO and the red line of ecological protection, it was found that when planning the limited areas of the sea, NPMFZO can be developed within the scope of the carrying capacity of marine resources and the environment with low intensity. However, in the definition of a limited development zone, in the ecological protection red line plan, such as the "multiple-in-one" ecological red line, the restricted development zone generally refers to an area where development activities cannot be carried out.

3.5 Lack of public participation

The implementation of NPMFZO requires not only the administrative functions performed by the government but also the participation of the market, citizens and social organizations.

At present, the participation of the public in the process of planning and implementation of NPMFZO in China's oceans, whether before the preparation of the planning, the preparation of the planning, or the consultation and supervision after the planning, the depth and intensity of public participation are far from enough. Moreover, China has no clear procedural regulations for the implementation of NPMFZO, and there is a lack of clear content and procedures for public participation. The lack of public participation has resulted in a very low level of social cognition in China's NPMFZO, which has also affected the effective implementation of planning in turn.

4. Policy adjustments in China's new spatial planning system

To solve these problems, the government had made several policy adjustments within the process of State Council Institutional adjustment. The MNR was established in 2018 to integrate the spatial planning functions of the former planning departments – the State Oceanic Administration (SOA) and the Ministry of Land and Resources (MLR). Through the implementation of multi-plans integration policy and land-ocean co-ordination strategy, all kinds of spatial planning in China have been integrated into National Territory Spatial Planning System. At the same time, planning conflicts caused by the separation of departments has been reduced, and the link between land and marine planning has been strengthened at the coastal area (Figure 2).

In the New Territory Spatial Planning System, *Main Functional Zones* still play a guiding role in marine spatial layouts. Considering stakeholders' demands, the resources and environment carrying capacity and utilization suitability are estimated, the territorial marine area is classified as ecological protection areas, ecological control areas and marine development areas under the latest national territory spatial planning System after 2018. For marine development areas, six subcategories are designed to maximize the effectiveness of utilization of marine resources (Figure 3).

5. Discussion and policy suggestions

Against the background of the preparation of the national territory spatial planning, we made some policy suggestions to ensure the implementation of marine main functional areas.

5.1 Building the plan implementation evaluation system

The evaluation indicator system for the implementation of the NPMFZO should be a set of indicators that comprehensively reflects the actual implementation of the plan. The number

National Territory Spatial Planning System(after 2018)

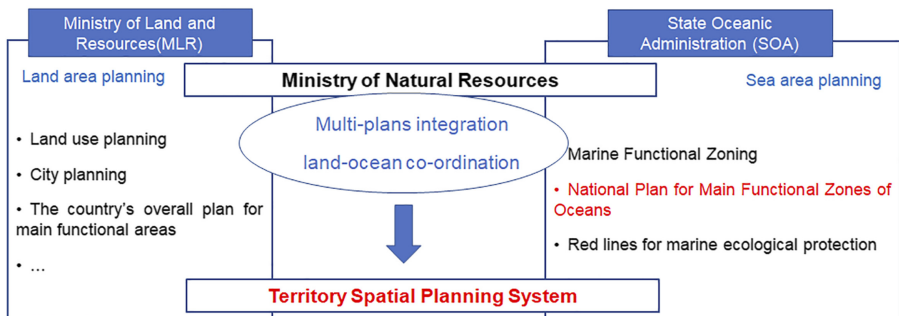


Figure 2.
Administrative adjustments in China's spatial planning system

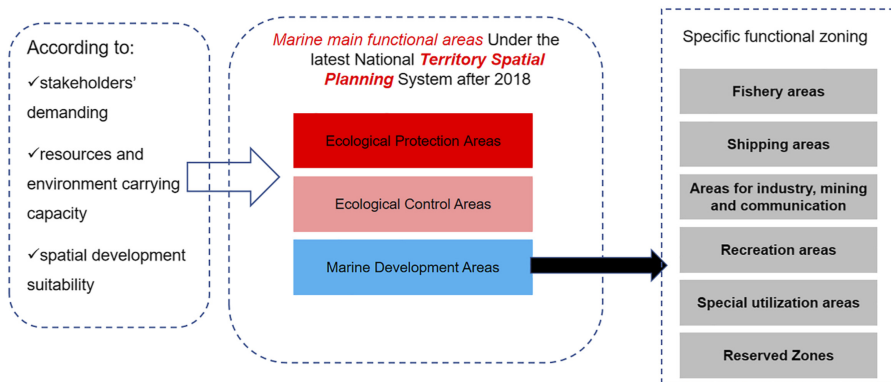


Figure 3.
Redefinition of marine
main function areas in
new planning system

of factors involved in the planning and implementation of the evaluation index system is relatively large, and the index factor is also divided into two aspects: quantitative assessment and qualitative assessment. The monitoring and evaluation of the planning and implementation of the NPMFZO essentially involve two levels of issues. First, evaluate the planning of NPMFZO through tracking and analyzing the degree achieved by building on the planning objectives, and functional areas; Second, monitor and evaluate the implementation of NPMFZO.

5.2 Strengthening coordination with other plans

- (1) Strengthen coordination with terrestrial planning. At present, under the conditions of China's management model and technical support, it is more difficult to formulate "multiple rules and regulations" at the national level, and the relative independence of the "multiple rules" system should be maintained. The NPMFZO, as the country's master plan, can guide the construction of China's territorial spatial planning system. The NPMFZO serves as the Blue Land Master Plan in China's spatial planning system and guides the formulation of the marine system plan and the formulation and implementation of relevant marine management policies. It requires that the planning objectives, planning tasks and policy constraints proposed by NPMFZO must not conflict with other related plans, and must be linked to other land-based plans at the national level.
- (2) Strengthen the interface with other marine planning. There will be a cross-overlapping relationship between NPMFZO and the planning of the provincial maritime main functional areas. For example, in the state-level marine optimization zone, there may be provincial-level marine key development zones, marine restricted development zones or even marine prohibited development zones. Therefore, the determination of this main function is only macroscopic, principled and staged. In the implementation of operations, the planning of the marine main functional area does not have the means to implement the actual space control. It can be seen that only by establishing cooperative relations with other professional marine spatial plans, such as marine functional zoning, can NPMFZO truly become a planning program with long-term and strategic roles, and can achieve its intended goal of wide-area governance.

- (1) Deepen the reform of the management system. It is necessary to form a leading group for planning and implementation of the NPMFZO and to coordinate the implementation of planning and important issues. Further clarify the work responsibilities and priorities of the NDRC, tourism, marine, transportation, maritime and other related functional departments, strengthen coordination and cooperation, establish a corresponding responsibility assessment system, mobilize the enthusiasm of participating departments and ensure the implementation of the plan. Further strengthen the National Development and Reform Commission to coordinate, coordinate, guide, and manage the functions of planning and implementation, and promote the effective and efficient implementation of the plan.
- (2) Improve the planning and implementation of the supporting policy system and subordinate planning. The relevant departments of the State Council in conjunction with the Maritime Bureau should speed up the improvement of the fiscal, taxation, investment, industry, maritime and environmental policy systems. At the same time, according to the NPMFZO and related marine management regulations, policies and plans, elaborate planning implementation details and specific measures to speed up the preparation of the provincial level marine major functional area planning, and help the implementation of the national marine functional area planning.
- (3) Increase the flexibility of planning implementation policies. The marine resources and environmental carrying capacity and development potential of various types of marine main functional areas are dynamically changing. Some sea areas with large carrying capacity may face the problem of declining bearing capacity after a certain period. In addition, the sea areas with small carrying capacity may have the bearing capacity enhanced under the support of the state. Therefore, various types of marine functional areas cannot remain the same, and the same policies for the main functional areas are not likely to remain the same. As a result, the government should consider this dynamic feature when formulating supporting policies. For example, in response to the risk of marine disasters, policies to improve the monitoring and early warning capabilities of major marine disasters and marine risk assessments are formulated.
- (4) Improve the planning and implementation management decision-making process. The government will establish a sound approach to the planning and implementation of NPMFZO, such as the rational establishment of planning and management agencies, and formulating specific policy procedures for different types of policies.

6. Conclusion

China attaches great importance to MSP and is trying to establish a territorial spatial planning system including marine functional zoning and main functional zone planning. Based on the current situation of the implementation of the plan, this paper summarizes the problems existing in the implementation process of the national marine main functional area plan, such as relatively lagging supporting policies and planning, imperfect implementation system and mechanism, insufficient connection with other plans and lack of public participation.

The NPMFZO should be an important part of national-territorial spatial planning. This paper analyzes the coordination between the planning and other plans in territorial spatial planning. It is believed that the coordination between NPMFZO and other relevant plans

should be solved first for the smooth implementation of the plan. Then, the government supporting policies and planning for the implementation of the plan and the construction of the evaluation system for the implementation of the plan are put forward as suggestions. Therefore, this paper puts forward some suggestions to improve the government's supporting policies and plan, and to construct the evaluation system for planning implementation.

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