Research on the present situation and development of Yantai Marine pasture

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Abstract. Yantai City is in the East coast of China, with rich Marine resources and superior geographical position, is one of the important Marine aquaculture bases in China. This paper discusses the present situation and development trend of Marine pasture in Yantai city. First, this paper analyzes the current situation of Marine pasture in Yantai city. From the status quo, at present, the Marine pastures in Yantai city mainly take seaweed, shellfish and fish as the main breeding varieties. However, with the increase of population and the improvement of living standards, the market demand is also increasing, so the scale and output of ocean farms are also increasing. Then, this paper puts forward some suggestions on the development of ocean pasture in Yantai City. It is suggested that the government departments should strengthen the standardized management and technological innovation of ocean pastures, and encourage enterprises to strengthen brand building and expand marketing channels to improve product quality and market competitiveness. In addition, exchanges and cooperation with Marine ranches at home and abroad should be strengthened to promote the sustainable development of the Marine ranching industry. In short, the Marine ranching industry in Yantai has broad prospects for development, but it also needs the joint efforts of the government and enterprises to solve the current problems and promote the development of the Marine ranching industry in Yantai to achieve a higher quality.

Keywords: Marine Pasture, Yantai, Current Situation, Development, Suggestions.

1. Introduction

1.1. Research background and significance

1.1.1. Research background

The ocean is of strategic significance to China's economic development, which contains rich Marine resources and is an inalienable supply of resources for human beings. As a large maritime country, faced with the continuous growth of the global population, the shortage of land food, the degradation of Marine fishery resources caused by overfishing, sea water resources pollution and other problems, the traditional mariculture model has been unable to meet the requirements of China's Marine economic development, and Marine pasture aquaculture provides an effective way to solve the above problems. [1]According to this plan, Marine fishery in Shandong province is in urgent need of a new round of industrial upgrading. This paper focuses on the current situation of Marine ranches in Yantai City, understands the shortcomings of Marine ranches in Yantai City, combines the development of other Marine ranches at home and abroad, summarizes the questionnaire data information, explores the current situation of Marine ranches in Yantai City and provides development suggestions.

1.1.2. Research significance

This paper can make up for the deficiencies in the development of Marine pastures in the Marine economy field of Yantai City, expand the content of high-quality development of Marine economy, and promote the solution of related problems.

This paper analyzes the problems existing in the development of Marine pastures in Yantai city from the perspective of Yantai citizens, uses the results of literature and questionnaires to analyze the problems, breaks through the traditional thinking mode and studies the solutions from the perspective

of tourists, so that the investigation and analysis of the current situation of Marine pastures can be carried out from a new Angle, which is conducive to further expanding the research on the further development of Marine pastures. To improve the development status of ocean pastures and promote the development of Marine economy. This paper can provide reference for the relevant management personnel, so there is a certain practical significance.

1.2. Research purpose and content

1.2.1. Research purpose

This paper aims to explore the status quo and development suggestions of Marine ranches inYantai City, combine the existing theoretical research results and compare the development achievements of other Marine ranches at home and abroad, design a questionnaire of Yantai citizens' understanding of Marine ranches, conduct data analysis and research, understand the status quo of Marine ranches in Yantai city from multiple dimensions, and truly understand the shortcomings of Marine ranches. Put forward targeted suggestions from multiple dimensions to promote the high- quality development of Marine economy in Yantai City and build a green and sustainable Marine ecological environment.

1.2.2. Research content

The first is to sort out the theories and literature researches on Marine pastures at home and abroad, and fully understand the existing research ideas, methods and results. Do a good job of knowledge reserve for the in-depth study of this paper.

Second, through the analysis of questionnaire data, suggestions from relevant personnel and the comparison of Marine pastures at home and abroad, the status of Marine pastures in Yantai City is accurately positioned, and the main problems of Marine pastures in Yantai city are summarized.

The third is to combine the problems of Yantai Ocean ranch and domestic policies, and put forward targeted suggestions.

1.3. Research Methods

(1) Literature research method

Through the combination of library, archives, CNKI, Baidu Baike and other online and offline channels, I consulted the relevant materials of ocean pasture, collected relevant information, classified and sorted many journal papers, followed the research progress in the field of ocean pasture, and explored the theme of the current situation and development of ocean pasture, laying a solid foundation for the implementation of this research.

(2) Field study method

Through the field investigation of Shanhai Ocean Star, experience the service quality of its various projects, better provide the projects to be developed for Shanhai Ocean Star, combine theory and practice, take Shanhai Ocean Star as the starting point to deeply understand the development status of Yantai Ocean ranch, provide facts and evidence for the research, to get more practical development opinions.

Combining the above two methods, this paper summarized the development status quo and existing problems of Marine pasture in Yantai City, combined with relevant theoretical knowledge and experience of Marine pasture in other areas, put forward opinions and suggestions on the development of Marine pasture in Yantai City, and provided theoretical support for building a demonstration city of Marine pasture in Yantai City and promoting industrial transformation and upgrading. At the same time, it provides theoretical reference for different provinces and cities in China to build environment-friendly new fishery industry model, and provides new construction ideas in environmental protection and the development of Marine blue economy.

1.4. Literature Review

1.4.1. Exploration on the development of Marine pastures abroad

The prototype of the sea ranch can be traced back to 1795 in Japan, where fishermen made simple fish reefs and put them into the sea, using the fish collecting effect to significantly increase [2] 1853 the number of fish caught. With the development of industrial Revolution, the United States, Norway, Britain and other western countries pay more attention to industrial development and economic benefits, Marine fishery resources are gradually declining due to pollution, in order to alleviate this crisis, the United States and other western countries launched the "Marine fish hatching movement", releasing a large number of young fish, so that they can feed on natural food in the Marine environment, and then catch them again. This improved the quantity and quality of seedling cultivation, which also laid the foundation for the birth of the United States Marine ranching. Different from the development of Marine farms in Japan, the construction of Marine farms in the United States is mainly promoted by fishermen and enterprises. In 1935, a private Marine fishing organization in the United States built the world's first artificial fish reef to increase fishing volume. Japan began to produce reinforced concrete artificial reefs [3] in the mid-1950s. The idea of a sea farm was first proposed by Japan in 1971. In 1972, the United States built a sea ranch [2] 1854of giant algae in the waters of California. From 1978 to 1987, Japan began to comprehensively promote the "cultivated fishery" plan throughout the country, and the world's first Marine ranch -- Kuroshio Ranch was [4] also built. The Marine farm has various functions. First, its basic facilities are composed of Seine nets and large fishing nets. The purpose is to capture the farmed Marine organisms in a controllable range for breeding, which opens a new way for the development of fishery economy based on artificial management. Another more important function of the Kuroshio Marine farm is to provide a sustainable fishing method for Japan's offshore fisheries and effectively maintain the sustainable use of aquatic resources. The above is the preliminary exploration stage of the Marine farm, which aims to promote the development of Marine economy in various countries and pays less attention to Marine ecological benefits. Since then, it has entered the stage of large-scale development, and the construction of Marine ranches is mainly based on artificial reefs and breeding and exile, focusing on the economic benefits of Marine ranches. After the 1990s, the development of Marine ranches in Japan entered the stage of large-scale development, mainly because the Japanese government took the construction of artificial reefs as a national undertaking and invested 60 billion yen in the construction of artificial reefs. At the same time, it also paid attention to the planning of reef construction, rationally arranged the site of reef construction and improved the design of reefs. The investment of these research costs also led to the rapid development of Japan's reef construction technology. In 1999, Japan developed a high-rise reef [5] 142with a height of 30cm. The United States followed closely in the construction of artificial reefs along the coast of the country, taking the construction of artificial reefs as an important part of national fishery development, and the large-scale development of Marine pastures. In 1973, South Korea began to build artificial reefs on a large scale, and established the national aquatic seed breeding farm. At the end of the 20th century, through the feasibility study of artificial reefs, proliferation and release in the Korean coast, the Korean government formulated the long-term development plan of the Korean Marine farm, under the guidance of the plan began to establish Marine farms, and the development of Marine farms pursued speed. By the year 2000, 18, 542 hectares of artificial reef area had been built in South Korea, which shows the speed of development of Marine ranching [5] 142. Since the 21st century, because of the realization that the 21st century is the century of the ocean, the governments of various countries have issued relevant laws and regulations to standardize the development of Marine pastures, and pay equal attention to both economic and ecological benefits. The function of artificial reefs has changed from a single function of attracting fish to the conservation of Marine pastures resources and the maintenance of ecological environment. Japan has standardized and promoted the construction of ecological Marine pastures through legislation and other means, to pay equal attention to economic and ecological benefits. At this stage, the research on Marine pastures in Japan has also expanded from shallow sea areas to deep water areas, reflecting the high level of aquaculture and fishing

capacity. The development results of Marine pastures in Japan have strongly proved to us that Marine pastures can effectively maintain the growth of fishery resources. To conserve the Marine ecological environment. In recent years, the rise of Marine ranches in the United States is mainly dominated by recreational fisheries, to attract fishing enthusiasts to expand their popularity and ensure that the benefits of Marine ranches continue to increase, which is closely related to the social concept of pursuing enjoyment, high-level manufacturing industry and developed economy. In 2008, South Korea put forward a plan to strengthen the construction of seaweed farms, and planned to build a total of 35,000 hectares of seaweed farms by 2030 to restore the coastal ecosystem. In 2012, the Aquatic Resources Management Law was revised to regulate the development of seaweed farms at the legal level, and Marine farms are developing in the direction of institutionalization and ecology with high quality. At the same time, May 10 of each year is set as Marine Tree Planting Day, which improves the Korean people's awareness of and participation in the construction of Marine farms and seaweed farms, and provides a good social atmosphere [6]for the construction of Marine farms.

1.4.2. Research on the development of Marine farms in China

The idea of Marine pasture in China can be traced back to 1947, when Chinese Marine biologist Zhu Shuping first proposed that "water is the pasture for fish" and advocated "breeding fish and developing aquatic pasture"[7]. In 1970, Academician Zeng Chengkui put forward the idea of Marine pasture construction, and implemented "Marine farming and her [8] ding" in China's coastal waters. In 1979, Guangxi Fisheries Department put China's first concrete artificial fish reef in Beibu Gulf, which started [9] the construction of Marine pasture in China. From 1981 to 1988, a large number of artificial reefs were put into the coastal provinces of China, which achieved great results, alleviated the shortage of fishery resources, repaired the ecological environment, and developed the Marine pasture at a high speed [10]. In the 21st century, all coastal provinces and cities have made full use of their geographical advantages and Marine resources to build artificial reefs and algal farms, linking the construction of Marine pastures with the restoration of fishery resources, the repair of ecological environment, the development of tourism and the improvement of economic benefits, and realizing the new development of Marine pastures. Shandong Province began to implement the Fishery Resources Restoration Plan of Shandong Province in 2005, and carried out the construction of artificial reefs in the coastal areas of the province, and achieved good results, which has played a demonstration role in the construction of Marine pastures in the country. At the same time, Marine pastures are also faced with many problems, such as: relatively single development mode, insufficient cultural innovation and development, service quality to be improved, insufficient publicity, etc., which affect the comprehensive benefit s [10] of Marine pastures to a certain extent. Based on summarizing the research results of Marine pastures at home and abroad and the research and development results of the team, Chen Yong put forward the concept and technical system of "modern Marine pastures" according to the current situation of Marine pastures in China and the development trend of fishery. The development of Marine pastures in China should realize the transformation from high speed to high quality, and realize the transformation of Marine fishery production mode [12] 148 from consumption of aquatic resources to resource management. In 2017 and 2018, the No. 1 Central document clearly proposed to "develop modern Marine pastures" and "build modern Marine pastures", and in 2019, the No. 1 Central document further emphasized the need to "promote the construction of Marine pastures"[5] 142. Yantai City actively responded to the call of the government, the development of Marine pastures in the forefront of the country, to the sea for food, Yantai from fish breeding, to far-reaching Marine aquaculture, in the construction of Marine pastures out of a shallow to deep blue road. There have been about 10 large-size fish breeding bases built in Yantai, which can provide more than 20 million large-size fish seedlings annually. At the same time of breeding fish seedlings, Yantai has also invested in large-scale and far-reaching Marine aquaculture equipment, which has greatly improved the safety, benefit and efficiency of Marine pasture farming. Yantai actively carries out the first trial of Marine pasture, taking the lead in the country to build 24 far-reaching Marine aquaculture facilities such as semi-submersible and jack-up multi-functional platforms for Marine pasture, far-reaching sea intelligent cages, pipe piles and large Seine nets, and

18 ocean pasture platforms. Up to now, the city has built 46 Marine ranches above the provincial level, of which 20 are national-level, accounting for about 1/8 of the country, ranking first in the country's prefecture-level cities.

2. Overview of Yantai Marine ranches

2.1. Overview of Yantai Ocean pasture

Yantai is in Shandong Peninsula, East coast of China, with relatively superior natural conditions, extended coast and island coastline, rich fishery resources, adjacent to Yantai Port or other ports, and convenient transportation. Yantai is a city rich in Marine resources. At present, Yantai has built 46 Marine ranching demonstration zones above the provincial level, of which 20 are national demonstration zones, accounting for about one-eighth of the country's Marine ranching, and the number is the first among prefecture-level cities in the country. The sea pastures in Yantai City have a variety of species, including shrimp, crab, shellfish, fish and so on. Among them, shrimp and crab farming is more common, such as green shrimp, prawns, hairy crabs, river crabs and so on. In addition, shellfish farming is also very common, such as oysters, scallops, clams, etc. Fish farming is relatively rare, but there are small parts of it, such as bass, pomfret, etc. At present, the development level of Marine pastures in Yantai is relatively high, and a series of modern aquaculture technologies and management methods have been adopted, such as intertidal aquaculture, cage aquaculture, deep-water aquaculture, and professional aquaculture cooperatives, which have achieved double improvement of aquaculture and ecological benefits. At the same time, the Marine pastures have also strengthened the quality control and supervision of products, carried out the whole quality control from breeding to marketing, and improved the quality and safety of aquatic products. In general, the development of Marine pastures in Yantai is in good shape, providing an important guarantee for local economic development and the supply of aquatic products.

2.2. Assessment of ecological environment status of Marine pastures in Yantai City

The ecological environment assessment of Marine pastures in Yantai City is an important issue, which needs to consider many factors. According to the data and research report released by Yantai Marine Fisheries Bureau, the following is the assessment of the ecological environment status of Marine pastures in Yantai:

(1) Water quality: The sea pastures in Yantai City are located at the junction of Bohai Bay, Yellow Sea and East China Sea, and the water quality is affected by many factors. In recent years, Yantai Marine Fisheries Bureau has strengthened the monitoring and management of water quality, and continued to optimize the water quality and improve the quality of the ecological environment of Marine pastures while maintaining the qualified level.

(2) Marine ecosystem status: Because Yantai Marine pasture is close to the natural Marine ecosystem, its ecological environment has a very important impact on the Marine ecosystem. The management of Marine pastures in Yantai adopts a scientific, standardized and sustainable management model, which is very beneficial to the protection of Marine ecosystems. At present, the scale of reef investment in the Marine pasture demonstration zone exceeds 3.5 million, and more than one billion units of various aquatic species are multiplied and released every year. Some algae and demanding aquatic organisms not seen for many years have increased, effectively maintaining the stability and biodiversity of aquatic organisms.

(3) Waste disposal status: A large amount of waste will be generated in the production process of ocean pasture, such as residual bait and feces. If not handled properly, these wastes will have a negative impact on the Marine ecological environment. At present, Yantai's Marine farms use sustainable waste treatment methods, such as aerobic treatment and sedimentation tank treatment, to ensure that the waste does not pollute the environment.

To sum up, the ecological and environmental status assessment of Marine pastures in Yantai is relatively good overall, but it still needs to continue to strengthen monitoring and management to ensure the sustainable development of Marine pastures.

2.3. Development dynamics of Marine pastures in Yantai City

(1) Government policies and supporting measures

To promote the development of Marine pastures in Yantai City, the government has introduced several policies and support measures. The following are some specific examples: (1) Financial support: The government provides certain financial support for the construction of Marine pastures. For eligible ocean ranch projects, the government can provide them with loans, capital subsidies, tax relief and other preferential policies. For example, live fish raised by oneself can enjoy tax exemption if they are sold directly, which greatly reduces the burden of investment. According to statistics, in 2023, the tax exemption policy for maritime fisheries will be more than 20 million yuan, which shows the great support of the government. (2) Subsidy policy: The government will also provide a certain number of subsidies for eligible Marine ranching projects. For enterprises that build or expand Marine pastures, the government can give subsidies to encourage them to actively develop Marine animal husbandry. (3) Market development: The government will encourage enterprises to actively explore overseas markets, such as participating in international fishery fairs, to provide enterprises with a broader space for development. (4) Resource development: The government will actively promote the development and utilization of Marine pasture resources, including promoting scientific and technological innovation, carrying out scientific research cooperation, and building scientific research platforms. (5) Policy guidance: the government will provide certain policy guidance on the planning, construction and management of Marine ranches, encourage enterprises to operate legally and in compliance with regulations, and jointly promote the sound development of Marine animal husbandry. (6) Policy support: Yantai Government provides a series of relevant laws and regulations to support the development of Marine ranching, so that Marine ranching has a "legal identity". All in all, the government can provide a variety of policies and support measures for the Marine ranches in Yantai, stimulate the vitality of the development of enterprises, and promote the rapid development of Marine animal husbandry.

(2) Application of new technology and innovation

The ocean ranch of Yantai City has been actively exploring the application of technology and innovation, and constantly trying new technical means and innovative application methods. (1) Intelligent management: Ocean ranch adopts intelligent management mode, introduces technologies such as Internet of Things, cloud computing and big data, and realizes fine management of aquaculture environment, water quality and water temperature by means of real- time monitoring and data analysis. (2) Biological breeding: The Marine ranch carries out biological breeding for a variety of seafood, such as prawns, sea crabs, lobsters, etc., to optimize the variety characteristics and improve the breeding efficiency. (3) Photosynthesis technology: The Marine pasture uses photosynthesis technology to directly convert light into protein and other nutrients, effectively improving the quality and yield of seafood. (4) Application of artificial intelligence: The Marine ranch introduces artificial intelligence technology, and realizes the comprehensive monitoring of the breeding process through the functions of machine vision, natural language processing and so on, and improves the breeding efficiency and production quality. (5) Unmanned ship technology: The ocean ranch adopts unmanned ship technology, and the unmanned ship is used in the monitoring, transportation, sampling and other links in the breeding process, which improves the production efficiency and safety. To sum up, the ocean ranch in Yantai City has continuously explored and practiced in the application of new technologies and innovations, and has achieved a lot of results in the aspects of efficiency, intelligence and sustainability, which has promoted the development of Marine animal husbandry.

(3) Domestic and foreign market demand and development trend

At present, the domestic market has an increasing demand for seafood, while consumers have higher and higher requirements for product quality and food safety. Therefore, Marine pastures need to continuously improve product quality and production standards, adapt to market demand, meet consumer demand, to obtain better market competitiveness. With the development of the global economy and the improvement of people's living standards, the demand for seafood in the international market is also increasing. Marine farms need to understand the market needs and standards of various countries, improve product quality and reduce costs through innovative technology and management methods, to meet the needs of the international market.

The development trend of Marine animal husbandry is efficient, intelligent and sustainable. In terms of efficiency, Marine ranching needs to constantly explore new technologies and management methods to improve production efficiency and cost-effectiveness; In terms of intelligence, ocean pastures need to introduce advanced technologies such as the Internet of Things, big data and artificial intelligence to realize intelligent management and comprehensive monitoring of the breeding process; In terms of sustainability, ocean ranches need to actively explore sustainable development models, protect the ecological environment and promote sustainable development.

In general, with the intensification of market competition and the continuous updating of technology, the ocean pastures in Yantai need to carry out continuous technological innovation and market development to adapt to the needs and development trends of domestic and foreign markets.

3. Results and discussions

3.1. Prospects

As an important city on the east coast of China, Yantai is blessed with unique Marine resources and a beautiful Marine environment. With the development of the national Marine economy and people's pursuit of healthy diet in recent years, the Marine ranching industry has gradually emerged in Yantai city and has a good development prospect.

First, the Marine ranching industry in Yantai City has a huge market demand. With the improvement of people's living standards and the pursuit of healthy diet, the consumption demand of seafood is increasing. As a new way of seafood farming, Marine pasture has been favored by more and more consumers and the market demand is gradually expanding.

Secondly, the Marine ranching industry in Yantai City has good conditions for development. Yantai has unique Marine resources and rich Marine ecology, which is suitable for the cultivation and breeding of a variety of Marine organisms. In addition, the Yantai municipal government also attaches great importance to the development of Marine economy, and has increased its support and support for the Marine ranching industry. At the sametime, it has also made a lot of efforts to protect the Marine environment and Marine ecology, providing a strong guarantee for the development of the Marine ranching industry.

Finally, the Marine raanching industry of Yantai city also has good innovation and development potential. The Marine ranching industry is a new industry, which is still in the early stage of development. With the continuous improvement of technology and the constant change of market demand, the Marine ranching industry is also constantly innovating and developing, and there will be more new technologies, new varieties and new products in the future, which provides a strong support for the long-term development of the industry.

To sum up, the Marine ranching industry in Yantai city has broad prospects for development. The government and enterprises should cooperate closely to increase support and support for the industry, improve the competitiveness and influence of the industry and promote the rapid development of the Marine economy through means such as technological innovation, market expansion and brand building.

3.2. Suggestions

(1) Promote the standardized construction of Marine pastures. Government departments should formulate corresponding plans and policies, guide enterprises to build Marine pastures in accordance with the requirements of standardization and standardization on the basis of the Fisheries Law of the People's Republic of China, the Water Pollution Prevention Law of the People's Republic of China, the Marine Environmental Protection Law of the People's Republic of China and other laws, and strengthen the management and supervision of environmental protection and product quality in the process of aquaculture. In addition, the development of Marine pastures should follow the objective laws of economy and not be rushed.

(2) Strengthen technological research and development and innovation. The Marine ranching industry is a technology-intensive industry, which needs to continuously strengthen technological research and development and innovation to improve breeding efficiency and product quality. The government and enterprises should jointly invest more resources and funds to enhance technological innovation and personnel training. In view of the large capacity of independent innovation, a senior research team for Marine pastures should be established, high-quality Marine science and technology talents at home and abroad should be hired, and experience should be exchanged with high-level Marine pasture construction institutions abroad to draw a blueprint for the development of Marine pastures in our city.

(3) Develop brand and marketing channels. The competition of ocean ranch lies not only in product quality and price, but also in the construction of brand and marketing channels. Ocean ranch-related enterprises seek to co-name with classic ocean series movies, expand consumer masses and improve their own visibility. At the same time, the government and enterprises should make joint efforts to create a brand with popularity and reputation, and establish diversified sales channels to expand market share.

(4) Strengthen cooperation and exchanges. The government and enterprises should strengthen cooperation and exchange, absorb and utilize the experience of foreign Marine ranching construction, establish a cooperation mechanism integrating production, learning and research, introduce advanced technology and management experience at home and abroad, and jointly promote the upgrading and development of Marine ranching industry.

(5) Protect the Marine ecological environment. The development of the Marine ranching industry depends on the stability and health of the Marine ecosystem. The government and enterprises should strengthen the protection and management of the Marine environment, reduce the impact on the Marine environment in the process of aquaculture, and ensure the sustainable development of the industry.

(6) Optimize the breeding structure. Select high-quality varieties for breeding, enrich the variety structure of Marine pastures, build a stable and reasonable food chain structure of Marine pastures, maximize breeding efficiency and improve product quality, to improve economic benefits.

4. Conclusion

The impact of human activities on the Marine ecological environment is increasingly strong, especially the recent Japanese nuclear sewage discharged into the sea despite the protests of the world, which makes the Marine ecological environment seriously threatened. The research of this paper is of great significance to the repair of the Marine ecological environment and the conservation of fishery resources. Based on a solid theoretical basis, this paper studies the Marine ranches of Yantai City. According to the status of Marine ranches in Yantai City, this paper proposes new ideas suitable for the development of Marine ranches in Yantai City through the methods of literature research and questionnaire survey. Under the premise of protecting Marine ecological environment, technological research and development and innovative means are adopted to coordinate the interoperability of economic and ecological benefits. At the same time, develop brand and marketing channels, strengthen cooperation and exchanges with foreign Marine ranches, maximize their role in repairing

Marine ecological environment and conservation of fishery resources, and serve the sustainable development of human society.

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