Study on the Cooperation of the Marine Industry in Maritime Silk Road: Based on West Asian & East African Countries

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Abstract: Marine industry cooperation is an important part of building the 21st Century Maritime Silk Road. From the five aspects of marine fishery, marine oil and gas industry, marine engineering equipment manufacturing, marine engineering construction and marine tourism, this paper analyzes the status quo of cooperation between China and 17 countries for the marine industry, and builds a marine industry development level index system, using factor analysis. The study found that the overall level of China's marine industry development is higher than the 17 countries along the line, but in a certain dimension, countries along the line have comparative advantages. The paper proposes strategies for enhancing mutual strategic trust, relying on the construction of economic corridors, establishing consultation and coordination mechanisms, and seeking cooperation opportunities based on complementary advantages.

1. Introduction

At present, research on China's marine industry cooperation along the 21st Century Maritime Silk Road is mainly concentrated in two aspects. The first is a qualitative analysis of the status quo and development strategies of marine industry cooperation between China and countries along the route. The research targets mainly focus on ASEAN countries. Luo analyzed the results of cooperation between China and ASEAN countries in marine fisheries, shipbuilding industry, offshore oil and gas industry, and port cooperation since 2013, as well as the motivations, resistance and development prospects of cooperation between the two parties [1]. Wang studied China and ASEAN countries. The development status of the marine industry points out that the cooperation between the two sides of the marine industry has broad prospects [2]. Yang and Yu analyzed the status quo and development countermeasures of the cooperation between China and Indonesia's marine industry [3]. Some scholars have studied the industrial cooperation between a certain province of China and ASEAN countries. Li analyzed the cooperation between Fujian and ASEAN countries in marine industry [5]. In addition, some scholars have studied countries along the route other than ASEAN countries. For example, analyzed the basis and advantages of cooperation between China and South Africa's marine industry [6]. Ren et al analyzed the actual needs of China and South Africa for marine economic cooperation [7]. the National Development Bank team analyzed China and The status and methods of cooperation between countries along the line in offshore fisheries, offshore oil and gas industry, marine engineering construction industry, offshore engineering equipment manufacturing industry and ocean shipping industry [8].

Based on the above research, the existing researches are mostly limited to the qualitative analysis of the basis, status quo and prospects of cooperation between China and coastal countries in the marine industry. The research objects are mostly concentrated in ASEAN countries. The literature on comprehensive analysis in countries is scarce. The marginal contribution of this paper is to select China and 17 countries (including Lebanon, Jordan, Syria, Palestine, Israel, Saudi Arabia, Kuwait, Qatar, Bahrain, Iraq, Yemen, Oman, United Arab Emirates, Somalia, Djibouti, Ethiopia, Eritrea) as

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The research object covers the West Asia East Africa region along the 21st Century Maritime Silk Road. It summarizes the current status and characteristics of major marine industry cooperation between China and the countries along the route. The factor analysis method is used to measure the marine industry between China and 17 countries along the route. The level of development, and accordingly proposed the cooperation of the marine industry.

2. China's Marine Industry Cooperation on the 21st Century Maritime Silk Road

Cooperation in Marine Fisheries. China's marine fisheries cooperation with countries along the route includes aquatic products trade, offshore fishing, international cooperation and academic exchanges. In the trade of aquatic products, for example, in these 17 countries along the route, China exported 1.699 billion US dollars of aquatic products and imported 906 million US dollars in 2016, an increase of 4.06% and 8.95% respectively compared with 2015 (data from the FAO database).). As China also provides water supply product processing outsourcing services to other countries, and domestic consumption of imported aquatic products is also growing, China's imports of aquatic products are growing rapidly. In terms of offshore fisheries, as of the end of 2016, there were 162 ocean-going fisheries enterprises in the country, with a total output of 1.99 million tons of offshore fisheries; the operational seas involved the Pacific, Atlantic and Indian Ocean high seas, Antarctic waters and the jurisdiction of 42 countries (regions); There are 29 overseas comprehensive bases for offshore fishing with a total investment of more than US$2 million.

2.1. Cooperation in Marine Oil and Gas Industry.

The countries along the 21st Century Maritime Silk Road have always been China's key areas for cooperation in marine oil and gas cooperation. The cooperation has spread throughout Southeast Asia (Burma, Singapore, Thailand, Vietnam, Malaysia, Brunei and Indonesia 7 countries), the Middle East (the Kingdom of Saudi Arabia, Iraq, Kuwait, Qatar, the United Arab Emirates and the Sultanate of Oman, South Asia, Africa (Egypt, Kenya, Nigeria, Algeria, Equatorial Guinea, Gabon, Congo, Angola, Uganda and Madagascar. In 2016, China National Offshore Oil Corporation's overseas crude oil output reached 32.73 million tons, and natural gas production reached 11.57 billion cubic meters. China's marine oil and gas cooperation business with countries along the route includes: First, offshore oil and gas exploration and development, such as the new discovery of the Stabroek ultra-deep water block in Guyana, and the successful evaluation of the deep water gas field in the Preowei-3 well in Nigeria. In 2016, the “Offshore Oil 301” LNG carrier was leased to the Indonesian LNG pontoon project and leased to become the world's first LNG carrier to serve as a floating storage device. The liquid natural gas supplied is used for power generation in local power plants. The cumulative reduction of carbon dioxide emissions in Indonesia is about 1.08 million tons, and the emission of nitrides is halved. It is completely free of sulfide emissions and has significant environmental benefits.

2.2. Cooperation in Marine Engineering Equipment Manufacturing.

In 2014, the sharp drop in international crude oil prices led to the suspension of many offshore oil and gas exploration and development projects. Offshore engineering equipment operators were hit by losses and huge debts, and they actively requested to postpone delivery or even arbitrarily withdraw orders. A large number of offshore engineering equipment under construction was difficult to deliver, and the global offshore engineering equipment market fell into a trough. In 2017, international crude oil prices stabilized and rebounded, and the global offshore engineering equipment market recovered. However, most offshore engineering equipment manufacturers still face a situation of shrinking business, high inventory and difficult profitability. In this international market environment, the total amount of orders for marine engineering equipment undertaken by China in 2017 was US$2.07 billion, down 16.5% year-on-year, and the market share dropped from 47.5% in 2016 to 21.9%. China's advantages in the field of marine engineering vessels are still evident. In 2017, China undertook orders for 29 offshore engineering vessels with a total value of US$1.31 billion, accounting for 54.8% of the total global offshore engineering vessel orders in 2017.

2.3. Cooperation in Marine Engineering Construction Industry.

China's foreign cooperation in marine engineering construction basically covers all countries along the 21st Century Maritime Silk Road. First, the construction and operation of port terminals. Chinese enterprises participate in the construction and operation of port terminals along the country through joint ventures, BOTs, franchise rights, mergers and acquisitions or design and construction (DB) general contracting, such as Gwadar Port, Pakistan, Colombo, Sri Lanka. Nangang International Container Terminal and Port of Hambantota, Span Container Terminal in Mexico, Friendship Port of Mauritania, Port of Bagamoyo, Tanzania, Port of Djibouti, Port of Noatum, Spain, and Banjang Port of Singapore. The second is the construction of a cross-sea bridge, such as the China-Malaysia Friendship Bridge connecting Malé to the airport island of Maldives, across the Jueda Strait, and the Brunei Damora Island Bridge connecting Brunei's western Mora District and the eastern Grand Mora Island.

2.4. Cooperation in Marine Tourism.

The 21st Century Maritime Silk Road provides a broader space for development of China's marine tourism cooperation with countries along the route. In 2017, China's marine tourism industry achieved an added value of 1,463.6 billion yuan, an increase of 16.5% over the previous year. It is the industry with the largest added value and the highest growth rate among the major marine industries. The scale of inbound and outbound tourism continued to expand. In 2017, the income of inbound tourism for international tourists was 125.038 billion US dollars.

3. Measurement of the Development Level of Marine Industry of Maritime Silk Road

3.1. The Construction of the Evaluation Index System.

The system reflects the development level and development potential of a country's major marine industry, and considers the availability, representativeness and objectivity of the data. This paper builds on the basis of the evaluation index system of Li[5]. It includes three primary indicators (Y1), industrial environment (Y2), industrial performance (Y3) and 21 secondary indicators as shown in Table 1.

1). There are seven secondary indicators under the basic conditions, which mainly measure the natural resource endowment and scientific and technological development level of a country. The foundation of a country's development of the marine industry depends on abundant marine natural resources and advanced scientific and technological levels. If there are only abundant marine natural resources, but there is a lack of available science and technology, it is impossible to discover the potential value of marine natural resources, and it is impossible to achieve the flourishing development of the marine industry. As an important strategic resource, oil and gas resources have been fully exploited on land, and countries with strong scientific and technological strength have turned their attention to the development of more difficult and riskier marine oil and gas resources. This paper selects the proved reserves of crude oil and natural gas and the length of the coastline to represent the natural resource endowment of a country; the choice of high-tech products exports accounts for the proportion of manufactured exports, the number of patent applications, the quality index of scientific research institutions and the company's R&D expenditure index.

2). There are six secondary indicators in the industrial environment, which mainly measure the macroeconomic environment and marine industry infrastructure of a country. A good macroeconomic environment provides conditions for the benign interaction between the marine industry and other industries. This paper selects the per capita GDP, the net inflow of foreign direct investment and the added value of manufacturing to reflect a country's economic development level, balance of payments and manufacturing strength. In particular, the quality of information and communication, ports and shipping infrastructure is of great significance to the development of the marine industry. Therefore, this paper selects the ICT Development Index, the Port Infrastructure Quality Index and the Liner Shipping Index to measure the marine industry infrastructure. Among

them, the higher the ICT development index, the better the quality of the information and communication infrastructure; the port infrastructure quality index is 1-7, the higher the value, the better the port infrastructure quality; the higher the liner transport index indicates shipping The more powerful.

3). There are eight secondary indicators under the industry performance, which mainly measure the development achievements and achievements of a country's major marine industries. In view of the availability of data, this paper selects the crude oil production and natural gas production to reflect the development performance of the marine oil and gas industry; the marine aquatic species and marine aquaculture capacity reflects the development performance of marine fisheries; the number of international tourist arrivals and international tourism income reflects The development performance of marine tourism; the throughput of container terminals reflects the development performance of the marine transportation industry; the export of ships reflects the development performance of the marine engineering equipment manufacturing industry.

3.2. Samples and Data Sources.

The research sample of this paper is China and 17 countries along the East and West Africa. The data selected in this paper is 2016 data. The data sources of each indicator are shown in Table 1. Among them, Singapore is a country with scarce oil and gas resources, but it has a strong crude oil processing capacity and is a world-famous refining center. Therefore, Singapore's crude oil production (thousand barrels per day) indicator is replaced by crude oil processing (1000 barrels per day) (The World Energy Statistical Yearbook,2017 BP) to reflect the strength of its offshore oil and gas industry.

3.3. Empirical Analysis.

This paper uses SPSS statistical software to measure the level of marine industry development in China and 17 countries along the route using factor analysis. First, in order to eliminate dimensional and order of magnitude differences, raw data needs to be standardized. The normalized formula is $X'_{ij} = (X_{ij}-X_j) / \delta_j$. Where X'_{ij} is the normalized data, X_{ij} is the original data, X_j is the average of the jth indicator, and δ_j is the standard deviation of the jth indicator. A standardized factor matrix is obtained after standardization[4,6]. In order to enhance the explanatory power of the factor, the information contained in the factor is more prominent, and the maximum variance method is used to obtain the twiddle factor matrix. According to the twiddle factor matrix, four common factors are extracted, and the eigenvalue, contribution rate, cumulative contribution rate and inclusion index of each common factor.

We analyze the overall level of marine industry development in a country from the perspective of comprehensive scores. Among the 17 countries selected in this paper, China's comprehensive score ranked first, indicating that China's marine industry has the highest overall level of development, whether it is marine fisheries, aquaculture, or offshore engineering equipment manufacturing, all types of marine industries. There are different degrees of development. Although the United Arab Emirates is a country with scarce natural resources, its advanced science and technology, excellent infrastructure, and developed shipping system have obvious advantages in the high value-added marine industry, ranking second in overall scores. The marine oil and gas industry in the Kingdom of Saudi Arabia and Qatar is its dominant industry. The high per capita income level, sound infrastructure and strong research and development capabilities constitute the basis for the development of the marine industry. The overall score is ranked 3rd and 4th. Somalia, Djibouti, Ethiopia, and Eritrea have a poor overall score, but this does not mean that these countries lack marine resources, but lack the technology and funds to turn marine resources into products and services.

Table 1 Scores (s)and rankings(r) of marine industry development levels in china and 17 countries

Country	Development performance		Development foundation		Oil and gas resources		Natural environment		sum	
	S	R	S	R	S	R	S	R	S	R
Jordan	-0.47	14	-0.49	12	-0.75	18	-0.21	17	-0.41	14
Syria	-0.33	8	-0.48	11	0.19	13	-0.28	18	-0.38	13
Palestine	-0.38	11	-0.02	6	0.32	10	0.25	4	-0.33	11
Israel	-0.19	5	1.81	1	-0.63	16	0.37	3	0.08	5
Saudi Arabia	0.01	2	-0.01	5	2.74	1	-0.19	10	0.33	2
Kuwait	0.02	3	-0.47	10	0.64	5	-0.91	16	-0.23	8
Qatar	-0.29	6	1.66	2	1.67	2	0.84	1	0.3	3
Bahrain	-0.31	4	0.29	4	-0.31	14	-0.76	14	-0.17	6
Iraq	-0.31	7	-0.03	7	0.69	4	0.24	5	-0.26	9
Yemen	-0.35	9	-0.05	8	-0.35	15	0.07	7	-0.22	7
UAE	-0.1	1	1.31	3	0.78	3	-0.83	15	0.27	4
Somalia	-0.41	12	-0.59	18	0.39	8	0.45	2	-0.45	16
Djibouti	-0.49	15	-0.51	13	0.29	11	-0.23	11	-0.51	18
Ethiopia	-0.36	10	-0.53	15	0.4	7	-0.13	7	-0.43	15
Eritrea	-0.51	16	-0.55	16	-0.71	18	-0.35	12	-0.49	17
Oman	-0.44	13	-0.52	14	0.27	12	-0.01	9	-0.36	12
Lebanon	-0.56	17	-0.56	17	0.38	9	0.14	6	-0.31	10
China	4.85	1	-0.14	9	0.41	6	0.09	8	2.08	1

4. Conclusions

The ocean is an important strategic space for a country. The marine industry is the most promising strategic industry in the 21st century. Therefore, the cooperation between China and the coastal industries should build a partnership from the height of national strategic cooperation. The overall level of marine industry development in the countries along the route is lower than that in China, but it has comparative advantages in different dimensions or a certain marine industry. Therefore, China's cooperation with marine industries along the line should be coordinated and complement each other to achieve a wider space of marine resources. Effectively deploy and promote the cooperation of marine industry to more fields and deeper levels. Enhance strategic mutual trust and establish a strategic partnership for marine industry. Relying on the construction of economic corridors, expanding the space for cooperation in marine industry. Establishing a consultation and coordination mechanism to provide protection for the cooperation of the marine industry

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References

[1] Luo Yongkun, Cooperation between China and Southeast Asian countries in marine industry, International Research Reference, vol.2, 2018, pp.30-36.

[2] Wang Qin, National-ASEAN Marine Economic Development and Cooperation: Current Situation and Prospects, Southeast Asia, vpl. 6, 2016, pp.36-38.

[3] Yang Chengling, The development of Indonesian marine economy and its cooperation with China, Asia-Pacific Economics, vpl.2, 2015, pp.69-72.

[4] Yu Zhenyan, China-Indonesia Ocean Economic Cooperation under the Strategy of 21st Century Maritime Silk Road, Opportunities and Challenges, Strategic Decision Research, 2017, pp. 61-81.

[5] Li Nan, Current Situation and Motivation of Marine Economic Cooperation between Fujian Province and ASEAN, Journal of Xiamen University of Technology, vpl.2, 2017, pp.28-32.

[6] Zhu Nian, Li Yi. Research on Marine Industry Cooperation between Guangxi and ASEAN Countries, Journal of Nanning Vocational and Technical College, vol. 2, 2016, pp.27-31.

[7] Deng Zhuopeng, Luo Chunxiang, Research on Tourism Cooperation between Hainan and ASEAN under the Background of One Belt, One Road, Value Engineering, vol.17, 2017, pp.237-239.

[8] Wang Wensong, Zhu Tianqi, Liu Wei, Analysis of the prospect of marine economic cooperation in South Africa, China, Open Financial Research, 2017, pp.78-89.