

Understanding high-quality development of marine economy in China: a literature review

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Abstract

Purpose – High-quality development of marine economy is a new concept put forward in response to the current national strategy in China. The purpose of this paper is to thoroughly understand the connotation and significance of high-quality development of marine economy through literature review, and further analyze the prospects for further research.

Design/methodology/approach – The authors first use the information visualization technology of CiteSpace to present a systematic review of the published literature from 2010 to 2019. Then, the authors analyze the researches on high-quality development of marine economy in terms of connotation, evaluation dimension, development path and guarantee mechanism.

Findings – Analysis results show that there is still insufficient understanding of the differences and links between the high-quality development of marine economy and the construction of marine power, intelligent ocean and transparent ocean.

Originality/value – Based on a thorough understanding of the subject, this paper puts forward the direction of further research on evaluation index system, path design scheme and policy system construction for high-quality development of marine economy.

Keywords Knowledge mapping, CiteSpace, Marine economy, High-quality development

Paper type Literature review

1. Introduction

Marine economy occupies an extremely important position in China's economy. In 2018, the gross marine product reached RMB8.3 trillion, accounting for nearly 10 percent of GDP. The contribution rate of marine economy to the whole national economic growth was nearly 10 percent. The employment rate of marine economy reached 36.84m people and the employment rate of people involved in the sea was nearly 10 percent. Wang Hong, Director General of the State Oceanic Administration, explained that the marine economy was showing good development momentum with three 10 percent of the total. The rapid development of marine economy has become a new driving force for the development of national economy, but there are still many problems, e.g., capital-driven development model, low-end domestic demand, rough processing of consumer markets, small contribution rate and coefficient of technological progress, obvious differences in the long-term and short-term effects of economic policies, the lack of long-term impact mechanism of internal

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development motivation, etc. The exchange of develop mode has become the top priority of China's marine economic development and even national economic development.

High-quality development of marine economy is the goal of the transformation of the mode of marine economic development, and also the means to realize the transformation from a large marine resource country to a powerful marine economic country. China leaders have put forward guiding opinions on the high-quality development of marine economy. In May 2017, the National Development and Reform Commission and the State Oceanic Administration issued the 13th Five-Year Plan for National Marine Economic Development (Open Edition). Guided by the current problems and needs of China's marine economic development, they established a global outlook on the distribution of marine economy. In January 2018, the National Ocean Work Conference put forward clear requirements for accelerating high-quality development of marine economy. On March 2018, general secretary Xi Jinping took part in the deliberations of the Shandong delegation at the 13th session of the National People's Congress, pointing out:

[...] the ocean is the key to high quality development strategy. We should speed up the construction of world-class marine ports, perfect modern marine industry system, green and sustainable marine ecological environment, and make contributions to the construction of marine power.

A profound understanding of the connotation, dimensions and characteristics of high-quality development of marine economy is of great significance to the realization of the goal of building a powerful marine country.

In this study, we aim to analyze the researches on marine economy development based on online databases and with the use of scientific knowledge mapping software. This review includes the systematic analysis of keywords about marine economy in the literature. The aim of this review is to improve the understanding of high-quality development of marine economy, point out the insufficiency in current research and put forward further research directions on this topic.

2. Data collection and analysis method

The ISI Web of Science (WOS) database and Chinese National Knowledge Infrastructure (CNKI) database provide a guarantee for the reliability of raw data in visual analysis. Moreover, the search query provided by the institute accurate data acquisition. Here, the search criteria are "Subject: (marine or coastal or ocean) and (economy or industry)" for WOS and "Subject: (marine economy or marine industry) and high-quality development)" for CNKI. To cover current researches of this subject, the retrieval time span is set from 2010 to 2019. After screening, piece of data is downloaded as a full-record text format. The valid publications in total are 1,613 for WOS and 2,295 for CNKI, respectively.

In this study, CiteSpace is selected as the visualization analysis software. Knowledge map generated by CiteSpace is one of the most recognized technologies in the International Knowledge Metrology area (Chen, 2006; Chen *et al.*, 2010). CiteSpace has widely been used in many fields such as information science, computer science and so on. It can realize the graphic expression of knowledge frameworks, structures, interactions, cross-overs, derivations and other internal links. However, CiteSpace can only outline the clue of the whole research field and not extract in-depth literature details. Therefore, we performed critical reading of the relevant literature to clarify the focus topics and frontiers of our subject.

3. Literature analysis based on CiteSpace

3.1 WOS literature analysis

Keywords are the core point of a paper and a high generalization of the topic. Therefore, keyword analysis in a certain field of the literature is helpful to find the research hotspots in this field. First, we import literature data from WOS into CiteSpace software. Then, set the time

span is 2010–2019, and the length of a single time partition is 1, the source of clustering words is title, abstract, author keywords and keywords, clustering word base is burst terms, node type is keyword, which extracts 50 keywords with the highest cited frequency in each time zone. Finally, run the software and keyword maps based on WOS data sets are generated as shown in Figure 1. In Figure 1, there are 450 nodes, 1,534 connections and the network density is 0.0152. The keywords with higher frequency are shown as larger nodes in the figure.

As can be seen from Figure 1, the biggest key node is “Management,” which mainly develops in four directions: Fishery, Marine Protected Area, Biodiversity and Sustainable Development. Other import key nodes include “Conservation,” “Climate Change,” “Impact,” “Sustainability,” “Environment,” “Ecosystem Service” and so on. Obviously, current researches on marine economic development focus on the management of the conservation of marine ecological environment. Marine industry pays more attention to the sustainable development. From the perspective of research methods, there is a strong trend of interdisciplinary.

Further analysis of the relevant literature shows that international scholars mainly interpret the connotation of high-quality economic development from the comparison of quantity and quality of economic growth, the relationship between economic growth and social welfare, and sustainable economic development. Energy efficiency and environmental pollution in marine economic development are also discussed. Relevant studies mainly focus on the establishment of green modernization, green growth performance and environmental performance growth index. For example, Zapelloni *et al.* (2019) discussed the sustainable production solutions of marine equipment under the circular economy, and emphasized the importance of sustainable development. Pioch *et al.* (2011) put forward the measurement criteria based on ecological, social and economic interests. Xia *et al.* (2014) made an analysis on the development of marine renewable energy industry, and found that the development of this industry is conducive to optimizing the development structure and improving the marine economy. Liu and Cao (2018) focused on the impact of marine tourism on the marine economy and studied the correlation between them. Natarajan and Gujja (2011) pointed out that developing countries could bypass high-pollution and low-efficiency production technologies and achieve low-carbon development through energy switching.

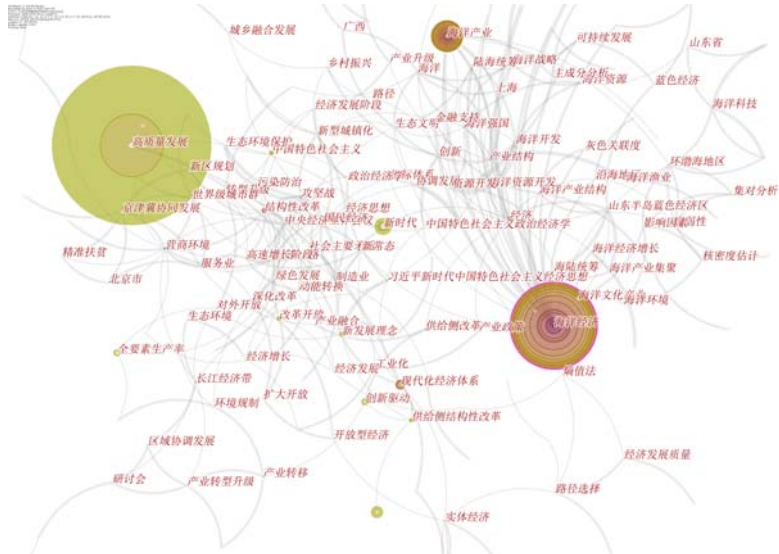


Figure 1.
The keywords of
marine economy
literature from
WOS (2010–2019)

Melendez-Ortiz (2011) found that effective international trade management can greatly promote the development of global green economy. DeSombre (2011) demonstrated the important role of international environmental organizations in the development of green economy. In terms of theoretical basic research, Kildow and McIlgorm (2010) pointed out that the current marine economy and marine environment are facing many problems, and tried to find effective methods to study the discordant development between them.

3.2 CNKI literature analysis

Import literature data from CNKI and set parameters as described in Section 3.1. We can get 334 nodes and 926 connections by CiteSpace as shown in Figure 2. The network density is 0.0167.

From Figure 2, the biggest key nodes are “High-quality development,” “Marine economy” and “Marine industry.” Main directions for high-quality development include “Modern economy system,” “New development concept,” “Innovation drive,” “Structural reform of supply-side” and so on. It implies that current researches focus on the understanding of high quality and how to realize high quality. Main directions for marine industry and marine economy include “Economy,” “Marine resource,” “Blue economic zone,” “Co-ordination of land and sea,” etc. Current researches on such subjects focus on the interaction between marine industry development and related areas, such as marine culture, marine resource, innovation and so on. The main method is case study of marine economic zone. However, from the relationship between high quality and marine economy, scholars seldom consider the particularity of marine economy in their researches on high-quality development.

Further analysis of the relevant literature shows that domestic scholars mainly interpret the connotation of high-quality economic development of marine economy from the background of times, such as five development concepts, supply-side structural reform and the transformation of new and old kinetic energy and so on. High-quality development is understood as a profound change in China’s economic development model. For example, Chao and Xue (2018) and Jin (2018) understand the concept of high-quality economic development from the perspective of the new normal economy. Ren (2018) and Chen and Chen (2018) understand the concept of high-quality economic development from the perspective of social contradiction transformation and five development concepts. Zhang and Zhao (2019) and

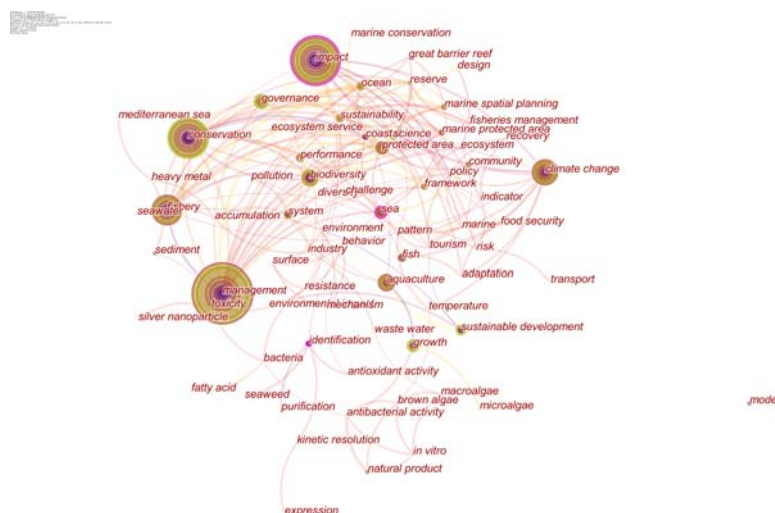


Figure 2.
The keywords of
marine economy
literature from
CNKI (2010–2019)

Zhang and Hao (2018) understand the concept of high-quality economic development from the perspective of supply and demand. In addition, the analysis of the characteristics of marine economy has also attracted the attention and research of some scholars. Wu (2010) pointed out that modern marine economy has some core characteristics different from land economy, including resource dependent, technology intensive, capital intensive, high risk and state led. Wang (2015) deeply analyzed the new characteristics and trends of China's marine economic development under the new normal economic development. Li (2018) analyzed the regional characteristics of China's marine economy, including instant space, high return and high risk. The above scholars have different opinions on marine economy and high-quality development, with different emphases. But they all describe the characteristics of marine economy and the basic connotation of high-quality development, which provides a useful reference for further understanding the high-quality development of China's marine economy.

4. Conclusions and prospects

This paper analyzes related researches on high-quality development of marine economy based on the knowledge map of CiteSpace. Analysis results show that scholars mainly study current situation and countermeasures from a macro-perspective. Research topics focus on related industries and activities of marine economy, mainly involving the contents of management, economics and ecology. A multi-disciplinary research framework system in this area has not yet been established, and needs more in-depth study.

4.1 Concept and characteristics

Since the concept of high-quality development of marine economy was put forward, scholars have done a lot of research on it, and preliminarily discussed the connotation and inherent requirements. Current studies have interpreted the high-quality development of marine economy from multiple dimensions, mainly involving the utilization of marine resources, ecological optimization, green development and other aspects. Overall, they have a profound interpretation of national policies, but the scientific connotation and attributes of the high-quality development of marine economy remain at the policy level. In terms of internal requirements, the main concerns of existing researches are the adjustment of marine industrial structure, the transformation of new and old kinetic energy, marine ecological protection and marine open economy, etc. However, the research contents are mostly from a macro-perspective, and rarely involve how to achieve the problem.

Further research should pay more attention to the characteristics of China's marine economic development in the period of deep adjustment from high speed to high quality, and guided by the five development concepts. High-quality development aims at achieving the high efficiency, high efficiency, co-ordination, innovation, sustainability, stability, security and sharing of marine economic development. Researchers should deeply interpret the connotation, characteristics and extension of high-quality marine economic development and identifies marine economy. Relationships between high-quality development and the construction of green economy, intelligent ocean, digital ocean, transparent ocean and marine power are also need to be discussed. The functions and objectives of high-quality development of marine economy should be identified. The criteria for evaluating high-quality development of marine economy should be summarized from micro, medium and macro levels.

4.2 Fine evaluation

Research on fine evaluation of high-quality development of marine economy has not been found yet. Current researches mainly focus on the comprehensive evaluation of marine economic development and high-quality development. The comprehensive evaluation of

marine economy mainly focuses on four aspects: the evaluation of comprehensive strength of marine economy, the evaluation of innovation driving capacity of marine economy, the evaluation of sustainable development capacity of marine economy and the evaluation of marine economic performance. At present, domestic scholars pay more attention to the indicators of sustainable development and ecological environment in the evaluation of marine economic development. Researches on the evaluation index system of marine economic development do not take into account the factors of high-quality economic development, while researches on the evaluation index system of high-quality economic development do not consider the special characteristics of marine field. Therefore, in view of the particularity of marine economic development, it is urgent to conduct in-depth study on the fine evaluation of high-quality development of marine economy.

4.3 Path choice

Research into high-quality development path of marine economy are relatively extensive. From the perspective of China's overall development path, they mainly focus on developing new marine industries, enhancing marine scientific and technological innovation capacity, increasing financial support for offshore enterprises, protecting marine ecological environment and balancing regional marine economic development. From the perspective of China's regional development path, the main concerns are to cultivate high-tech industries, foster marine industrial clusters, coordinate the development of land and sea and enhance the ability of scientific and technological innovation. However, the existing literature mostly stays in macro-policy and macro-industry. In order to achieve high-quality development of marine economy, we need to consider the "micro-meso-macro" three-dimensional development path of marine economy driven by "market pull-government push" and explore the specific path choice (Guan *et al.*, 2017).

4.4 Policy mechanism

Research into marine economic development security mechanism mainly involves policy guarantee and financial service guarantee. From the perspective of existing policy guarantee mechanism, the State Council, the Ministry of Land and Resources and the State Oceanic Administration have issued a series of important policies, decisions and measures, which fully demonstrate the importance of the state to the economic and strategic oceans. From the perspective of existing service support, whether it is policy-based financial support or commercial financial support, the support role in high-quality development of marine economy is becoming increasingly obvious. However, the existing literature has not yet generated systematic theoretical results, which cannot effectively support the practice of promoting high-quality development of marine economy, and lacks the institutional design of "concept-system-technology." Therefore, it is urgent to analyze and innovate the guarantee mechanism for promoting high-quality development of marine economy. Such guarantee mechanism and service system should promote the sustainable, stable and healthy development of marine economy.

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